THE USE OF WEB 2.0 BY STUDENTS AND LECTURERS AT MZUZU UNIVERSITY, MALAWI: THE CASE OF THE FACULTY OF INFORMATION SCIENCE AND COMMUNICATIONS

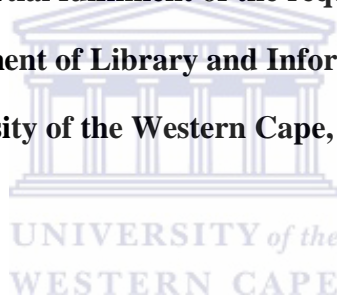## WINNER DOMINIC KATAYIRA CHAWINGA

3371323

A mini-thesis submitted in partial fulfilment of the requirements for the MLIS degree

in the Department of Library and Information Science,

University of the Western Cape, Bellville

Supervisor Dr. Sandy Zinn (UWC)

NOVEMBER 2014

DECLARATION

"I declare that the mini-thesis **The use of Web2.0 by students and lecturers at Mzuzu University, Malawi: the case of the Faculty of Information Science and Communications** is my own work, that it has not been submitted before for any degree or assessment in any other university, and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references".

Candidate: **Winner D. Chawinga**   **Signature:**   Date: 14/11/2014

Supervisor: **Dr. Sandy Zinn**   **Signature: …………………….. Date…………………**

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DEDICATION

I dedicate this work to my parents: my late father Boneck Katayira Chawinga and Mrs. Beatrice Chawinga.

I also dedicate this work to my uncle; Mr. Henry Mwilwa Mukumbwa. You are such a wonderful uncle.

ACKNOWLEDGEMENTS

ABSTRACT

The aim of the study was focused on investigating how Web 2.0 technologies are being utilised by students and lecturers to accomplish their learning and teaching activities in the Faculty of Information Science and Communications (ISC) at Mzuzu University in Malawi. The study answers the following specific research questions:

- What is the current awareness of and familiarity with Web 2.0 technologies amongst students and lecturers in the Faculty of ISC?
- For what educational purpose do students and 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 integrating Web 2.0 technologies in teaching and learning?
- What are the factors that influence students and lecturers in the Faculty of ISC to adopt Web 2.0 technologies?

The study adopted the Decomposed Theory of Planned Behaviour (DTPB) by Taylor and Todd (1995) which explains the rejection and acceptance of technological innovations such as Web 2.0. The researcher adopted a case study design in which both qualitative and quantitative data were collected to answer the research problem. The study was conducted in three phases; in phase one, a questionnaire was sent to 186 students and 19 lecturers, phase two involved analysing the curricula and phase three involved conducting follow-up interviews with seven lecturers to seek clarification on some concepts and elaboration on themes identified in phases one and two. The findings show that between 69 (50.7%) and 128 (94.1%) students use these Web 2.0 technologies to search for information, to communicate with lecturers, to submit assignments, to communicate with friends on academic work and to share content with fellow students. Most lecturers use these technologies in handing out assignments to students, receiving feedback from students, uploading lecture notes, searching for content, storing lecture notes and carrying out collaborative educational activities. Between 66 (45.8%) and 95 (69.9%) students use Wikipedia, WhatsApp, Google Apps and YouTube and similarly, between 10 (58.8%) and 13 (76.5%) lecturers use Wikipedia, YouTube, Blog, Google Apps and Twitter to accomplish various academic activities. The findings show further that attitude (perceived usefulness, ease of use and compatibility) and perceived behaviour control (self-efficacy, resource facilitating condition and technology facilitating condition) are strong DTPB factors that determine students' and lecturers' intention to integrate Web 2.0 technologies in their academic activities. On the other hand, lack of Internet access remains the recurrent key stumbling blocks towards a successful adoption of Web 2.0 technologies in learning and teaching at Mzuzu University (MZUNI).

Generally, the study reveals that Web 2.0 and a compendium of Internet technologies have proliferated at Mzuzu University in the Faculty of ISC. Both students and lecturers are aware, to some extent, of the benefits of integrating Web 2.0 in teaching and learning. The researcher has

made three main recommendations which include the need for the Faculty of ISC to introduce awareness and training programmes on the new technologies so that students and lecturers are kept up-to-date about the new developments about these technologies, the need for the newly established Directorate of ICT at MZUNI to promote the use of Web 2.0 technologies by conducting work workshops and sourcing funds for students and lecturers to participate in local and international conferences on Web 2.0 and finally, the need for Mzuzu University to install campus–wide Wi-Fi so that students and lecturers can seamlessly access the Internet on every point of the campus using mobile phones or laptops.

Key words: Decomposed Theory of Planned Behaviour, Education, Learning, Malawi, Mzuzu University, Teaching, University, Web 2.0.

LIST OF ACRONYMS AND ABBREVIATIONS

DTPB   :   Decomposed Theory of Planned Behaviour

ICT   :   Information and Communication Technology

ISC   :   Information Science and Communications

ITU   :   International Telecommunication Union

LIS   :   Library and Information Science

LUANA   :   Lilongwe University of Science and Technology

MACRA   :   Malawi Communications and Regulatory Authority

MTL   :   Malawi Telecommunications Limited

MUST   :   Malawi University of Science and Technology

MZUNI   :   Mzuzu University

RSS   :   Real Simple Syndication

SPSS   :   Statistical Package for the Social Sciences

UNESCO   :   United Nations Educational, Scientific and Cultural Organization

UNISA   :   University of South Africa

UWC   :   University of the Western Cape

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CHAPTER ONE

INTRODUCTION

1.1. Introduction

The study set out to investigate the adoption and use of Web 2.0 technologies in teaching and learning at the Faculty of Information Science and Communications (ISC) at Mzuzu University (MZUNI) in Malawi. The study resulted from the researcher's three-year experience as a Staff Associate in the Department of Library and Information Science (LIS) which is one of the departments under the Faculty of ISC. The researcher was concerned about the uncertainty over the use of Web 2.0 technologies in teaching and learning by students and lecturers. This chapter introduces the whole study by discussing the background and rationale, contextual setting, problem statement, aim of the study, research questions, theoretical framework, significance of the study, scope and an outline of the thesis.

1.2. Background and rationale

In the 21st century, countries across the globe are increasingly relying on Information and Communication Technologies (ICTs) to address a wide range of issues. Video conferencing, e-banking, e-government, e-learning and mobile technologies are some of the ICT hypes and promises that have triggered processes of change in both, the public and private sectors. The term 'ICT' is used almost interchangeably with the Internet (Beebe, 2004). The Internet is an interconnected network of networks and it helps to connect millions of computers and millions of users around the world (Tatnall *et al.*, 2003). The Internet together with its applications has proved to be a remarkably convenient, cheap and affordable avenue in bringing people together where they share data, information and knowledge thereby enlarging the range of human capabilities.

Advancements in ICTs have profoundly revolutionised higher education especially the delivery and presentation of lectures. Windschitl (1998) had 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 Web would not only function as 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 teaching and learning styles are displacing the traditional ones. 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.

The challenge however is that in 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. In fact, what Windschitl (1998) had predicted is now a reality: the recent emergence of Web 2.0 technologies affords students and lecturers an absolute opportunity to instantly create, share, distribute and search educational content. Fundamentally, today's youth, particularly students, are increasingly becoming creative, interactive and media oriented. Smart phones, computers, laptops and other ICT gadgets, which are used to connect to the Internet, are now affordable and prevalent amongst students and lecturers. Such developments have prompted some researchers (Greenhow, Robelia & Hughes, 2009) to underscore the need to re-examine the role of the Web in teaching and learning.

A number of studies (Greenhow, Robelia & Hughes, 2009; Kadzera, 2006; Nyirongo, 2009; Zinn, 2009) have thus concluded that the adoption of the emerging Internet technologies can enhance teaching and learning. So far, it seems it is only Kadzera (2006) and Nyirongo (2009) who have conducted studies related to the use of ICTs in teaching and learning in Malawi. The former investigated the use of instructional technologies in teacher training colleges in Malawi while the latter endeavoured to investigate the adoption and integration of instructional technologies by lecturers at MZUNI. Thus, they did not explicitly or implicitly investigate how Web 2.0 technologies have been adopted and assimilated in Malawian universities. An emphasis of researching Web 2.0 in teaching and learning is provided by Greenhow, Robelia and Hughes (2009) who declare that a stronger research focus on students' everyday use and learning with Web 2.0 technologies in and outside of classrooms is needed. Against this backdrop, the present study sought to bridge this apparent literature gap by investigating how Web 2.0 technologies are being adopted and integrated in teaching and learning by students and lecturers in the Faculty of ISC at MZUNI.

1.2.1. Web 2.0 technologies

Until a decade ago, the "first-generation Web" now commonly described as Web 1.0 (Cormode & 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 & 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 (2005) thereby transforming the predominantly 'read-only' or Web 1.0 into a 'read-and-write'. Unlike the 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 in fact 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 & Gasser, 2008: 1) and "second wave of the World Wide Web" (Azab, Abdelsalam & Gamal, 2013) Examples of some popular and widely used Web 2.0 technologies include Blogs, Micro-blogs, Wikis, Real Simple Syndication (RSS) Feeds, YouTube, Flicker, Facebook, Twitter, Skype. Podcasts, Google Apps and WhatsApp (Armstrong & Franklin, 2008; Al-Qirim, 2010; Harinarayana & Raju, 2010:74; Luo, 2010:38; Makori, 2011:35; Hough & Neuland, 2012).

Since their emergence a decade ago, Web 2.0 technologies have been overwhelmingly adopted by various fields such as Engineering, Mining, Military, Marine, Media and Telecommunications, Music and Education. The higher education has not been spared from the Web 2.0 lure.

1.2.1.1. Web 2.0 and higher education

For many years, the Internet has remained one of the key resources where students and lecturers have tapped the necessary educational content. More recently, a new wave of Internet technologies called Web 2.0 technologies have emerged and are widely perceived as having potential to enhance further learning and sharing of information among learners and teachers (Hartshorne & Ajjan, 2009). The emergence of Web 2.0 technologies coupled with their subsequent adoption by universities has indisputably brought about appealing and efficient ways

of carrying out teaching and learning activities. A trio of researchers (Sarrafzadeh, Hazeri & 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. Web 2.0 technologies are also said to allow students' interaction with their classmates, lecturers and even experts from outside their educational institution. The use of Web 2.0 technologies is even more 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). The availability of various Web 2.0 technologies implies that lecturers and students have a wide choice of technologies that they can use with little or no cost and more significantly, with little or no training. Al-Qirim (2010) also observes that devices, such as iPads, tablets and smart phones, which support Web 2.0 applications are increasingly becoming affordable and more prevalent amongst students and lecturers.

1.2.2. Status of ICTs in Malawi

In Malawi, communication networks and ICT infrastructure are currently thriving and this development has increased accessibility to Internet facilities by many Malawians. Through the Malawi Communications Regulatory Authority (MACRA) in partnership with the International Telecommunication Union (ITU), the government has developed a number of strategies to promote public access to ICTs in Malawi. Chisa (2006:25) reports that the Malawi government through the Malawi Telecommunications Limited (MTL) has invested about US$50 million in a Fibre Optic Cable Network Project that makes the country enjoy a bandwidth of 10 megabytes per second. Connecting all parts of Malawi, the fibre builds the networks that form the country's national fibre-optic backbone providing voice, data, fax and radio communication systems. Mobile service providers have also helped to propel the permeation of ICT facilities. The growth of mobile technology, coupled with the on-going liberalisation of Malawi's telecom market is spurring proliferation of ICTs services especially the Internet across the country. Chaputula and Boadi (2010) report that the emergence of mobile phones services has enabled many Malawians who own Internet enabled phones to access the Internet anytime. Most mobile service providers offer their customers with smart phones and affordable data bundle prices.

Mtingwi and Van Belle (2012:60) report that organisations in Malawi are spending additional resources on the development and utilisation of ICT so that they are efficient, effective, and competitive in their functionalities to meet the constantly changing technological trends. There is effective and efficient public service delivery and interaction between the public service and citizens of Malawi through the implementation of e-government. The government provides early warnings to mitigate risks and impact of disasters and facilitates relief management using social media tools such as Twitter, Facebook and Blogs. Mobile phones, Twitter and Facebook are being used to alert the police about the crimes and robberies thereby helping mitigate crimes and enhance public security in the country.

1.3. Higher education in Malawi, Mzuzu University and the Faculty of ISC

According to UNESCO Education for All Global Monitoring Report (2003:5), the "vision of education emphasises a holistic and an interdisciplinary approach to developing knowledge and skills needed for a sustainable future as well as changes in values, behaviour and lifestyles". In response to this vision, the Malawi Government has so far established four universities which include the University of Malawi, Malawi University of Science and Technology (MUST), Lilongwe University of Science and Technology (LUANA) and Mzuzu University. The government has accredited five privately owned universities which include; Livingstonia University, Catholic University, Seventh Day Adventist University, Share World University and Exploit University.

Mzuzu University is situated in Mzuzu City some 350 kilometres north of the Capital Lilongwe. It was established in 1997 as a second national public university in Malawi with the mission to provide high quality education, training, research and complementary services to meet the technological, social and economic needs of individuals and communities in Malawi (Mzuzu University, 2013:2). As of 2014, MZUNI had a total population of 3,200 registered students across its five faculties which include Education, Information Science and Communications, Environmental Health, Environmental Sciences and Hospitality Management and Tourism (Mzuzu University, 2013).

Established in 2004, the Faculty of ISC is tasked to address the acute shortage of personnel in the information sector and to meet the information and technological needs of Malawi and beyond. It

has two departments which include LIS and Information and Communication Technology (ICT) which offer degree programmes in LIS and ICT respectively.

1.4. Problem statement

The researcher, who is a Staff Associate in the Faculty of ISC, observed that all lecturers in this faculty are provided with computers which are connected to the Internet. The Faculty has two fully-fledged computer laboratories, one with 30 computers and the other with 60 computers where a population of about 247 students access the Internet for free. Similarly, the main university library has a computer laboratory where students access the Internet at a much-subsidised fee while lecturers access absolutely for free. Chaputula and Boadi (2010: 144) report that Mzuzu University has received computer hardware and Internet facilities from the Rockefeller Foundation, Japanese Government, American Embassy and Malawi Government. Regardless of these ICT initiatives at MZUNI, there seems to be no literature to date to determine the extent to which Web 2.0 technologies have been adopted by students and lecturers in teaching and learning at this university. As stated in section 1.2, the only known studies to have been conducted in Malawi in relation to the use of ICT in teaching and learning are by Kadzera (2006) and Nyirongo (2009) who focused on the use of instructional technologies by lecturers. Although the Kadzera's and Nyirongo's studies are useful in demystifying the use of ICT in teaching in Malawian universities and colleges, they did not cover the aspect of Web 2.0. The present study bridged this literature gap by investigating how Web 2.0 technologies are being adopted and integrated in teaching and learning by students and lecturers in the Faculty of ISC at MZUNI.

1.5. Aim of the study

The overall aim of the study was to investigate the adoption and use of Web 2.0 technologies in learning and teaching by students and lecturers in the Faculty of ISC at MZUNI in Malawi.

1.6. Research questions

Following the indicators that MZUNI has invested in computer and Internet technologies as discussed above, the question that the study sought to answer is how are Web 2.0 technologies

being utilised in teaching and learning by students and lecturers in the Faculty of ISC? The study addressed the following four specific questions:

- What is the current awareness of and familiarity with Web 2.0 technologies amongst students and lecturers in the Faculty of ISC?
- For what purpose do students and 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 integrating Web 2.0 technologies in teaching and learning?
- What are the factors that influence students and lecturers in the Faculty of ISC to adopt Web 2.0 technologies?

1.7. Theoretical framework

From the background reading and the literature review (see Chapter Two), the researcher noted that the literature is replete with technological innovation theories and some of them include Diffusion of Innovations (Rogers, 2003), Analytical Model for Identification and Awareness of Reflexive Processes (Rosenberg, 1990; Jenkins, 2004) and the Decomposed Theory of Planned Behaviour (Taylor and Todd, 1995). However, in view of the technological innovation theories mentioned, the Decomposed Theory of Planned Behaviour appears to be the most widely accepted model by researchers in understanding reasons for rejection and acceptance of Web 2.0 in teaching and learning.

1.7.1. Decomposed Theory of Planned Behaviour

Taylor and Todd (1995) laid a very good foundation for understanding and studying rejection and acceptance of technological innovations through their Decomposed Theory of Planned Behaviour (DTPB). Through a series of studies, Hartshorne and Ajjan (2009); 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 teaching and learning in institutions of higher learning. 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. Figure 1 depicts the model.
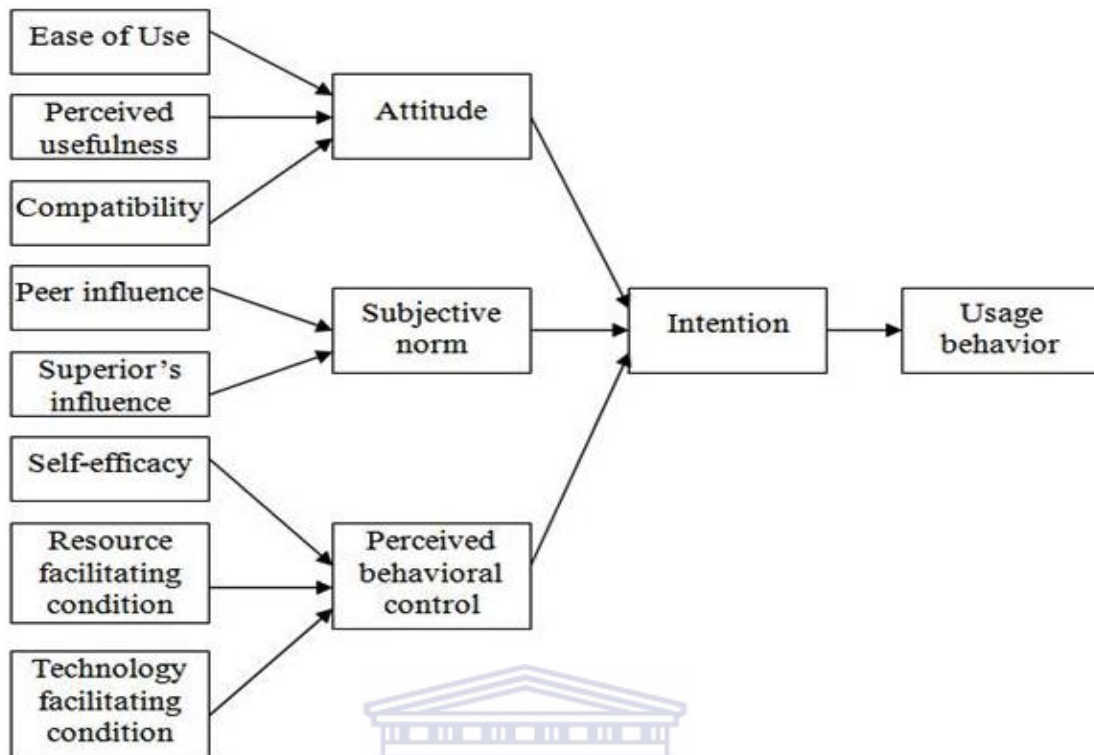
Figure 1. The Decomposed Theory of Planned Behaviour (Taylor & Todd, 1995:163)

1.7.1.1. Attitude

If individuals have positive feelings towards a particular technology, they are likely to accept it and if they have negative feelings towards the innovation, they are unlikely to adopt it (Taylor and Todd, 1995:155). Three factors in relation to attitude include perceived usefulness, ease of use and compatibility.

1.7.1.1.1. Perceived usefulness

Perceived usefulness is defined as the degree to which an individual believes that a technology can improve his/her job performance (Davis, 1989:320). In this case, lecturers and students are likely to accept Web 2.0 technologies if they have a feeling that these technologies can add value to their teaching and learning activities.

1.7.1.1.2. Ease of use

Ease of use represents the degree to which an innovation is easy to understand and operate (Rogers, 2003:70) or the degree to which a particular technology is free of effort (Davis,

1989:320). The implication is therefore that if lecturers and students perceive the Web 2.0 applications as user friendly, they are likely to accept and use them in their teaching and learning activities.

1.7.1.1.3. Compatibility

Compatibility is defined as the degree to which a technology fits with the potential existing values and experiences (Rogers, 2003:72) implying that lecturers and students will accept and use these technologies if they marry well with their already learning and teaching practices.

1.7.1.2. Subjective norms

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 and learning. In this case, students can be influenced to use these Web 2.0 technologies by fellow students or by their lecturers.

1.7.1.3. Perceived behaviour control

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). In this case, students and lecturers are likely to use Web 2.0 technologies if they are comfortable using them. Greater self-efficacy to use technological applications is likely to lead to higher levels of behavioural intentions and actual usage (Taylor & Todd, 1995:156). Secondly, students and 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).

1.8. Significance of the study

The anticipation of the researcher was that the results of the study would benefit a wide range of stakeholders, particularly the following:

- Policy makers, e.g. the Management of Mzuzu University, the Malawi Ministry of Education Science and Technology, educational planners and donor agencies in Malawi. The study provided these groups with a framework on which Web 2.0 technologies could be best incorporated in higher education particularly, in teaching and learning;

- Researchers with interest in teaching and learning using Web-based technologies. The resultant papers published in peer reviewed journals could add a valuable body of knowledge on Web 2.0 and higher education which could be used together with other research information to generate relevant policies that guide further research and practice in this area; and

- Teachers interested in teaching Web technologies. The study researched some of the most recently emerged Web 2.0 technologies which could be easier to understand if teachers make use of the articles from the thesis as teaching and learning materials.

1.9. Scope and delimitation of the study

The study targeted a specific number of Web 2.0 technologies as can be seen in the Web-based questionnaire which is publicly accessible at http://goo.gl/8lat1I (students) and http://goo.gl/nqOBPA (lecturers). Alternatively, refer to Appendices A and B for students' and lecturers' questionnaire respectively. These technologies were selected because they dominate the literature (Ajjan & Hartshorne, 2008; Conole & Alevizou, 2010; Mugwanya, Marsden & Boateng, 2011; Campion & Nailda, 2012; Hough & Neuland, 2012) about Web 2.0 in teaching and learning. All the research participants came from the Faculty of ISC leaving out the other four faculties at Mzuzu University.

1.10. Ethical considerations

1.10. 1. Informed consent and confidentiality of research participants

As required by the ethical guidelines of the Senate Research Committee of the University of the Western Cape (UWC), informed consent was sought in writing from participants before they started answering the questionnaire. Since the questionnaire was Web-based, the introductory part of the questionnaire was to seek an informed consent from respondents. See appendices A and B for students' and lectures' questionnaire respectively. Alternatively, visit

http://goo.gl/8lat1I (students) and http://goo.gl/nqOBPA (lecturers) to view the questionnaire online. Respondents were not asked to indicate their names. For lecturers who willingly indicated their email addresses so that follow-up interviews could be conducted with them, were assured that their names and email addresses would not be made public.

De Vos *et al.,* (2005:289) emphasise the need for researchers to be sensitive enough when conducting interviews with participants by ensuring that they do not ask questions which are very personal. In this study, the researcher conducted interviews with lecturers who by virtue of being researchers themselves were somehow conversant with their rights and were able to decide whether or not they wished to participate in the study. Since Davies (2006) says whilst the researched may agree to participate generally, they should nevertheless also feel free and be free to exercise their powers of veto during the research process. The researcher granted participants full rights to withdraw from the interview at any stage of the research process if they wished to do so without giving reasons.

Cater (2014) says if the researcher intends to record an interview, it is necessary to seek the interviewee's consent before the commencement of the interview. In light of this, the researcher informed the participants well in advance that the interview could be recorded and emphasised that they always had the right to turn off the video conferencing and continue audio only and or to stop the interview at any time. Thus, participating in the study was entirely voluntary.

1.10. 2. Approval of the study

Permission was sought in writing from the management of MZUNI to solicit data for the study and the researcher was granted permission to conduct a study on teaching and learning in the Faculty of ISC. See Appendices J and K.

1.11. Chapter outline

Chapter One: The researcher introduced the whole project by discussing aspects such as the rationale, motivation, concepts about Web 2.0 and theoretical framework that guided the study. *Chapter Two:* The researcher reviewed studies, published scholarly articles and other relevant information materials in relation to Web 2.0 in teaching and learning in universities.

Chapter Three: The researcher outlined an account on the methods employed when tackling the research problem. Issues ranging from research design, target population, data collection procedures and research instruments were discussed.

Chapter Four*:* The researcher presented, summarised and analysed the data collected using a Web-based questionnaire.

Chapter Five: The researcher presented, summarised and analysed data collected through content analysis and follow-up interviews conducted with some lecturers.

Chapter Six*:* The researcher discussed the results which were realised in Chapters Four and Five about the use of Web 2.0 in teaching and learning at Mzuzu University's Faculty of Information Science and Communications.

Chapter Seven: The researcher provided conclusions based on some general reflections distilled from the diverse insights realised from Chapters Four, Five and Six. The chapter also provided necessary recommendations, limitations of the study and suggested areas for further research in this area of interest.
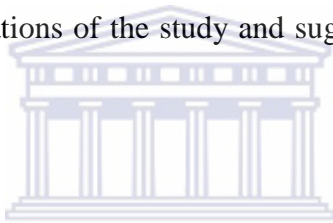
1.12. Conclusion

This chapter presented the introduction and background of this study on the use of Web 2.0 technologies by students and lecturers at Mzuzu University's Faculty of Information Science and Communications in Malawi. The chapter defined the research concepts, contextual setting, research problem and its research questions, significance of the study, scope and delimitations and it provided an outline of the thesis.

The next chapter (Chapter Two) will review literature in relation to Web 2.0 in teaching and learning.

CHAPTER TWO

LITERATURE REVIEW

2.1   Introduction

This chapter reviews literature on the subject Web 2.0 in teaching and learning in universities or higher education institutions. According to Kaniki (2006), a literature review is one of the important parts of academic research in that it serves to identify knowledge gaps and concretise the research problem, to identify a theoretical framework, to identify issues and variables related to the research problem, to identify conceptual and operational definitions as well as to identify methods suitable for the study. It is important to note that literature involves looking at what others have done in similar studies/research, although not necessarily in areas identical to one's own line of investigation (Leedy & Omrod, 2005:64). In other words, the logic behind the literature review is that individuals should build on what others have already done other than re-inventing the wheel.

In this chapter, the researcher begins by describing concepts of Web 2.0 followed by establishing the link between Web 2.0, learning and teaching. Finally, the researcher dwells on reviewing the literature in relation to teaching and learning using Web 2.0 technologies along the following lines:

- Awareness of and familiarity with Web 2.0 technologies;
- Purposes for Web 2.0 technologies in teaching and learning and Web 2.0 technologies used most;
- Benefits of Web 2.0 in teaching and learning; and
- Factors for use or non-use of Web 2.0.

2.2. Web 2.0 concept: antecedent and the present

As briefly highlighted in Chapter One, the term Web 2.0 was coined in 2005 by O'Reilly. The development of Web 2.0 was motivated by the limitations of the Web 1.0 to bring together Internet based business companies and consequently, O'Reilly (2005) says that some methods, concepts, and technologies which could help bring companies and Internet users together were brainstormed and compiled at a conference which centred on the potential future of the Web. It

can therefore be said that by sorting out the apparent limitations of Web 1.0 through the introduction of Web platforms that narrowed the gap in online interactions is what turned to be called Web 2.0. Since the first definition of Web 2.0 was coined by O'Reilly (2005), there have been various definitions in regards to Web 2.0. It is apparent from the literature that Web 2.0 is still being interpreted and understood differently with some scholars focusing on the aspect of technology while others focusing on the aspect of the user. For example, whereas Komiko (2007) understands Web 2.0 as an associated technology to include Blogs, social networking sites, shared bookmarks and image sites, and that it is intrinsically linked to the developing 'semantic Web', Abram (2007) sees Web 2.0 as the more human aspects of interactivity, conversations, interpersonal networking, personalisation, and individualism. However, despite researchers defining Web 2.0 in various ways according to the way they understand it, the most important factor is that all definitions revolve around the initial definition provided by O'Reilly (2005). Kwanya, Stilwell and Underwood (2012) caution that although the term Web 2.0 suggests a new version of the Web, it does not refer to an update of the Internet or the World Wide Web (WWW) technical standards, but to changes in the ways they are used.

2.2.1. Characteristics of Web 2.0

Habib (2006), Musser and O'Reilly (2007) are of the opinion that Web 2.0 technologies or platforms are characterised by some of the following core features:

- Web 2.0 allows users to customise the Web by adding, editing and altering content to the pages that they browse or visit. Such flexibilities of Web 2.0 are what qualifies it to be called a read/write Web, a characteristic that Web 1.0 or a read only Web lacks. Blogs, Twitter, Facebook and Wikis are some of the examples of read/write technologies which promote conversations amongst users instead of broadcasting as is the case with Web 1.0 which mimics broadcasting of a speech on television or radio;

- Web 2.0 provides platforms on which users can execute applications right from their Web browsers. For example, users can use applications such as Google Drive, Dropbox and MySpace to execute, manage and own their content or data;

- The Web 2.0 technologies have a "long tail" a phrase used to characterise users' freedom to publish and distribute content and other resources at a minimal cost on the Web. That is, Web 2.0 has eliminated barriers to storing space as people can now store their photos,

videos and data on Web- based applications for free or at a minimum cost. The characteristic extends to its ability to provide services to small or community groups with common interests – communities of practice;

- Web 2.0 technologies accord users an opportunity to add value to the content that they access and this leads to seamless exchange and building of a robust body of knowledge – a practice also called collective intelligence. In other words, knowledge is decentralised, accessible, and co-constructed by and among a broad base of users. Wikipedia provides an excellent example where many users access, share and contribute knowledge which in turn, attracts many new users;

- Web 2.0 does not require the users to have programing skills or specialist knowledge as they are simple to use and they provide user-friendly ways to loosely share and process datasets between partners; and

- Web 2.0 technologies continue to develop and they are not dependent on predetermined models. Web 2.0 structures and behaviours are flexible and they emerge overtime. Since they are flexible and adaptive, Web 2.0 technologies allow the formulation of solutions that respond to the real and current world issues and needs. Proponents of Web 2.0 have a belief that real success of technologies comes from cooperation and not control.

To simplify the understanding of Web 2.0, O'Reilly (2005) proposed a meme map (see Figure 2) which attempts quite successfully to graphically illustrate the concept of Web 2.0 and many of the impacts and opportunities connected to its concept. The centred orange rectangle represents the fundamental principles of Web 2.0 such as Web 2.0 as a platform, read/write Web and as collective intelligence. The green oval shapes on top represent the tools of Web 2.0 and the brown oval shapes from the middle down represent the characteristics and the use of Web 2.0.

Web 2.0 Meme Map

Flickr, del.icio.us: Tagging, not taxonomy

PageRank, eBay reputation, Amazon reviews: user as contributor

Blogs: Participation, Not publishing

BitTorrent: Radical Decentralization

Gmail, Google Maps and AJAX: Rich User Experiences

Google AdSense: customer self-service enabling the long tail

Wikipedia: Radical Trust

Strategic Positioning:
• The Web as Platform

User Positioning:
• You control your own data

Core Competencies:
• Services, not packaged software
• Architecture of Participation
• Cost-effective scalability
• Remixable data source and data transformations
• Software above the level of a single device
• Harnessing collective intelligence

"An attitude, not a technology"

The Long Tail

Data as the "Intel Inside"

The perpetual beta

Software that gets better the more people use it

Play

Trust your users

Small Pieces Loosely Joined (web as components)

Rich User Experience

Granular Addressability of content

Hackability

The Right to Remix: "Some rights reserved"

Emergent: User behavior not predetermined

Figure 2. The Web 2.0 meme map (O'Reilly, 2005)

2.3. Teaching, learning and Web 2.0: some perspectives and establishing the link

Teaching is defined by Chalmers and Fuller (2012:9) as the principle or intention of transmitting knowledge, skill and procedures from the teacher to the students. Based on this definition of teaching, it follows that learning is the process whereby leaners acquire knowledge, skills, procedures and experiences from teachers. Since time immemorial, researchers, education experts and other stakeholders have endeavoured in developing new techniques and best practices for the art of teaching and learning. An analysis of the socio-cultural theories developed by renowned educational researchers and psychologists such as Vygotsky (1980) and Barron (2006) can reveal that teaching and learning are underpinned by a recent innovation: Web 2.0. By examining how human social environments influence the learning process, Vygotsky (1980) concluded that human beings learn best if there are some sorts of interaction through

collaborative learning and group work so that "Students work together on a task". In one statement both, Vygotsky (1980) and Barron (2006) advocate for instructional strategies that promote the distribution of expert knowledge where students collaboratively work together to conduct research, share their results, and perform or produce a final project. That is to say the establishment of learning environments which are participatory, engaging and interactive is fundamental to achieving lifelong learning.

The so-called Web 2.0 proponents such as Farkas (2012:85) observe that there are strong links between Web 2.0 and socio-cultural theories of learning (Vygotsky, 1980; Barron, 2006) which see lifelong learning best achieved when there is a great interaction between instructors, learners and relevant learning resources during the teaching and learning process. Web 2.0 technologies such as Wikis, Twitter, Facebook and Blogs are some of the Web 2.0 technologies that are said to facilitate interactive, participatory and collaborative learning amongst students. Knowledge and skills are therefore shared amongst students who work collaboratively by forming 'learning communities' or communities of practice using Facebook, Twitter and Wikis.

2.4. Web 2.0 in teaching and learning

This section seeks to identify connections, contradictions and gaps in the literature in relation to the use of Web 2.0 in teaching and learning in higher education. To achieve this, the researcher reviewed literature from Europe (United Kingdom (UK), United States of America (USA), Spain, Sweden and Greece, Australia, South America (Brazil), Middle East (Iran), Indian Sub-continent (India), Asia (China) and Africa (Egypt, South Africa, Zimbabwe, Tanzania and Malawi). The review is conducted according to the four themes which include awareness of and familiarity with Web 2.0, purposes for 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.

2.4.1. Awareness of and familiarity with Web 2.0 technologies

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 Web 2.0 technologies and some researchers such as Linh (2008) emphasise the need for researchers interested in the use of technologies to pay attention to issues of awareness and familiarity.

In one study, Sandars and Shorter (2007) investigated the familiarity and use of Web 2.0 technologies amongst medical undergraduate students in the UK. The study revealed that although the overall adoption of Web 2.0 was high, the application of some technologies such as Podcasts is still marginal and there is a need to research more on some basic concepts such as awareness and familiarity for it to hold its ground. In this context, awareness means the students' and lecturers' knowledge about the existence of Web 2.0 technologies whereas familiarity refers to the skills and abilities for operating or using the Web 2.0 technologies. In this regard, 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 by distributing a close-ended structured questionnaire. 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 for learning and teaching. For instance, RSS Feeds, Blogs, and social bookmarking which are reported by other researchers (Ajjan & 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 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. Using the Diffusion of Innovations Theory (Rogers, 2003), 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 students 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 students and lecturers to Web 2.0 technologies is an important aspect for the successful adoption of these technologies in teaching and learning. Some students in South Africa have misconceptions about these technologies as well due to lack of knowledge, familiarity and awareness. Mugwanya, Marsden and Boateng (2011:278) report that "In fact, some students viewed them [Podcasts] as extra lessons which they did not need".

Provision of awareness programmes about Web 2.0 technologies amongst students and lecturers is reported to be bearing fruits in some universities. Azab, Abdelsalam and Gamal (2013) investigated the use of Web 2.0 among academic staff and students in Egyptian public universities. The results which were reached through distributing a questionnaire to academic staff show that the use of Web 2.0 technologies such as Blogs, Wikis and social networks among academic staff (mainly used for research activities and sharing academic content) is overwhelming, attributing the success story to frequent awareness and training programmes offered by the university. These researchers report further that the lecturers are of the view that such awareness programmes should be conducted regularly. This is essential especially taking into account that some researchers (Franklin & Harmelen, 2007; Tyagi, 2012) independently observe that the sheer number of Web 2.0 technologies which have overlapping functionalities means that it can be difficult for students and lecturers choosing which ones to use.

Although most of the studies or scholarly articles reviewed in this section suggest that awareness and familiarity have an impact on the keenness of academic staff and students to use Web 2.0 in teaching and learning, they are not very clear about who should be responsible for providing such awareness programmes. It is significant that the present study should, among others issues, investigate how best these skills and abilities can be imparted to students and lecturers.

2.4.2. Web 2.0 technologies in teaching and learning: purposes and most popular choices

The literature suggests that whereas most studies have simultaneously addressed the issues of purposes of Web 2.0 in teaching and learning and the types of Web 2.0 technologies mostly used, others have concentred more on one of the two aspects. Thus, the first part of this section reviews the literature about the purposes of Web 2.0 in teaching and learning whereas the second part, reviews literature about some common Web 2.0 technologies used in teaching and learning.

2.4.2.1. Purposes for Web 2.0 technologies in teaching and learning

Web 2.0 is used for various purposes and it brings about several benefits in teaching and learning (Al-Qirim, 2010). The literature indicates that the use is dependent on particular groups of users who include lecturers, undergraduates and postgraduates (researchers).

In Egypt, Azab, Abdelsalam and Gamal (2013) investigated the use of Web 2.0 by academic staff in public universities (see section 2.4.1) 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) (see section 2.4.1) 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. Web 2.0 technologies are also extensively used for communication amongst students and lecturers in the USA. Using a survey-based methodology, Li and Pitts (2009) investigated the use of virtual office hours as a medium for traditional and non-traditional undergraduate students to communicate with their professors using Web 2.0 technologies at a public USA University in the southeast. Based on the findings, the researchers emphasise that "one key area where Web 2.0 technologies especially Facebook and Instant Messaging have a significant impact is in their ability to transform the way in which professors and students are able to communicate and interact with one another".

A large body of research shows that students can use Web 2.0 technologies to publish their own writings, to discuss group assignments and to conduct peer reviews for each other's work. A case study research was conducted at a Swedish University by Augustsson (2010) to investigate

collaborative activities which were implemented using Web 2.0 technologies by undergraduate psychology students. The researcher tested the results against the Analytical Model for Identification and Awareness of Reflexive Processes (Rosenberg, 1990; Jenkins, 2004) and the findings show that Web 2.0 technologies are used to support students' reflections concerning their own and others' thoughts and emotions, to support individual students and integrate them into a work group and finally, Web 2.0 develops students' identification and awareness in relation to self and to others. However, the weakness of this study is that it does not explicitly mention the Web 2.0 technologies that are used to accomplish these academic activities.

Some researchers have embarked on examining the practical use of some Web 2.0 technologies in a classroom environment by focusing on a single Web 2.0 technology. After subjecting university students studying English as a foreign language to the use of Blogs at a Brazilian university for a semester, Soares (2008) decided to investigate students' perception about Blogs as learning tools. The study used an online survey which was answered by 16 students and the results show that students used Blogs to communicate with other students and to improve their writing skills in the English language by accessing tutorials in the form of Podcasts and videos shared on their Blogs and YouTube. The findings corroborate those of Churchill (2009) who experimented with the use of Wikis, Blogs, social networking and social bookmarking as teaching and learning tools at the University of Hong Kong in the People's Republic of China. The researcher collected the data through observation, analysis of Blog activities (content analysis), interviews and using a questionnaire. The study demonstrated that Web 2.0 technologies are used by students to read Blogs of others, receive comments, preview tasks of others and read feedback received from lecturers. RSS Feeds are particularly used by students to subscribe to information and access the latest posts from students and lecturers' Blogs, Wikis and Websites. Along the same lines, Luo (2010) argues that Web 2.0 technologies can be used to develop research projects and provide a reflection from the prescribed readings and that the academic staff can use Blogs, Wikis, Facebook, Twitter, Delicious and Podcasts to publish course resources for distance education students, facilitate group authoring of a document, facilitate course evaluation and allow students to collaboratively write reviews of courses they have taken.

From the studies reviewed in this section plus other studies conducted in Cyprus (Eyyama, Menevis & Dogruer, 2011), the Caribbean (Gaffar, Singh & Thomas, 2011), USA (DeSchryver *et al.,* 2009; Greenhow, Robelia & Hughes, 2009), UK (Luckin *et al.,* 2009) and Zimbabwe (Zanamwe, Rupere & Kufandirimbwa, 2013), a summary of five main purposes of Web 2.0 technologies can be emphasised as follows:

- To communicate classroom and research activities: primarily, communication could be amongst lecturers themselves, lecturers with students or students with other students (Eyyama, Menevis & 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 communicate with friends: Facebook, Twitter, WhatsApp and Viber are some of the most popular applications used for this purpose. Gaffar, Singh and Thomas (2011:139) claim that students at a Caribbean University access their Facebook and Twitter accounts at least twice per day in order to communicate with fellow students, relatives and friends;

- 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 & Hughes, 2009);

- Used as platforms for reflection on what students have learnt in the preceding week. This researcher is a beneficiary of this use of Web 2.0 technologies at his current university in South Africa where Blogs, Wikis and Twitter are used extensively as tools to communicate with lecturers and fellow postgraduate students about what one has learnt in the previous week; and

- To make professional contacts: for example, Zanamwe, Rupere and Kufandirimbwa (2013:9) 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. Greenhow, Robelia and Hughes (2009) also note that Web 2.0 allows students and lecturers

to develop their networks and increase the number and range of people to consult for feedback or support.

2.4.2.2. Web 2.0 technologies used in teaching and learning

The studies reviewed in section 2.4.2.1 have so far revealed that some of the Web 2.0 technologies that are used in teaching and learning include Facebook, Twitter, Wikis, Podcasts, Blogs, Bookmarks, RSS Feeds and YouTube. This section is dedicated to reviewing literature in relation to specific types of Web 2.0 technologies that are used in teaching and learning.

Kumar (2009) conducted a survey that assessed undergraduates' use and perceptions of the usefulness of Web 2.0 technologies in higher education in the USA. Data was gathered through conducting focus groups and results show that most students used Blogs and Wikis for online discussions, YouTube and Podcasts for classroom lectures and Google Documents for collaborative document sharing. The findings are not unique to the USA because similar technologies have been reported by Conole and Alevizou (2010) in their report commissioned by Higher Education Academy about the use of Web 2.0 technologies in higher education in the UK. The researchers reviewed reports, conference papers, journal articles and the higher education curricula about Web 2.0 in higher education in the UK. The researchers found that Twitter, Facebook, Blogs, Wikis, Flickr, YouTube, Podcasts and RSS Feeds are embedded in the curricula and were extensively used to carry out various academic activities similar to those identified in section 2.4.2.1.

Since the literature shows that a good number of mobile devices and smart phones have the capability to support most of the Web 2.0 applications, researchers such as Echeverría *et al*., (2011) claim that such devices are increasingly being used by students and lecturers for mobile instant messaging, mobile social networking (Facebook, Twitter and Viber) and Web based learning. To this end, Koch and Van Brakel (2012) surveyed third year Information Technology students' experiences of ubiquitous mobile device applications (WhatsApp, Mxit, Skype and Facebook) and mobile learner management systems (LMS) at a South African university of technology. The two researchers report that a good number of students gave WhatsApp a favourable rating because of its perceived ease of use as compared to LMS. One may not be amazed by such findings because, after all, WhatsApp is increasingly providing an instant and

cheap communication means connecting students who would otherwise be unable to do so due to their economic hardships. Similarly, Drumheller *et al.*, (2010:23) also claim that "social network sites such as Facebook, Twitter, MySpace and WhatsApp which are available on mobile devices, are what the millennial generation students (those born after 1982) use to instantly communicate, share photos and discuss ideas, hence their suitability in teaching and learning"

Although most social network technologies such as Twitter, YouTube and Facebook are extensively used by students and lecturers as revealed in the literature, Kumar (2009) cautions that the popularity of some Web 2.0 technologies amongst students and lecturers does not necessarily mean that they are being utilised for teaching and learning. Indeed, by systematically analysing the content of the Facebook pages of 909 undergraduate students at Coalsville University School of Social Sciences in the UK, Selwyn (2007) found that only four per cent of the Facebook wall postings over the five-month period of analysis were related to students' studies or academic aspects. Madge *et al.,* (2009) also claim that most students and lecturers in UK universities use Facebook for social reasons, not for formal learning purposes, although it is sometimes used informally for learning purposes. Similarly, using the Interaction Equation Model, Roblyer *et al.*, (2010) conducted an online survey on students and lecturers at a USA based university with the aim of comparing the use of Facebook between the two groups. The researchers found that 95% of students were actively using Facebook and 73% of lecturers had accounts with Facebook but both groups rarely used Facebook for coursework or academic activities.

2.4.3. Benefits of Web 2.0 in teaching and learning

Potential benefits of Web 2.0 in teaching and learning from academic staff's perceptions are highlighted in various studies and scholarly articles.

Using the Technological Innovation Theories as a foundation, Al-Qirim (2010) set out to develop a framework for governing Web 2.0 implementation in teaching and learning in the USA. 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 viz. reduction of costs and time, easier and faster access to information when it is needed, 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 the academics' perceptions of the potential benefits of Web 2.0 in their teaching contexts at a research-intensive university. By distributing a questionnaire and conducting follow-up interviews, 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 (for example Wikis and Blogs), improved students' participation in the learning process through group based projects (for example, Wikis), facilitated distribution of lecturer generated content and facilitated news provision to students through built in RSS Feed facilities in Blogs and Wikis. Correspondingly, Bawden (2008:23) reports that in London, lecturers have been successful in augmenting or replacing discussions on boards with Blogs and Wikis which are used to gather students' contributions rather than using attached files, and Podcast and vodcast recordings are used to record lectures as a complement to text files.

Studies conducted in Zimbabwe have also yielded similar results to those of Al-Qirim (2010) and Brown (2012). An analysis of a study on the benefits of Web 2.0 technologies in higher education in Zimbabwe from learners' perspectives by a trio of researchers, Zanamwe, Rupere and Kufandirimbwa (2013) reveals some benefits worth sharing. By distributing a questionnaire to undergraduate students at the University of Zimbabwe, the researchers found that Facebook, MySpace, LinkedIn and Twitter facilitate students' group work without necessarily meeting physically, improve learners' technology proficiency and help learners to communicate and connect with new friends.

But why do some researchers such as Schroeder and Greenbowe (2012) argue that library schools are required to champion the use of Web 2.0 in teaching and learning? A trio of Iranian researchers gives a hint to the preceding question. Findings by Sarrafzadeh, Hazeri and Alavi (2011) about a study on knowledge and use of Web 2.0 technologies by LIS academics in Iran show that apart from receiving a quick feedback from students and enhanced role of students as knowledge creators and not as just knowledge consumers, academic staff in LIS schools strongly believe that integrating Web 20 in teaching and learning helps prepare students for Library 2.0 thereby increasing employability of these students. Library 2.0, in this context, 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. This is

probably the reason some researchers have attempted to examine the extent to which library schools have addressed Web 2.0 technologies in the curriculum. Garoufallou and Charitopoulou (2012) who upon reviewing the LIS Web portals of four USA (Rutgers University, Kent State, Indiana University and University of Michigan), four UK (Liverpool John Moores University, University of Strathclyde, City University London and Manchester Metropolitan University and three Greek (Alexander Technological Educational Institution of Thessaloniki of Athens and Archives and Library Science at the Ionian University) LIS schools, found that there was very sparse evidence about the presence of Web 2.0 in the LIS modules. However, the researchers defend these schools by stating that the first look at departmental curricula does not warrant criticism of the departments as it is possible to teach or implement Web 2.0 applications without mentioning this information in short curricula descriptions presented in their Web portals.

A summary on the key benefits of Web 2.0 technologies in teaching and learning as uncovered from the literature is as follows:

- A noticeable increase in communication and collaboration amongst students both in class and online (Ajjan & Hartshorne, 2008:74; DeSchryver *et al.,* 2009; Goldfarb *et al.,* 2011; Minocha, 2009). 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 develop more independent learning skills and confidence, and become co-producers of class knowledge and content (Al-Qirim, 2010; Schroeder & Greenbowe, 2012);

- Web 2.0 enables students to seek help and support outside of normal class room hours from each other and from lecturers (Brown, 2012:51);

- Students can easily follow current events and integrate them into their discussions and assignments, and instantly engage online with people involved in the topic area (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; and

- Finally, Farkas (2012:85), and Franklin and Harmelen (2007) suggest 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.

2.4.3. 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 and students 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 by distributing a questionnaire and conducting follow-up interviews with professors. Results which were interpreted through the lens of the Decomposed Theory of Planned Behaviour reveal that lack of necessary skills scare the lecturers. So it is clear to see that lecturers perceive Web 2.0 applications as difficult to use hence, their unwillingness to incorporate them in their teaching and learning activities. On a positive note though, the same study reveals that some lecturers use Web 2.0 technologies because they feel 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.

Another study that was conducted using the Decomposed Theory of Planned Behaviour was by Gaffar, Singh and Thomas (2011) who investigated the limiting factors to achieving maximum benefits from Web 2.0 adoption in the teaching and learning process. By adopting a case study approach, the researchers distributed a questionnaire to students and sent a Web-based questionnaire to lecturers at the Caribbean University. The study shows that although all lecturers were influenced by 'perceived usefulness, ease of use and compatibility', students seemed not to be ready to use some technologies due to poor Internet connection, lack of ICT skills, inadequate computers, and unwillingness on the part of lectures to use these technologies as teaching aids.

In the USA, Ajjan and Hartshorne (2008) assessed the factors that motivated students and lecturers to use Web 2.0 technologies as supplements to teaching and learning. The researcher sent a questionnaire to students and lecturers and the results which were interpreted using the Decomposed Theory of Planned Behaviour show that lecturers and students found Web 2.0 technologies easier to use, useful to their work and fitted with their existing teaching practices and they consequently adopted them. On the other hand, unlike students, lecturers were not influenced to use the Web 2.0 technologies by their superiors, peers and students mainly because they independently prepared lectures/lessons.

In Tanzania, Lwoga (2012) analysed the challenges affecting the application of e-learning and Web 2.0 in public universities. By distributing a questionnaire and conducting interviews with ICT personnel as well as analysing ICT policy, strategic plans and university Websites, the researcher found that the adoption of Web 2.0 technologies is still in its infancy stages due to poor technological infrastructure, prohibitive cost of Internet technologies and unreliable electricity. It appears electricity and poor Internet infrastructure are common in most African countries including Malawi. Nyirongo (2009) who conducted a case study about the adoption of ICTs in teaching by lecturers at Mzuzu University also noted that electricity and poor Internet connectivity were the major hindrances that inhibited the integration of ICTs into academic activities. Similarly, Chaputula (2012:380) observes that persistent power outages are one of the factors that negatively affect access to ICTs by lecturers and students at Mzuzu University. The high cost of ICT infrastructure and low Internet bandwidth are further highlighted in other studies as limiting factors for the adoption of Web 2.0 by most African Universities. Correspondingly, a study of 54 tertiary institutions from 27 countries showed that the average African university bandwidth capacity for the uplink and downlink is 706 and 1254 Kbps respectively which is equivalent to a broadband residential connection available in Europe (Gakio, 2006). However, there seems to be some progress in regards to the permeation of Internet into the African region according to the most recent report by the International Telecommunication Union (2014) which indicates that "… the number of Internet users has grown steadily, from 6 per cent in 2008 to 16 per cent in 2013. Close to 7 per cent of households in Africa now have Internet access at home, compared to only 2 per cent in 2008".

2.5.   Conclusion

This chapter has presented a review of the literature about Web 2.0 technologies in teaching and learning by students and lecturers. The literature review made specific reference to some empirical studies about Web 2.0 in teaching and learning which were conducted in different parts of the world such as USA, UK, South Africa, Tanzania, Greece, Spain, Brazil, Iran, Egypt, Zimbabwe, Australia, India, Sweden, China, Cyprus and Malawi.

It was clear from the literature that the theoretical frameworks used by most researchers to understand the adoption of Web 2.0 in teaching and learning in higher education include Rogers (2003)'s Diffusion of Innovations Theory (Al-Qirim, 2010; Mugwanya, Marsden & Boateng, 2011), Jenkins (2004)'s and Rosenberg (1990)'s Analytical Model for Identification and Awareness of Reflexive Processes (Augustsson, 2010)) and Taylor and Todd (1995)'s Decomposed Theory of Planned Behaviour (Ajjan & Hartshorne, 2008; Gaffar, Singh & Thomas, 2011; Campion & Nailda, 2012). The most common theory is the Decomposed Theory of Planned Behaviour which has since been adopted by the researcher for the present study.

Apart from revealing that the common research approaches used to study the adoption of Web 2.0 in teaching and learning in higher education include case studies, surveys, longitudinal studies and document analysis, the literature also showed that most researchers (Churchill, 2009; Gaffar, Majhi & Maharana, 2011; Mugwanya, Marsden and Boateng, 2011; Singh and Thomas, 2011; Brown, 2012; Campion & Nailda, 2012; Lwoga, 2012; Azab, Abdelsalam & Gamal, 2013) adopted mixed research designs by collecting data through content analysis, questionnaires, interviews, observations and focus group.

The literature therefore successfully guided the researcher about the research methods adopted in his study. The next chapter (Chapter Three) will discuss how some of these research methods were applied in the present study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1.   Introduction

The preceding chapters laid down the background of the study and conceptualised and contextualised the research concepts. This chapter describes the research methods and techniques that were used in connection with the use of Web 2.0 technologies in learning and teaching at the Faculty of ISC at MZUNI in Malawi. Brewerton and Millward (2001) define a research methodology as a process by which research questions are realised into actions and measured to achieve the overall research aim and objectives. In particular, the chapter highlights the participants of the study, research designs and methods, how the mixed methods were implemented using data collection tools including questionnaires, content analysis and interviews. It also dwells on how the participants were identified and explains the procedures which were employed in presenting and analysing the data

The general aim of the study was focused on investigating how Web 2.0 technologies are being utilised by students and lecturers to accomplish their learning and teaching activities in the Faculty of ISC at MZUNI in Malawi. There are two major reasons that influenced the researcher to choose this Faculty. Firstly, the Faculty is an important training centre for ICTs in Malawi implying that its students and lecturers are already conversant with the technologies (Web 2.0) being studied. Secondly, the researcher is a member of staff in the Faculty and he thought it could be easier for him to be granted permission by the management of Mzuzu University to conduct the study at this place and to access the respondents or participants. The researcher came up with four research questions that guided the study in achieving its overall aim as follows:

- What is the current awareness of and familiarity with Web 2.0 technologies amongst students and lecturers in the Faculty of ISC?
- For what educational purpose do students and 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 integrating Web 2.0 technologies in teaching and learning?

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

3.2. Participants of the study

The participants for this study were students and lecturers in the Faculty ISC at MZUNI. Student participants were undergraduates doing their four-year programmes in ICT and LIS. These students join the university with very little or no ICT skills because most of the secondary schools in Malawi from which the university selects these students do not offer any ICT or related courses. The Faculty requires these students to register for two compulsory ICT courses (End-user Computing as well as Computer and Communication Technology) in first year with the aim of equipping them with the basic ICT skills and knowledge. In later years of their studies, students in both departments pursue other ICT related compulsory courses which include Databases Management Systems, Web Design, Instructional Media and Technology and Computer Networks. Apart from doing the courses mentioned, students in LIS concentrate on LIS courses whereas ICT students concentrate on studying many other ICT related courses until they graduate. Table 1 depicts a summary of students in the Faculty.

All lecturers in the Faculty possess basic ICT skills which enable them to 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. There are 19 lecturers in the Faculty of ISC of whom 10 (Nine males and one female) are from the LIS department whereas nine (Eight males and one female) are from the ICT department.

Table 1. Student population by department, level and gender

Department				
LIS			ICT	
Level	Males	Females	Males	Females
One	33	22	20	17
Two	28	15	16	5
Three	20	10	18	8
Four	20	5	10	7
Total	93	52	64	37
Grand Total	246			

In case study designs, researchers often use purposive samples (Oliver, 2006). According to Babbie (2004:94), purposive sampling involves the selection of the units to be observed on the basis of the researcher's own judgment about which ones will be the most useful or representative. In this type of sampling, the researchers use their discretion, knowledge or experience to select the sample they think matches the purpose of their study (Basit, 2010). In light of this, the researcher identified the participants based on three criteria: the researcher 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. In addition, the researcher wanted student participants who had completed at least two ICT compulsory courses. Based on his knowledge and experience as a Staff Associate in the Faculty, the researcher was of the view that all lecturers met the criteria and consequently, all 19 lecturers were included in the study. However, the researcher included only students in levels two, three and four leaving out students in level one who had recently joined the university. This means that the said participants had "particular features, capabilities and characteristics" (Saunders, Lewis & Thornhill, 2002:78) which enabled a detailed exploration and understanding of central themes and puzzles about the use of Web 2.0 technologies by students and lecturers in teaching and learning. Gikenye (2012:107) emphasises that a purposive sampling technique allows a researcher to obtain a sample that is manageable and cost effective to work with. Thus a total of 186 students who were in levels two, three and four were all included in the study.

3.3. Selection of research methods

Following a review of literature about the field of Web 2.0 in relation to teaching and learning in universities (see Chapter Two), the researcher noted the methodologies which had been used. The nature of this study prompted the researcher to adopt a mixed methods approach.

3.3.1. Research design and methods

In this section, the researcher discusses the research design and the methods (quantitative and qualitative) adopted in the study.

3.3.1.1. Research design

This study is based on a single case study of a faculty in a university. The value of the case study is to understand the impact and influence that the organisational and environmental context is having on and influencing social processes (Hartley, 2004:325) and in this case, the teaching and learning processes involving Web 2.0 technologies in the contextual setting of the Faculty of ISC at MZUNI. 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. In order to gather satisfactory and more reliable data, the researcher adopted both, quantitative and qualitative designs.

3.3.1.1.1. Quantitative and qualitative designs

Research designs in education and the social sciences are often divided into two main types: quantitative and qualitative designs (Muijs, 2010:1). Aliaga and Gunderson (2000:3) point out that quantitative design is defined as research which involves 'explaining phenomena by collecting numerical data that are analysed using mathematically based methods (in particular statistics)'. This is to say that this kind of research focuses on capturing frequencies and numbers. Creswell (2009) notes that data collected through quantitative methods provide information which can easily be analysed statistically to generalize respondents' explicit and implicit claims. This is the major advantage that this researcher benefited by adopting this design as data were easily presented and analysed (see Chapter Four) using the Statistical Package for the Social Sciences (SPSS) and Microsoft Excel.

Qualitative design is defined by Patton (1990:22) as

> *Detailed descriptions of situations, events, people, interactions, and observed behaviours, direct quotations from people about their experiences, attitudes, beliefs, and thoughts and excerpts or entire passages from documents, correspondence, records, and case histories.*

Some of the strengths of qualitative design, according to Matveev (2002) and Creswell (2009) are that it provides flexible ways in which to collect, analyse and interpret data; it provides a holistic view of the phenomena under investigation and finally, it enables the researcher to interact with the research participants in their own language and on their own terms. However, Creswell (2009) notes in this design that respondents can choose to tell certain stories and ignore others.

3.3.1.1.2. Mixed method designs

Since each of the research designs (quantitative and qualitative) have some strengths and weaknesses, combining the two designs seemed a practical option. After all, most studies (Azab, Abdelsalam & Gamal, 2013; Brown, 2012; Campion & Nailda, 2012; Churchill, 2009; Gaffar, Singh and Thomas, 2011; Majhi & Maharana, 2011, Mugwanya, Marsden and Boateng, 2011; Lwoga, 2012) which have been reviewed in Chapter Two adopted a similar approach and they successfully yielded reliable results. Teddlie and Tashakkori (2006:18) argue that in case study research designs, researchers need to collect data that provide both breadth and depth or both causality and meaning. Thus, to collect such useful and rich data for this purpose, the so-called mixed methods become a practical option. Muijs (2010:8) points out that in mixed-methods research, qualitative or quantitative components can predominate, or both can have equal status. In this study, quantitative and qualitative designs had equal status.

3.3.1.2. Data collection procedures and instruments

In order to collect both quantitative and qualitative data, the researcher collected the data as follows: First, the researcher sent a Web-based questionnaire consisting of both open-ended and closed-ended questions to students and lecturers. Second, the researcher analysed the curricula of the two departments looking for Web 2.0 elements. Finally, follow-up interviews were conducted with some lecturers.

3.3.1.2.1. Web – based questionnaire and its design

One of the tools used to collect data in this study was a Web-based questionnaire. A questionnaire is a form containing a set of questions to be completed by a research participant (Connaway & Powell, 2004:146). A Web-based questionnaire is a type of a questionnaire which

is deployed online and requires the participants answer the questions by means of inputting their answers while connected to the Internet. Archer (2014) and Sincero (2014) have identified some advantages associated with the use of a Web-based questionnaire. Primarily, it makes it easier for a researcher to collect data from participants who might be geographically isolated. This is made possible because, according to Sincero (2014), the Internet is a vast virtual world that connects people from around the globe. By using a Web-based questionnaire, the costs incurred in the administration of the questionnaire are reduced (Archer, 2014). This researcher avoided costs such as buying paper and printing of the questionnaire as could have been the case with a paper based questionnaire. A Web-based questionnaire allows for automation in data input and handling. This is one of the most outstanding capabilities of a Web-based questionnaire, according to Archer (2014). Here, when respondents input their answers, the responses were automatically documented and stored in a survey database thereby providing hassle-free handling of data and any possibility of data errors. In this study, after the respondents had filled the questionnaire, data were imported from the online dataset to SPSS for analysis.

However, Web-based questionnaires have some drawbacks. Archer (2014) warns that the absence of an interviewer means that the researcher is deprived of an opportunity to probe more information from participants. To deal with this problem, the researcher conducted follow-up interviews with seven lecturers who responded to the questionnaire. Sincero (2014) argues further that this method of collecting data is only appropriate for surveys that require participants who have access to the Internet. Both students and lecturers who participated in this study had access to reliable Internet which was accessible free of charge within the MZUNI campus (see section 6.2.4. of Chapter Six).

The questionnaire was developed using Google Forms (http://www.google.com/drive/apps.html) and was distributed to all students and lecturers through emails, Facebook and Twitter. The students' questionnaire consisted of 12 closed-ended questions whereas the lecturers' questionnaire comprised 14 questions with a mixture of closed-ended and open-ended questions. The lecturers' questionnaire had five sections whereas the students' questionnaire had four sections. See Appendices A and B for students' and lecturers' questionnaire respectively. The questionnaire is also publicly available online at http://goo.gl/8lat1I (students) and http://goo.gl/nqOBPA (lecturers). All questionnaire questions were formulated in such a way that

the data collected could be interpreted using the Decomposed Theory of Planned Behaviour model designed by Taylor and Todd (1995) which underpinned the study.

Section A (questions 1-4 for lecturers and 1-3 for students): Questions in this section gathered data on participants' personal information such as gender, designation (lecturers), qualifications (lecturers) department and level of study (students).

Section B (questions 5-8 for lecturers and 4-7 for students): This section gathered data on the level of awareness of and familiarity with Web 2.0 technologies amongst lectures and students by focusing on knowledge about and proficiency in the use of Web 2.0 technologies, technological devices used to connect to Web 2.0 technologies and places where to access these Web 2.0 technologies.

Section C (questions 9-11 for lecturers and questions 8-10 for students): This section attempted to find out from lecturers and students the main purpose for which they used Web 2.0 technologies. Particular issues covered include the general and specific educational activities and common Web 2.0 technologies used for academic activities.

Section D: (questions 12-16): The section was exclusive to lecturers and it attempted to find out from lecturers' perceptions on the benefits of Web 2.0 technologies in teaching and learning in general and when applied to a classroom environment.

Section E for lecturers and Section D for students (questions 17-19 for lecturers and questions 11-12 for students): These sections aimed at finding out from lecturers and students the factors that influence them to use or not to use Web 2.0 technologies in their teaching (for lecturers) and learning (students) activities.

3.3.1.2.2. 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 & Omrod, 2005:142; Neuman, 2006:322). Connaway and Powell (2004:220) observe that "content analysis is applied in qualitative, quantitative, and mixed-methods studies". The body of knowledge being analysed contains text data that might be in verbal, print or electronic form and can be contained in articles, books, manuals, memos, leaflets, pamphlets (Kondracki, Wellman & Amundson, 2002), websites and cultural artefacts (Krippendorff, 2013).

As a general rule, content analysis is quite systematic, and measures are taken to make the process as objective as possible. Leedy and Omrod (2005:142) identify three steps in content analysis as follows:

a) The researcher identifies the specific body of material to be studied. If this body is relatively small, it is studied in its entirety. If it is quite large, a sample is selected. In this study, the researcher analysed the curricula of the two departments in the Faculty to check Web 2.0 elements. All 43 and 44 courses offered in the LIS and ICT departments respectively were analysed. Documents such as course outlines, lists of references and assignments for each of the courses were analysed to help the researcher obtain a detailed understanding about the use of Web 2.0 technologies in the Faculty. Since the documents mentioned are in most cases not lengthy, a decision was taken to study them in their entirety implying that no sampling was done.

b) The researcher defines the qualities or characteristics to be examined in precise and concrete terms. To achieve the desired results of this process, a content analysis schedule was developed to capture data appearing in the course outlines, exercises and lists of references. As can be seen in Appendix D, the content analysis schedule thus consisted of the following:

- Name of department;
- Name of the course/module title;
- Semester/level the course is offered;
- Duration of the course/module; and
- Web 2.0 contents in the module.

c) If the material to be analysed involves complex or lengthy items, the researcher breaks down each item into small manageable segments that are analysed separately. This process was not applicable in this study.

3.3.1.2.3. Follow-up interviews

Interviews are extensively used by researchers in the social sciences discipline as a tool for collecting detailed information concerning a topic or subject (Wilkinson & Birmingham, 2003). One major advantage of interviews is that they enable the researcher to interact directly with participants thereby providing new insights about the issue being researched (Russ-Eft &

Preskill, 2001) and unexpected variables may emerge (Muijs, 2010:8). However, other researchers such as Wilkinson and Birmingham (2003) argue that interviewing takes a lot of time and it is therefore not appropriated for gathering data from large populations. To deal with this problem, the researcher conducted interviews with seven lecturers which was a manageable number. Since interviews help researchers to obtain in-depth information from participants about their feelings and knowledge concerning the issue being explored (Yates, 2004), they were best suited for this case study. Using an interview protocol (see Appendix C), the researcher asked lecturers various questions with the aim to gain a comprehensive understanding about the data collected through the questionnaire instrument and through analysing the curricula. This enabled the researcher to obtain additional in-depth data that helped shed more light on the use of Web 2.0 technologies. Tellis (1997) warns researchers not to rely on a single informant, but rather seek the same data from varied sources to substantiate it. In this study, four LIS and three ICT lecturers were interviewed to ensure that multiple views regarding the use of Web 2.0 in teaching and learning in the Faculty were obtained.

Interviews were conducted via Skype because the researcher was based in Cape Town while the participants were in Malawi. As stated in the previous sections (see section 1.8.1 of Chapter One), lecturers who were willing to be interviewed indicated their email addresses while filling the Web-based questionnaire. The researcher contacted the interviewees, obtained their Skype ID and arranged a mutual date and time to call. During the interview process, the researcher guided the interviewee to discussion of influences, e.g. "You indicated [in the questionnaire] that you can teach without Web 2.0 technologies. Could you say more about that?" The researcher used the Parrot Voice Recorder, an application found on BlackBerry 10 to record the interviews.

Thus, it is clear that the study was conducted in three phases. In phase one, a questionnaire was sent to students and lecturers. Phase two involved analysing the curricula. Phase three involved conducting follow-up interviews with seven lecturers to seek clarification on some concepts and or elaboration on themes identified in phases one and two. Data from all three data sources were triangulated in order to obtain a holistic picture about the adoption and use of Web 2.0 in teaching and learning by students and lecturers in the Faculty of ISC.

3.3.1.3. Pretesting of research instruments

A pre-test gives the researcher an opportunity to identify questionnaire and interview guide items that tend to be misunderstood by the participants and which may result in unintended information (Connaway & Powell, 2004:161). To ascertain the logicality and clarity of the interview protocol and the questionnaire, the researcher conducted a pilot study with three lecturers and ten students in the Department of Library and Information Science at the University of the Western Cape in South Africa. Necessary corrections were made based on the feedback.

3.3.1.4. Data Analysis

Data from the field were organised in order to facilitate analysis by coding quantitative data into numeric data. To do this, SPSS was used to determine frequencies and percentages. Some frequencies and percentages were imported from SPSS to Microsoft Excel to produce charts and figures. Frequency distributions were depicted in tables and charts.

Qualitative data were analysed thematically. Braun and Clarke (2006) define thematic analysis as a method for identifying, analysing, and reporting patterns (themes) within data. In this study, qualitative data were subjected to thematic analysis for commonly recurring and prevalent themes which assisted in answering the research questions.

Both quantitative and qualitative data were presented, analysed, interpreted and discussed through the lens of the Decomposed Theory of Planned Behaviour designed by Taylor and Todd (1995). To come up with a credible report of the findings, the researcher triangulated the questionnaire data (predominantly quantitative), curricula analysis and interview data (entirely qualitative). To achieve this, all the results including inconsistencies noted in each of the data sources were verified against each data source and conclusions were then made based on the results which were supported by most data sources.

3.5.   Conclusion

In this chapter, the researcher focused on highlighting the research designs and methods which were employed in this study to provide answers to the research questions formulated in Chapter

One. The researcher has also provided details about the data collection tools which included questionnaires, interviews and content analysis and how the participants were identified.

The next chapter (Chapter Four) will present, summarise and analyse results of the questionnaire data.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF DATA: WEB-BASED QUESTIONNAIRE

4.1. Introduction

This chapter presents, summarises and interprets the data that were collected from students and lecturers in the Faculty of Information Science and Communications at MZUNI. The researcher investigated how Web 2.0 technologies are being utilised to accomplish teaching and learning activities by students and lecturers. Findings are interpreted through the lens of the Decomposed Theory of Planned Behaviour by Taylor and Todd (1995) which is discussed in Chapter One. Apart from background and personal information, the researcher presents and interprets data collected in accordance with the research questions identified in Chapter One.

The chapter has two parts. First, it deals with the data collected from students who answered a Web-based questionnaire and second, it deals with the data collected from lecturers' responses to a Web-based questionnaire.

4.2. Presentation and interpretation of students' data

A Web-based questionnaire was sent to 186 students and 136 (73.1 %) of them responded to the questionnaire. As discussed in Chapter Three, the student questionnaire consisted of four sections (A, B, C and D) whose questions gathered data about personal information, awareness of and familiarity with Web 2.0 technologies, purposes for using Web 2.0 technologies and influencing factors for use or non-use of Web 2.0 technologies.

4.2.1. Personal information

Questions one, two and three in section A of the questionnaire gathered data about students' personal information which include their gender, department to which they belonged and their levels of study.

4.2.1.1. Gender

Seventy nine (58%) males and 57 (42%) females responded to the questionnaire. In Malawi, the enrolment ratio of females to males in universities is considerably lower and this explains why there is a disparity between females and males who responded to the questionnaire. Southern Africa Regional Universities Association (2011) reports that males more than females are enrolled for undergraduate studies in Malawian universities and the World Bank Working Paper (2010:15) reports that female enrolment has remained around 30 per cent in Malawian public universities. Another reason for the low female rate could be attributed to the fact that the ICT department has predominantly mathematics and technology-related courses and many females do not apply for this programme.

4.2.1.2. Department

Eighty three (61%) respondents are LIS students whereas 53 (39%) are students from the ICT department. ICT is one of the most difficult courses at MZUNI and consequently, some students doing this course drop out while others transfer to the LIS programme which is regarded as less tough. These are the probable reasons why the study has registered a higher number of respondents from LIS students than from their ICT counterparts.

4.2.1.3. Level of study

Of the 136 respondents, 54 (39.71%) are in level two, 47 (34.56%) are in level three and 35 (25.74%) are in level four. As students progress to higher levels, some of them drop out because they find the courses too difficult, others transfer to other faculties within MZUNI while other students fail to pay tuition fees and are therefore not registered in some academic years. These factors may account for the decline in the number of students from lower to higher levels of study.

4.2.2. Awareness of and familiarity with Web 2.0 technologies

Section B of the questionnaire consisted of questions that sought to solicit data from students on their awareness of and knowledge about various Web 2.0 technologies, the technological devices

that they used to connect to Web 2.0 technologies and the places where they accessed Web 2.0 technologies.

4.2.2.1. Awareness of Web 2.0 technologies

Data presented in Figure 3 reveal that between 80 (58.8%) and 135 (99.3%) students are aware of the existence of Facebook, Wikipedia, WhatsApp, Google Apps, Twitter, YouTube and Skype whereas only 48 (35.3%) or fewer are aware of Blogs, Podcasts, Dropbox, RSS Feeds, Viber, LinkedIn, Picasa, Flickr and Delicious. There are several reasons why students know more about some Web 2.0 technologies than others. Facebook, WhatsApp, Twitter, YouTube and Skype are embedded or can be downloaded and installed in most basic and smart phones which the majority of Malawians including students at MZUNI own. Media houses such as TV stations, newspapers and radio stations which are the major sources of general and current information for most Malawians engage with their audience using some of these Web 2.0 technologies. On the other hand, the fact that Viber and other technologies are very new in Malawi and that they mimic functionalities of some applications such as Facebook and WhatsApp can be the reason they are not known. These findings correspond well with those reported in India by Majhi and Maharana (2011) who also found that most of the Indian university community had the necessary knowledge of certain Web 2.0 technologies particularly Facebook, Wikis and Twitter which had their levels of awareness pegged at 98%, 95% and 91% respectively.
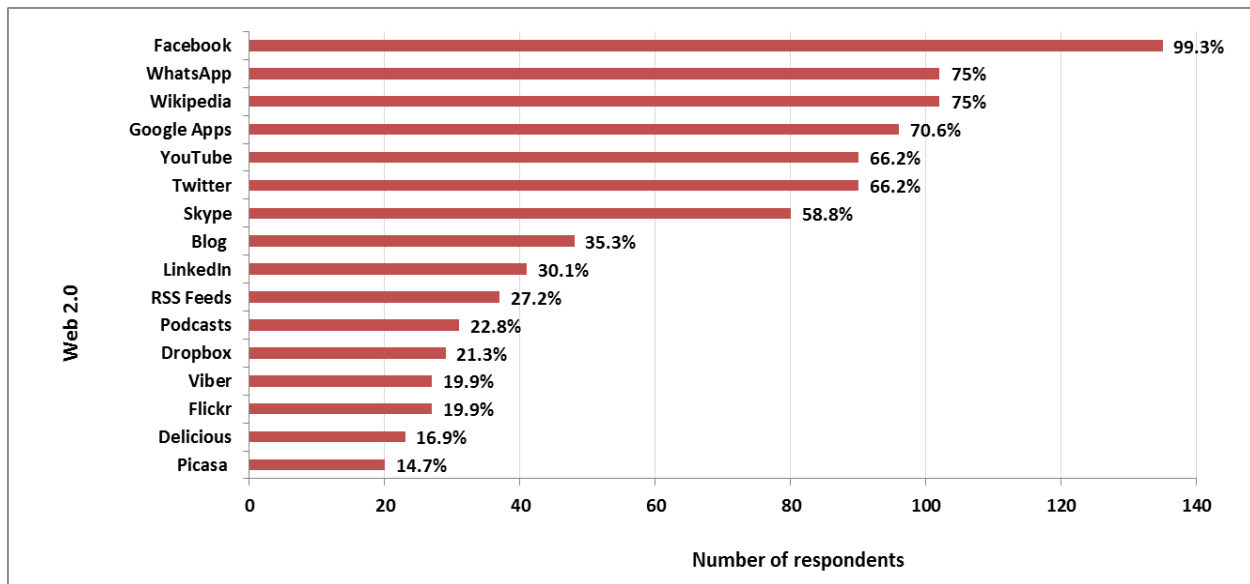
Figure 3. Awareness of Web 2.0 technologies amongst students (N=136)

4.2.2.2. Proficiency with the use of Web 2.0 technologies

Most responses are in the "very incompetent" category followed by "very competent or competent" categories. Figure 4 below summarises the students' proficiency in using Web 2.0 technologies.

Between 80 (58.8%) and 129 (94.8%) students indicated that they are very competent or competent in using Facebook, Wikipedia, Google Apps, WhatsApp, YouTube, Skype and Twitter. Correspondingly, these are the very same Web 2.0 technologies which most students indicated they are aware of as indicated in section 4.2.2.1 above. Worth noting is that the combined number of students who indicated "very competent or competent" and "novice" in using RSS Feeds outnumbered those who said they are aware of this technology. This inconsistency might be a result of students' failure to understand the meaning of "novice". A large number of students with percentages ranging from 65.4 to 89.0 indicated they are very incompetent in using Delicious, Flickr, Picasa, LinkedIn, Viber, Dropbox, Podcasts, RSS Feeds and Blogs. A further analysis of the findings revealed that almost all the students who used LinkedIn were in level four probably because they were in final year and were using this Web 2.0 to connect with potential employers.
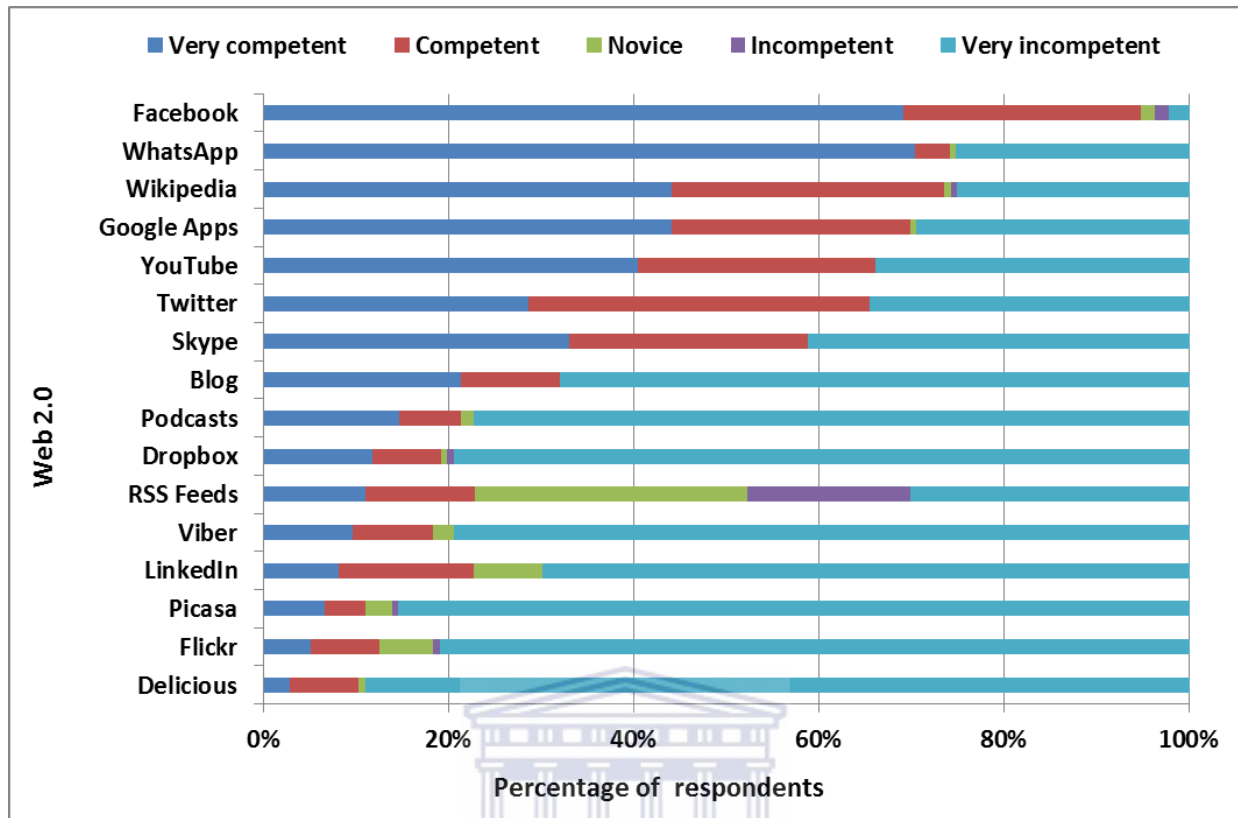
Figure 4. Students' proficiency with the use of Web 2.0 technologies (N=136)

4.2.2.3. Devices used to connect to Web 2.0 technologies

One hundred and twenty three (90.4%) students use laptops, 121 (89%) use smart phones and 97 (71.3%) use desktop computers to access Web 2.0 technologies. Only 18 (13.3%) students use iPads or tablets to access Web 2.0 technologies. See Figure 5 below. Chaputula (2012:367) reports that "The Mzuzu University Library has benefited from donations of computers from a number of sources over the years" and he adds that "Malawi has seen a huge penetration of mobile phones over the last decade". Such claims help explain the reason desktop computers and smart phones are among the most used devices to connect to Web 2.0. It is not surprising that iPads or tablets are the least used devices by students because Nicholson (2011) claims that although there are increased innovative mobile applications, the majority of Africans do not have the luxury of iPads.
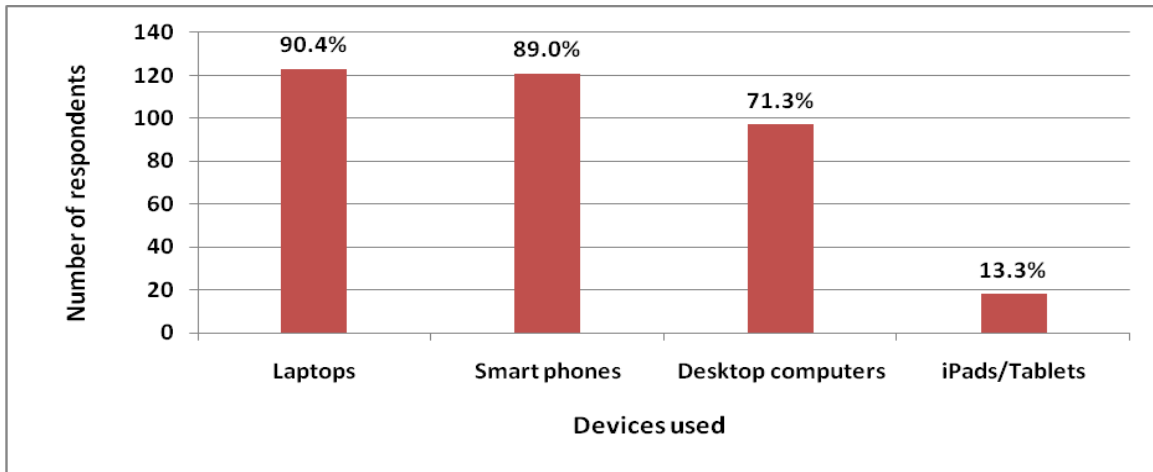
Figure 5. Technological devices used by students to access Web 2.0 technologies (N=136)

4.2.2.4. Web 2.0 technologies access points

When asked to indicate places or points from within and without the university campus where they accessed Web 2.0 technologies, Figure 6 shows that 106 (83.5%) students selected the library, 95 (74.8%) selected the American Corner Internet Café and 69 (54.3%) indicated the Internet Café outside the university campus. Only 42 (33.1%) students use the faculty computer laboratory and the modem from the ISP at home and eight (6.3%) students use hot spots on campus. The highest number of students who access these technologies in the library confirms comments made by the researcher in the problem statement (see section 1.4 of Chapter One) that MZUNI Library has an Internet room where students access Internet at a much subsidised-fee.

The probable reason the American Corner Internet Café is amongst the most used is that apart from being strategically and conveniently located next to the university library, it has state of the art computers supplied by the American Embassy and it provides "free Internet services to undergraduate students searching for information about study opportunities in the USA universities and colleges" (Embassy of the United States, 2014).

The researcher's expectation, having been a lecturer there, was that since the faculty computer laboratory was primarily established to serve students in this Faculty, it would be extensively used by students to access Web 2.0 technologies but these results have proved the assumption wrong as the Faculty computer laboratory has turned out to be the least used Web 2.0 access point. The reason is that due to a shortage of classrooms at MZUNI, the faculty computer

laboratory is constantly being used as a learning venue by students from other faculties and departments thereby displacing students in the Faculty of ISC. A very small number of students use hot spots on campus to access these technologies because Wi-Fi is almost non-existent at MZUNI as it is only accessible within the library's Internet room implying that only students who frequent it are the ones who use it. Worse still, students are not allowed to use their personal laptops to access this Wi-Fi. A close analysis of the responses revealed that the 123 (90%) students who said they used laptops to access these technologies in section 4.2.2.4 are those who use the American Corner Internet Café, the Internet Café outside the university and an ISP modem at home where they are able to connect to the Internet using Wi-Fi.
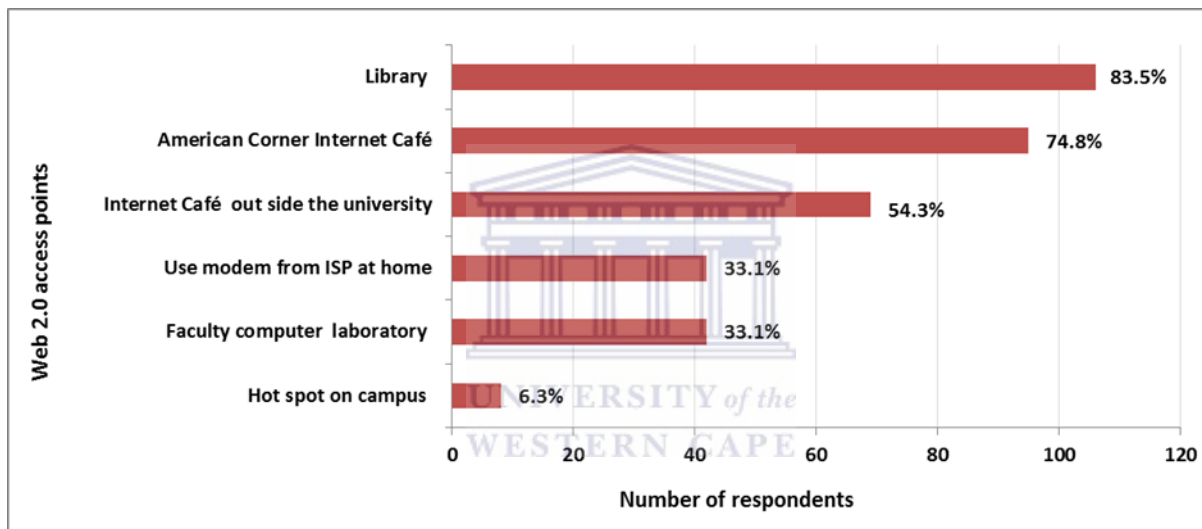
Figure 6. Students' Web 2.0 access points (N=136)

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

Three questions in Section C of the questionnaire aimed at soliciting data from students about the general and specific educational use of Web 2.0 technologies and the Web 2.0 technologies that they used most to accomplish educational activities.

4.2.3.1. General use of Web 2.0 technologies

As depicted in Figure 7, it is observed that all 136 (100%) students use Web 2.0 technologies for school work, 124 (92.5%) for social activities and 75(51.1%) use these technologies for other purposes. Only 23 (17.2 %) respondents use these technologies to hunt for jobs. The "social activities" category was meant to be an 'umbrella' term encompassing various activities such as

connecting with new friends, chatting with friends and entertainment but some students seemed not to realise this because almost all the 75 (51.1%) students who indicated "other" mentioned entertainment. From the researcher's own experience, Web 2.0 technologies such as Facebook, Twitter and WhatsApp are commonly used by students in Malawi to instantly connect with peers currently at the university or at home, to search and locate old friends, to post photographs and to watch movies and documentaries on YouTube. This could be the reason the category of social activities registered a high percentage. A deeper analysis of the responses revealed that the students who use Web 2.0 technologies for job hunting are in level four. This corresponds well with the results reported in section 4.2.2.2 where it was found that students in the same level are mostly able to use LinkedIn which is usually used to connect with potential employers.
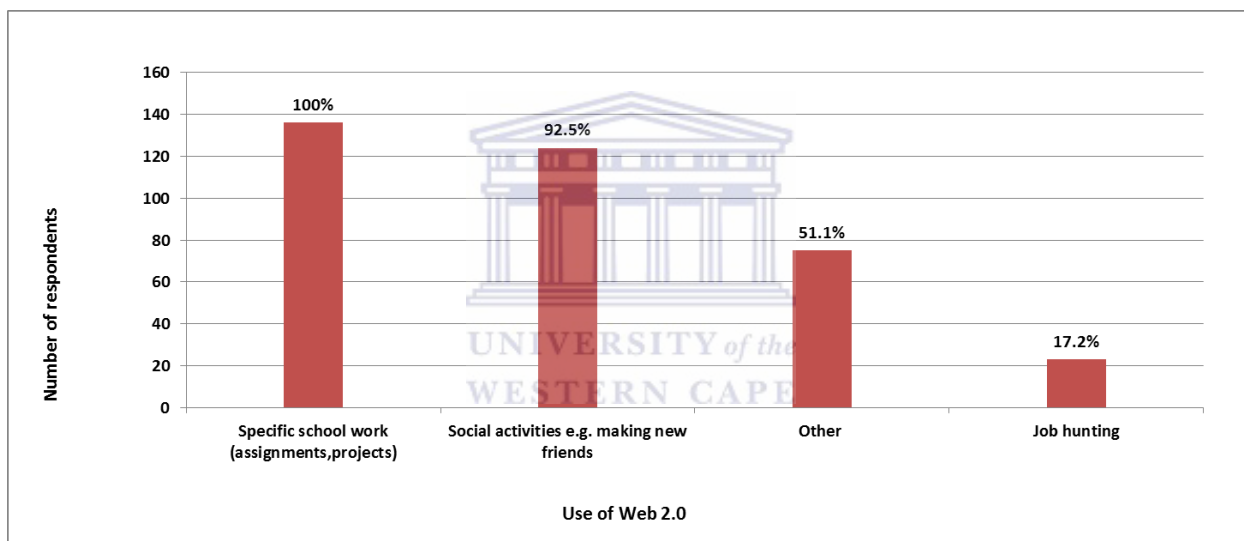
Figure 7. General use of Web 2.0 by students (N=136)

4.2.3.2. Academic activities accomplished using Web 2.0 technologies

Responses presented in Figure 8 below, show that students use these technologies to accomplish five major academic activities. Between 69 (50.7%) and 128 (94.1%) students use these Web 2.0 technologies to search for information, to communicate with lecturers, to submit assignments, to communicate with friends on academic work and to share content with fellow students. Sixty six (45.5%) use these technologies to work in collaboration with other students. The 64 (47%) students who selected "other" mentioned two main academic activities: to keep updated on areas of their subject interest and to improve their technological skills. Figure 8 shows further that only 48 (35.2%) students use Web 2.0 technologies to connect with

professionals in their field of study. An analysis of the responses show that of the 48 (35.2%), 45(93.7%) students are in level four thereby confirming responses in section 4.2.3.1 which showed that level four students mostly use Web 2.0 technologies to hunt for jobs.

Responses realised in this section substantiate those noted in section 4.2.3.1 which showed that all 136 (100%) students use Web 2.0 for academic purposes. Additionally, these findings deepen observations made by Eyyama, Menevis and Dogruer (2011) that Web 2.0 technologies are primarily used to facilitate communication amongst students themselves and with their lecturers. Likewise, Gaffar, Singh and Thomas (2011) found that students at a Caribbean University accessed their Facebook and Twitter accounts at least twice per day in order to communicate with fellow students, lecturers, relatives and friends.
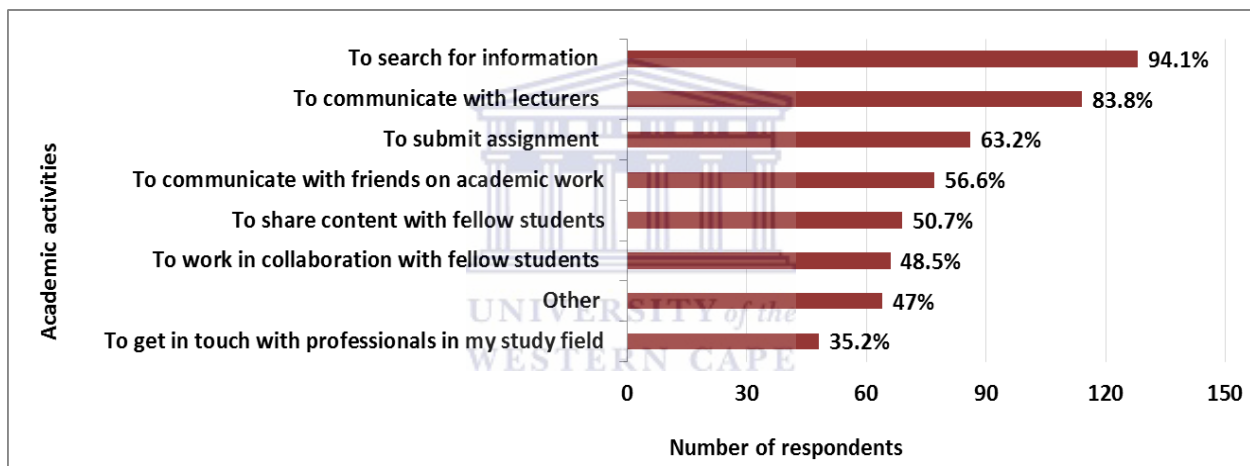
Figure 8. Students' academic activities accomplished using Web 2.0 technologies (N=136)

4.2.3.3. Web 2.0 technologies used most to accomplish academic activities

Responding to question number 10 which required them to indicate the Web 2.0 technologies that they used to accomplish their educational activities by selecting from the categories that ranged from '"most used" to "never used", it is revealed, as shown in Figure 9 below, that responses are dominated with the "never used" category followed by the "most used" category. Specifically, Between 66 (45.8%) and 95 (69.9%) students use Wikipedia and WhatsApp, 90 (66.2%) use Google Apps and 66 (45.8%) use YouTube. Conversely, the majority of students (percentages ranging from 66.2 to 91.9) indicated that they had never used RSS Feeds, Podcasts, Skype, Twitter, LinkedIn, Blogs, Picasa, Flickr, Viber, Delicious and Dropbox. Surprisingly, of

129 (94.1%) students who indicated they are very competent or competent in using Facebook as can be seen in section 4.2.2.2, Figure 9 shows that only 46 (33.9%) students either use it most or occasionally for school related work. In Malawi, Facebook and other social networks are primarily regarded too informal and are generally perceived as virtual platforms for socialising, not for learning.
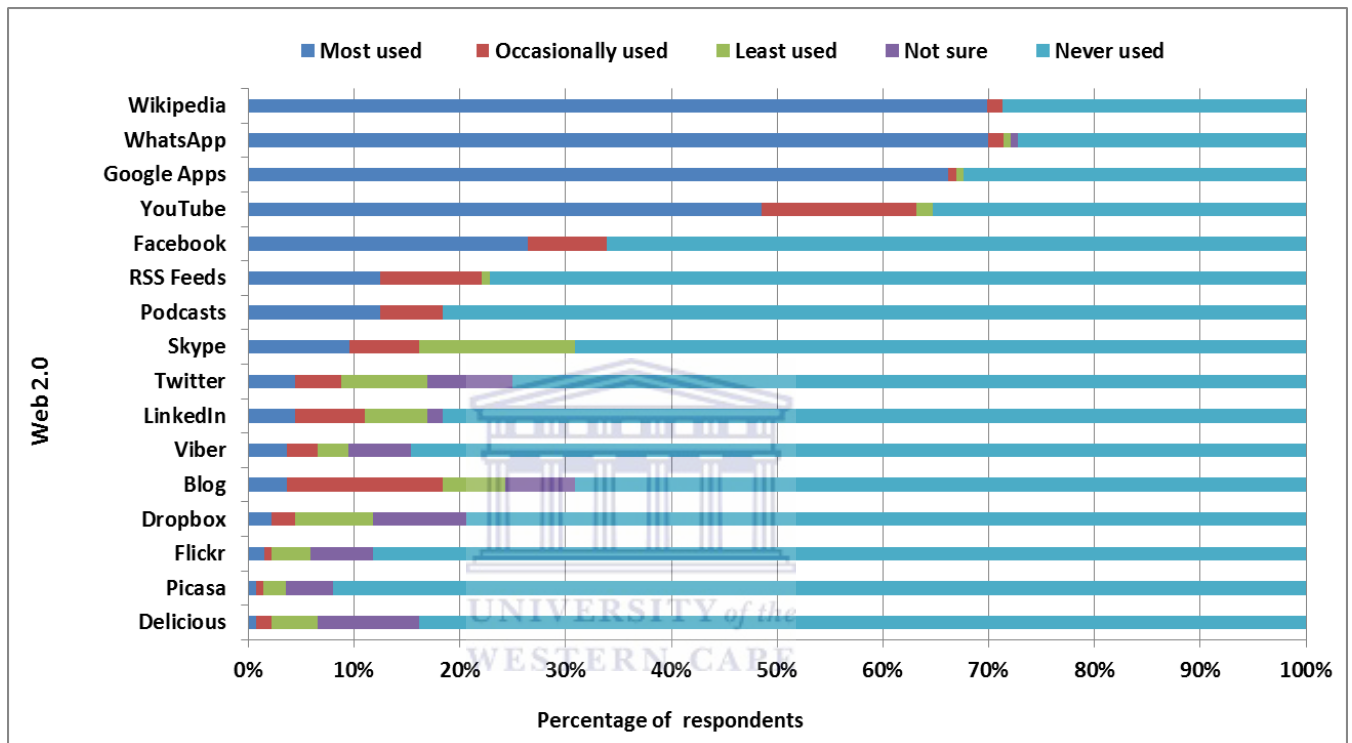
Figure 9. Web 2.0 technologies used to accomplish academic activities by students (N=136)

4.2.4. Factors for use or non-use of Web 2.0 technologies in academic activities

Researchers such as Gaffar, Singh and Thomas (2011) opine that although it is increasingly becoming common knowledge that Web 2.0 technologies come along with various benefits and opportunities in teaching and learning, factors that affect their adoption may vary from country to country and from university to university. Thus, questions 11 and 12 of section D of the questionnaire solicited data from students about the factors that influenced them to use or not to use Web 2.0 technologies respectively.

4.2.4.1. Reasons for use of Web 2.0 technologies in academic activities

Data displayed in Table 2 below, reveal that students use these technologies because of three major reasons. One hundred and thirty one (96.3%) "strongly agree" or "agree" that they use Web 2.0 technologies because they have knowledge and ability, 122 (89.7%) "strongly agree" or "agree" they use these technologies because they fit with their learning and finally, 77 (56.6%) students "strongly agree" or "agree" they use these technologies because they access them for free.

These responses resonate well with the Decomposed Theory of Planned Behaviour by Taylor and Todd (1995). There is compelling evidence that some constructs of the DTPB positively influence students to adopt these technologies whereas others have no effect. Students have adopted Web 2.0 technologies because they are able to easily understand and operate them (ease of use) and that these technologies fit well with their learning practices and experiences (compatibility).

Table 2. Reasons for students' use of Web 2.0 technologies in academic activities (N=136)

Reasons for use	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	f	%	F	%	f	%	f	%	f	%
I have the knowledge and ability to use Web 2.0.	99	72.8	32	23.5	4	2.9	1	.7	0	0
I use Web 2.0 technologies because they fit well with the way I learn	86	63.2	36	26.5	7	5.1	5	3.7	2	1.5
I access them for free.	51	37.5	26	19.1	24	17.6	21	15.4	14	10.3
I use them because my lecturers want me to use them.	21	15.4	27	19.9	33	24.3	22	16.2	33	24.3
I use them because my fellow students want me to use them.	13	9.6	16	11.8	18	13.2	39	28.7	50	36.8

4.2.4.2. Reasons for non-use of Web 2.0 technologies in academic activities

Table 3 shows that students' responses are evenly distributed from "strongly agree" to "strongly disagree". However, two main reasons for non-use can be noted. Seventy four (54.4%) students "strongly agree" or "agree" that they do not use Web 2.0 technologies because the Internet is very poor and 51 (37.5%) students "strongly agree" or "agree" that they do not use these technologies because they put their privacy at risk. Surprisingly, only 43 (31.6%) students

indicate that frequent electricity outages discourage them from using Web 2.0 technologies, contradicting findings by Nyirongo (2009) who found that power outages at MZUNI discouraged lecturers from adopting the Internet in their academic activities. As observed in 4.2.2.3, 121 (89%), students use smart phones to access Web 2.0 technologies implying that they probably charge batteries of their phones at home and can access the Internet all day without being affected by electricity hitches experienced on campus.

Although 123 (90%) students indicated that they use laptops to access Web 2.0 as reported in section 4.2.2.3, Table 3 reveals that 48 (35.3%) students do not use these technologies due to lack of access to computers. The researcher believes that the students meant to say that computers in the library where 106 (83.5%) students access these technologies as reported in section 4.2.2.4 are insufficient, hence the seeming inconsistency.

Table 3. Reasons for students' non-use of Web 2.0 technologies in academic activities (N=136)

Reasons for non-use	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	f	*%*	*f*	*%*	*F*	*%*	*f*	*%*	*f*	*%*
I do not use Web 2.0 because the Internet is very poor.	42	30.9	32	23.5	22	16.2	27	19.9	13	9.6
I think using Web 2.0 technologies puts my privacy at risk.	31	22.8	20	14.7	23	16.9	34	25.0	28	20.6
I do not use Web 2.0 because there are frequent electricity outages.	22	16.2	21	15.4	24	17.6	41	30.1	28	20.6
I do not have access to computers	14	10.3	34	25.0	22	16.2	28	20.6	38	27.9
I do not use Web 2.0 because of lack of technical support.	11	8.1	25	18.4	20	14.7	31	22.8	49	36.0
I am very busy and it takes me too much time to use these technologies.	7	5.1	14	10.3	23	16.9	65	47.8	27	19.9
I do not have necessary skills to use such technologies.	6	4.4	11	8.1	19	14.0	34	25.0	66	48.5

This section (4.2) has presented, summarized and analysed data about students' personal information, awareness of and familiarity with Web 2.0 technologies, purposes for using Web 2.0 technologies and influencing factors for the use or non-use of Web 2.0. The next section presents, summarises and analyses data of the lecturers who answered the questionnaire.

4.3. Presentation and interpretation of lecturers' data

This section presents data collected from lecturers who answered the Web-based questionnaire. A Web-based questionnaire was sent to 19 lecturers. Of the 19, 17 (89.4%) lecturers responded to the questionnaire. The lecturer questionnaire was numbered from LQR 1 to LQR 17 where LQR represents Lecturer Questionnaire Respondent followed by the number of the respondent. Apart from section D which was exclusive to lecturers, sections A, B, C and E of the questionnaire asked similar questions to those asked to students as explained in section 4.2. The aim was to note the extent to which the responses from lecturers correlated with those provided by students so as to achieve more objective results.

4.3.1. Background and personal information

Section A of the questionnaire solicited data from lecturers about their gender, department to which they belonged, their qualification and designation.

4.3.1.1. Gender, department, qualification and designation

Sixteen (94.1%) males and one (5.9%) female responded to the questionnaire. As alluded to in section 4.2.1.1, this is not very surprising for a Malawian institution since the number of females who make it to university is very low. It is therefore expected that low enrolment levels of female students could result in fewer females being recruited for any position in universities.

Nine (52.9%) lecturers are from the ICT department and eight (47.1%) lecturers from the LIS department. The only female who answered the questionnaire is from the LIS department.

Figure 10 below shows that predominantly, there are nine (58.8%) lecturers with a master's degree, one (5.9%) PhD holder and seven (41.2%) lecturers have bachelor's degrees. It is unusual for institutions of higher learning to be dominated by academic staff whose maximum qualifications are bachelor's degrees. The situation at MZUNI is a result of the university's policy that faculties and departments should recruit their own fresh graduates who have a passion for teaching and irresistible interest in the profession so that they can be sent for further training. In fact, the researcher is a beneficiary of this policy.

In terms of rank, there are eight (47%) lecturers, five (29.4%) associate lecturers and there are two (11.8%) assistant and senior lecturers. There are only two senior lecturers because most lecturers at MZUNI dedicate their time to teaching than conducting research which is a requirement for their promotion to the higher ranks. The same reason applies to why there is no professor in the Faculty.
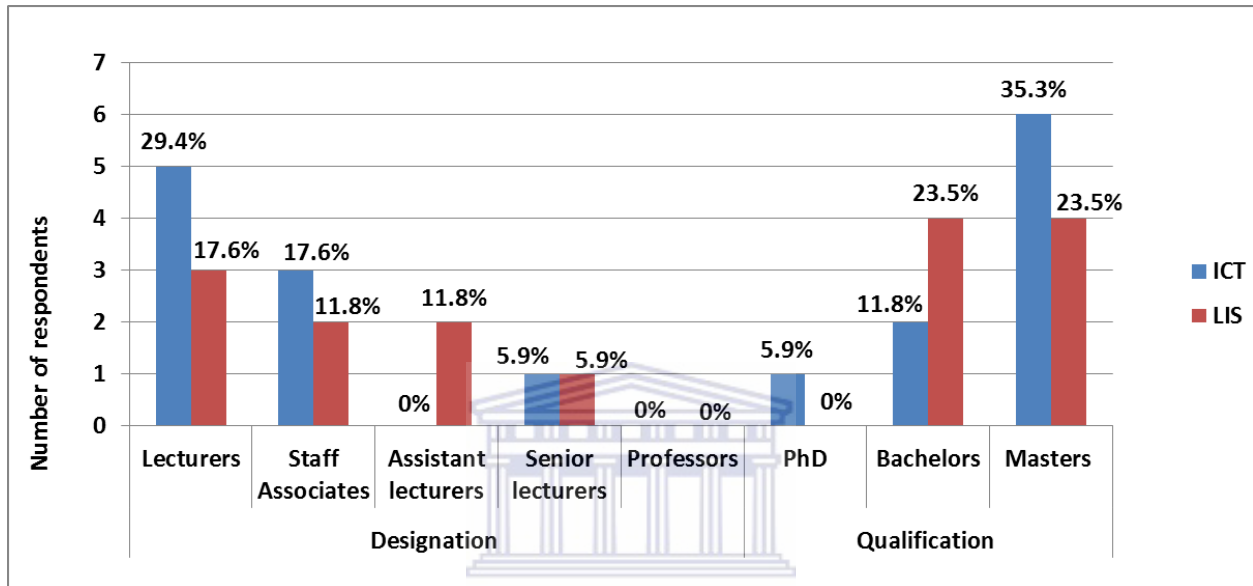
Figure 10. Qualification and designation of lecturers (N=17)

4.3.2. Awareness of and familiarity with Web 2.0 technologies

 Questions five, six, seven and eight of the questionnaire gathered data about how aware and familiar lecturers are with Web 2.0 technologies. The aim was to note if lecturers' awareness and knowledge translated into actual use of these technologies in their academic work.

4.3.2.1. Awareness of Web 2.0 technologies amongst lecturers

Lecturers were provided with a list of Web 2.0 technologies from which they were required to select the ones they knew. Figure 11 below, shows that between 11 (64.7%) and 17 (100%) lecturers are aware of Facebook, Twitter, Wikipedia and LinkedIn, Dropboox, Podcasts, RSS Feeds, Flickr, Blog, YouTube, Skype, WhatsApp and Google Apps. Only seven (41.2%) lecturers are aware of Delicious and Picasa, and eight (47.15%) are aware of Viber.

Unlike students' responses (see section 4.2.2.1.), all lecturers are aware of LinkedIn. 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 of "300 million members in over 200 countries and territories around the globe". Responses of the present study align with those reported in the USA by Ajjan and Hartshorne (2008) who also found that a good number of lecturers were aware of Blogs, RSS Feeds and most social networks.
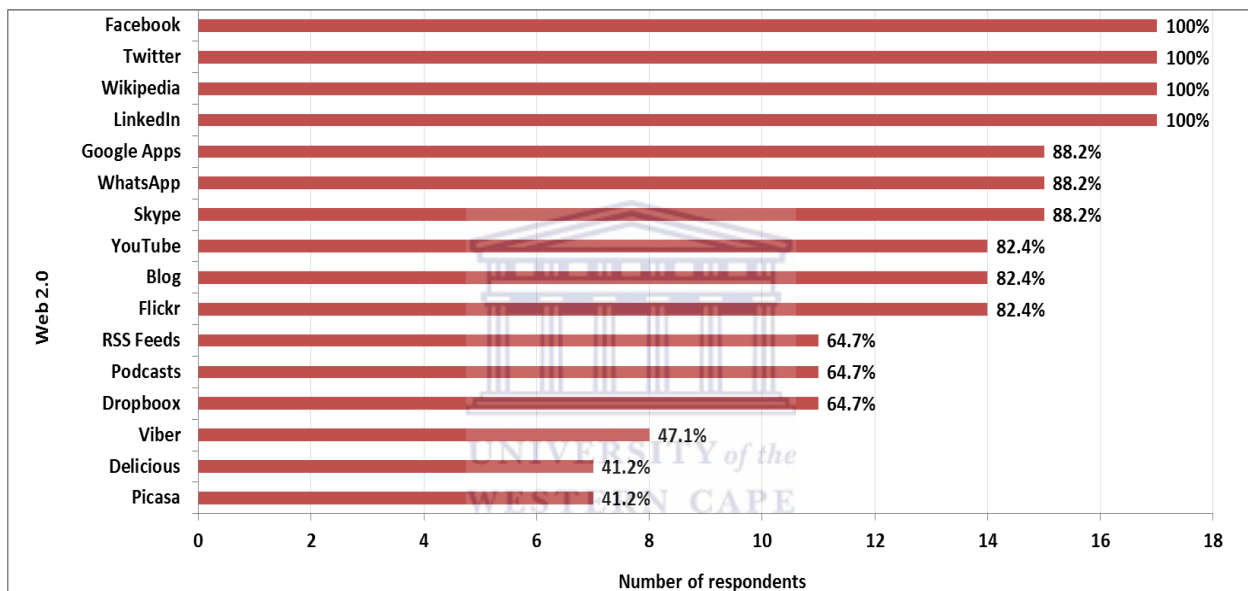
Figure 11. Awareness of Web 2.0 technologies amongst lecturers (N=17)

4.3.2.2. Proficiency with Web 2.0 technologies

Overall, Figure 12 reveals that most responses are dominated by the categories of "very competent" or "competent" followed by "very incompetent" or "incompetent", differing from students' responses as observed in section 4.2.2.2 where a large number of the responses were in the categories of "very incompetent" or "incompetent" followed by "very competent" or "competent". Lecturers are normally well read, more informed and possibly more innovative than students and, in some cases, it is usually easy for them to learn some of these technologies independently. In fact, being teachers, lecturers are expected to be more knowledgeable than students. Notably, the majority of lecturers (percentages ranging from 52.9 to 88.4) are "very competent" or "competent" in using Facebook, Skype, YouTube, Google Apps, Wikipedia,

Twitter, WhatsApp, LinkedIn, Blog and Dropbox. However, eight (47%) lecturers or fewer are able to "competently" or "very competently" use Podcasts, Viber, Flickr, Delicious, RSS Feeds and Picasa.
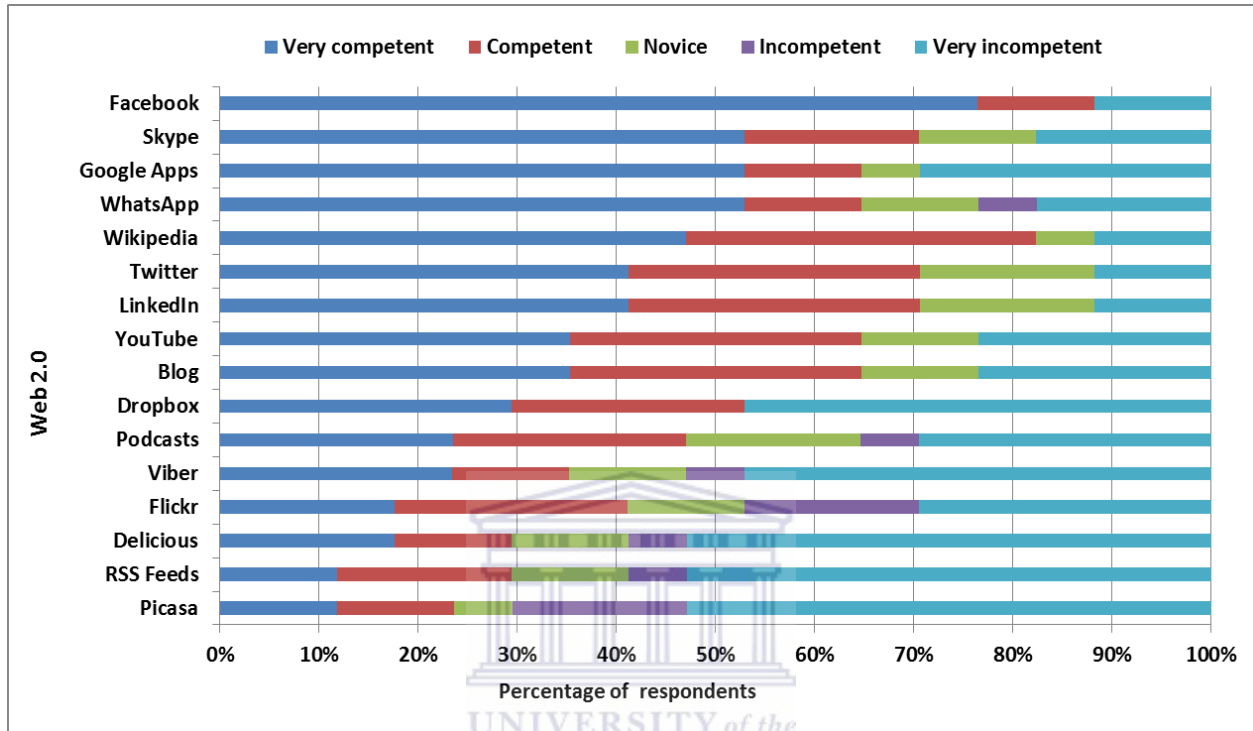
Figure 12. Lecturers' proficiency with Web 2.0 technologies (N=17)

4.3.2.3. Devices used to connect to the Web 2.0 technologies

When asked to select the devices that they used to connect to Web 2.0 technologies, 14 (82.4%) lecturers indicated that they use laptops, desktop computers and smart phones. Only four (11.2%) lecturers use iPads or tablets to access these technologies. These responses confirm and contrast findings by Mtingwi and Van Belle (2012) who report that in Malawi, the most common technologies in use are the mobile technologies more especially mobile phones, than laptops and unlike this study, the two researchers also include iPads in the list. The difference may be because Mtingwi and Van Belle (2012) targeted respondents who were mainly ICT officers, marketers and administrators working in government and some private organisations who are usually provided such ICT gadgets by their employers as part of their employment benefits. Lecturers in Malawi do not enjoy such benefits.

4.3.2.4. Web 2.0 access points

Fifteen (88.3%) lecturers access Web 2.0 technologies in offices, 10 (58.8%) in the library, six (35.2%) use modems from their ISP at home, and five (29.4%) access these technologies in the American Corner Internet Café and hot spots on campus. Only four (23.5%) lecturers access these technologies in the faculty computer laboratory and in Internet Café outside the university campus. See Figure 13. Unlike students who mainly use the library and the American Corner Internet Café as seen in section 4.2.2.4, very few lecturers use these points. The reason is that most lecturers have computers in their offices which are connected to the Internet. The highest number of lecturers accessing these technologies in offices confirms observations made by the researcher in the research problem (see section 1.4 of Chapter One) that all lecturers have computers in their offices which are connected to the Internet. The reason suggested in section 4.2.2.4 for the underutilisation of the faculty computer laboratory by students also applies to why only a small number of lecturers use it as well.
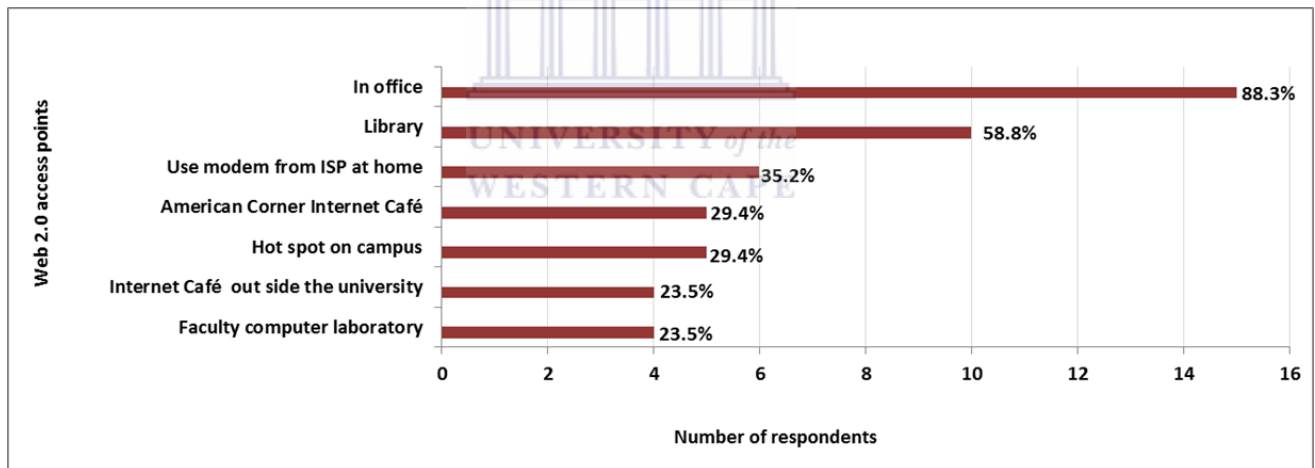
Figure 13. Lecturers' Web 2.0 access points (N=17)

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

There were two open-ended questions and one closed-ended question in section C of the questionnaire which 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 (section 4.3.2) and the actual use in academic activities.

4.3.3.1. General use of Web 2.0 technologies

This opened-ended item required respondents to cite general activities that they performed using Web 2.0 technologies. Most lecturers mentioned that they use these technologies for the following: "chatting with friends" (LQR 5), "teaching" (LQR 7), "multimedia sharing" (LQR 9), "current affairs on political issues" (LQR 14) and "hunting for jobs" (LQR 17).

4.3.3.2. Specific education activities performed using Web 2.0 technologies

Lecturers were asked an open-ended question about the specific educational activities that they performed using Web 2.0 technologies. The following are the dominant activities: "handing out assignments to students" (LQR 1), "receiving feedback from students" (LQR 4), "e-learning" (LQR 8), "uploading lecture notes" (LQR 11), "searching for content" (LQR 12), "receiving feeds on various subjects" (LQR 13), "preparing lecture notes using Google Apps" (LQR14), "using Wikipedia to search for information" (LQR 15), "using YouTube videos to enhance concept explanation", (LQR 16), "using Delicious to tag information related to topics being taught and sharing it with colleagues and students, and using Wikis to present course information and initiate interactive discussion" (LQR 17) and "using Dropbox to store lecture notes and scheduling activities using Google Calendar" (LQR 1). These responses corroborate students' responses provided in section 4.2.3.2 which indicated that they use Web 2.0 technologies to communicate with lecturers, to search for content and to submit assignments.

4.3.3.3. Web 2.0 technologies most used to accomplish academic activities

Data presented in Figure 14 reveal that the most used Web 2.0 technologies with a score between 10 (58.8%) and 13 (76.5%) include Wikipedia, YouTube, Blogs, Google Apps and Twitter. Responses "never used" dominate Facebook, Delicious, WhatsApp, RSS Feeds, Skype, LinkedIn, Viber, Picasa, Dropbox and Flickr. Unlike students, most lecturers do not use WhatsApp for academic purposes implying that students use this technology to communicate amongst themselves.

The findings show that despite lecturers indicating they are aware of and are able to competently use these technologies as revealed in sections 4.3.2.1 and 4.3.2.2, most lecturers are not using some Web 2.0 technologies for academic purposes. The findings seem to suggest that the lecturers' awareness and knowledge of Web 2.0 do not necessarily translate into actual use of these technologies in their academic work.
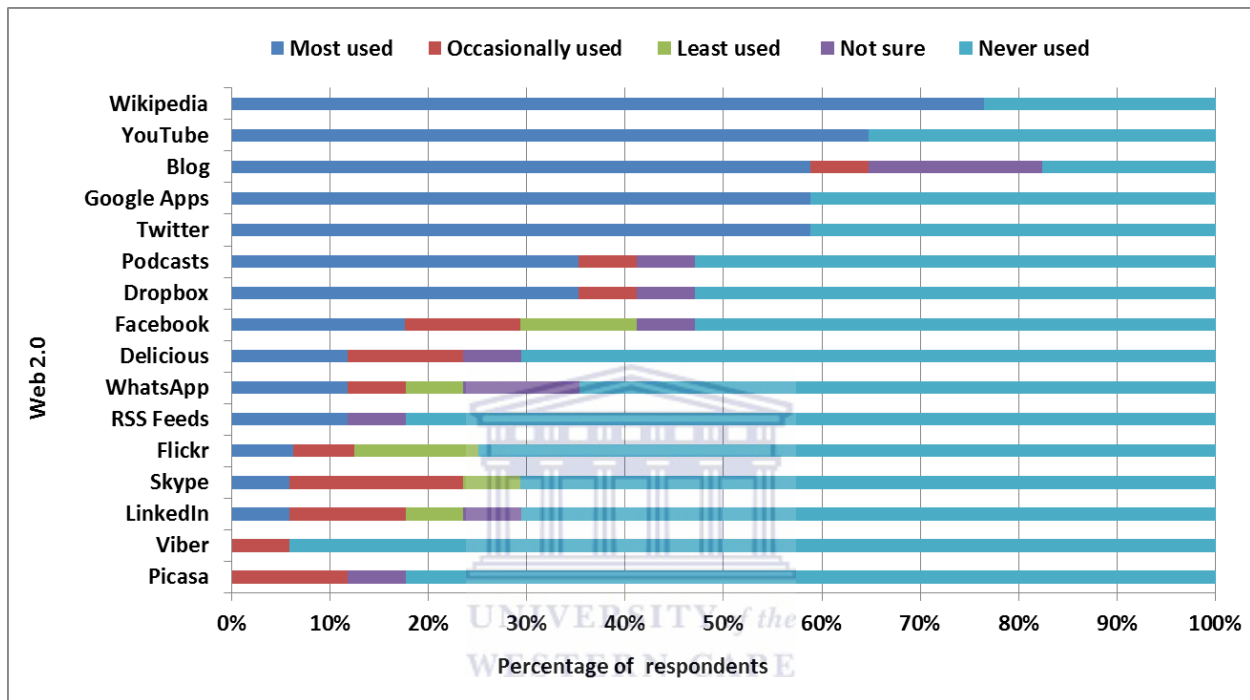
Figure 14. Web 2.0 technologies used to accomplish academic activities by lecturers (N=17)

4.3.4. Benefits of Web 2.0 technologies in teaching and learning

Unlike other sections of the questionnaire that consisted of questions similar to those asked of students, questions in section D were exclusive to lecturers. Lecturers answered both closed and opened-ended questions about the benefits of Web 2.0 technologies in teaching and learning in general, when applied to a classroom environment and the necessity of exposing students to Web 2.0 technologies. Questions were somewhat similar and it was therefore expected that most responses would support each other.

4.3.4.1. Benefits associated with Web 2.0 technologies in teaching and learning

The researcher asked lecturers to indicate the extent to which they agreed with the benefits listed in Table 4 about Web 2.0 technologies in teaching and learning. It is clear that between 13 (76.5%) and 15 (88.3%) lecturers "strongly agree" or "agree" with all the benefits that are listed.

Table 4. 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
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	0	0	2	11.8

Lecturers were also asked to mention other benefits in addition to those listed in Table 4 and their views are as follows:

- "Help me search for information" (LQR 4);
- "Web 2.0 technologies help me explain difficult concepts by using videos uploaded on YouTube" (LQR 6);
- "Help my students to participate actively through interactivity exercises offered by some technologies such as Wikis and Google Documents" (LQR 9);
- "Help me receive instant feedback from students and colleagues" (LQR 10);
- "Facilitate storage and ease of retrieval of the materials. For example, I use Dropbox to store lecture notes" (LQR 11);
- "Help my students to learn at their own pace anytime" (LQR15); and
- "Help my students communicate anytime regardless of physical barriers" (LQR 16).

Based on these responses, it can be summed up that lecturers reap five main benefits from Web 2.0 technologies: they facilitate search for information, facilitate lecturer to lecturer and lecturer to student communication, make teaching easier aided by YouTube, facilitate storage of teaching resources viz. lecture notes and eliminate distance as a barrier to collaborative learning. These responses corroborate responses from students reported in section 4.2.3.2 and those provided by lecturers in section 4.3.3.2 where both groups indicated that they mostly use these technologies to communicate, to search for information and that YouTube is used to understand some concepts. 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 institutions of higher education through increased student lecturer communication, increased interaction between academic staff and students and increased student to student interactions within the department.

4.3.4.2. Advantages of integrating Web 2.0 technologies in a classroom environment

Question number 14 required lecturers to express their opinions about the advantages of integrating Web 2.0 technologies in a classroom environment. It is clear from Table 5 that between 10 (58.8%) and 16 (94.1%) lecturers either "strongly agreed" or "agreed" with all the advantages that are listed

Table 5. Advantages of adopting Web 2.0 technologies and in a classroom (N=17)

Advantages	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*
They help me receive immediate feedback from my students.	13	76.5	3	17.6	0	0	0	0	1	5.9
They help me post my teaching resources (video, slides etc.) online.	13	76.5	1	5.9		2	11.8	0	1	5.9
They help me create a more accessible, portable, durable, and interactive educational portfolio.	10	58.8	2	11.8	4	23.5	0	0	1	5.9
They help my students to develop skills and capabilities for working in collaboration.	10	58.8	4	23.5	2	11.8	0	0	1	5.9
They help me create information resources and share content with my students.	9	52.9	5	29.4	2	11.8	0	0	1	5.9
They help me better identify students' interests and use of teaching resources.	7	41.2	3	17.6	5	29.4	1	5.9	1	5.9

From a similar item but open-ended, lecturers mentioned the following advantages:

- "They help my students learn from various teaching methods" (LQR 1);
- "They help me learn how to design interactive content for students" (LQR 2);
- They help my students easily access additional reading resources for the lectures" (LQR 7);
- "It makes students free to discuss issues in a freer environment since there is no one patronising them (no shyness)" (LQR 11); and
- "I think they can captivate interest amongst learners" (LQR 17).

It is clear that these responses correlate with those in section 4.3.4.1, the benefits of using Web 2.0 in teaching and learning. Deservedly, there is one advantage worth highlighting: most lecturers are of the view that Web 2.0 technologies motivate shy or slow-learning students to excel in class because such students are accorded an opportunity to learn freely and at their own pace. This underlines the power of Web 2.0 technologies such as YouTube which allow such students to learn at their own convenience and pace. These responses endorse the suggestions made by Farkas (2012:85) 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 differences.

4.3.4.3. Reasons for exposing students to Web 2.0

Lecturers were asked to express their thoughts as to why students should be exposed to various Web 2.0 technologies and most lecturers came up with statements along the lines of the following:

- "To expose students to technological learning styles other than the traditional ones so that they can choose the ones they prefer" (LQR 3);
- "Equip learners with technology as core means of learning as they strive to become lifelong and independent learners" (LQR 12);
- "In this digital age, the generation of students we have are more interested in technology gadgets and facilities hence, the need to motivate them in schools" (LQR 9); and
- "To prepare students for work places as technology is becoming a must" (LQR 13).

In one statement, responses reveal that it is necessary to expose students to Web 2.0 in order to: introduce students to diverse technological learning styles, instil independent and lifelong learning in students, capitalise on the students' growing interest in ICT and to equip students with Web 2.0 skills and knowledge in readiness for their work places. The fact that all 17 (100%) lecturers mentioned the need to prepare students for their workplace highlights the importance of integrating Web 2.0 technologies in teaching and learning. Such responses are not surprising because some of the graduates from the LIS department at MZUNI are employed by telecommunication companies and libraries where the use of these technologies is said to be prevalent.

4.3.5. Factors for use and non-use of Web 2.0 technologies in teaching

The aim of items in section E of the questionnaire was to gather data about the factors that influenced lecturers to use or not use Web 2.0 technologies. Similar items were put to students. It was therefore necessary to ask lecturers the same so as to reveal if the responses correlated or not.

4.3.5.1. Reasons for use of Web 2.0 technologies in teaching

The researcher provided the lecturers with a list of six reasons for which they were asked to express their opinions about how they were encouraged to use Web 2.0 technologies. As shown in Table 6 below, between 13 (76.5%) and 15 (88.4%) lecturers either "strongly agree" or "agree" with four of the six reasons that are listed.

Table 6. Reasons for lecturers' use of Web 2.0 technologies in academic activities (N=17)

Reasons for use	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	f	*%*	*f*	*%*	*F*	*%*	*f*	*%*	*f*	*%*
I use them because I am personally comfortable using them.	14	82.4	1	5.9	1	5.9	0	0	1	5.9
I have the knowledge and ability to use Web 2.0.	13	76.5	3	17.6	1	5.9	0	0	0	0
I access them for free.	12	70.6	2	11.8	2	11.8	0	0	1	5.9
I use Web 2.0 technologies because they fit well with the way I teach.	11	64.7	2	11.8	3	17.6	0	0	1	5.9
I use them because my head of department and the dean require me to use them.	1	5.9	2	11.8	0	0	0	0	14	82.4
I use them because students want me to use them.	1	5.9	2	11.8	1	5.9	0	0	13	76.5

A follow-up open-ended question required the lecturers to provide any other reasons that encouraged them to use these technologies; the following are the most common sentiments:

- "They make teaching and learning convenient, easier and relevant" (LQR 5);
- "It is part and parcel of ICT development so as an ICT lecturer, I believe it is good to go with the development" (LQR 10).
- "I have good Internet facility at home that allows me to explore and practice using these technologies" (LQR 14); and
- "I am in the field of information science so they are part of my field of specialisation" (LQR 15).

Responses show that compatibility, perceived usefulness, ease of use, self-efficacy and technology facilitating resource are the main constructs of DTPB model that positively influence lecturers to adopt these technologies. However, by carefully linking the responses with those of students in section 4.2.4.1, it can be seen that self-efficacy overrides other factors. 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). The fact that students are not encouraged by their lecturers and the highest number of lecturers who claim that they are not encouraged by either students or colleagues imply that self-efficacy is a defining factor. The aspect of perceived usefulness cannot be overemphasized because substantial benefits of Web 2.0 were already reported in sections 4.3.4.1, 4.3.4.2 and 4.3.4.3. These responses align with those of Ajjan and Hartshorne (2008:138) who report that lecturers use these technologies because "they are fairly

comfortable with using Web 2.0, can explain the value of Web 2.0 to colleagues, and believe that Web 2.0 is useful and beneficial in their teaching".

4.3.5.2. Reasons for lecturers' non-use of Web 2.0 technologies in teaching

Table 7 reveals that there is only one main reason for non-use of Web 2.0 technologies by lecturers, viz. they can teach just as well without them. Since lecturers consistently claim in section 4.3.4 that these technologies are useful in teaching, it was reasonable to seek clarification during the interviews which are reported on in Chapter Five. Worth noting is that in section 3.2.4, 15 (88.3%) lecturers accessed Web 2.0 technologies in their offices where each of them has computers and it is therefore surprising that Table 7 shows that 3 (17.6%) lecturers indicate they do not use Web 2.0 because they lack access to computers. Such claims may apply to those lecturers who either own laptops and computers but have no access to Internet at home or those who do not own computers and laptops altogether at home and are consequently deprived of access to these technologies when they are at home especially during weekends and on holidays. Nyirongo (2009:110) also reports that although many lecturers at MZUNI own personal laptops, access to the Internet is sometimes limited to the university campus.

A cross-tabulation of analyses reveals that all three 3 (17.6%) lecturers (LQRs 6; 9 & 11) who attributed the non-use of these technologies to lack of skills and faddishness are from the LIS department. This particular finding confirms suggestions made by the researcher in section 3.2 of Chapter Three that although all lecturers in the Faculty have basic ICT skills, lecturers in the ICT department have superior ICT knowledge and skills than lecturers in the LIS department because the former are ICT specialists.

Table 7. Reasons for lecturers' non-use of Web 2.0 technologies (N=17)

Reasons for use for non-use	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	f	$\%$	f	$\%$	f	$\%$	f	$\%$	f	$\%$
I can teach just as well without them.	1	5.9	14	82.4	1	5.9	0	0	1	5.9
I do not use Web 2.0 because of lack of technical support.	2	11.8	3	17.6	0	0	0	0	12	70.6
I think using Web 2.0 technologies put my privacy at risk.	1	5.9	3	17.6	2	11.8	4	23.5	7	41.2
I do not have access to computers.	3	17.6	0	0	0	0	0	0	14	82.4
I am very busy and it takes me too much time to use these technologies.	2	11.8	1	5.9	2	11.8	3	17.6	9	52.9
I do not have necessary skills to use such technologies.	1	5.9	2	11.8	2	11.8	0	0	12	70.6
I think they are a fad and more for entertainment.	1	5.9	2	11.8	3	17.6	4	23.5	7	41.2

4.4. Conclusion

In this chapter, the researcher has presented, summarised and interpreted data that were collected about the use of Web 2.0 in teaching and learning at the Faculty of ISC at MZUNI. The data analysed were collected from students and lecturers who answered the questionnaire. In particular, the data analysed were in relation to personal information, awareness of and familiarity with Web 2.0 technologies, purposes for using Web 2.0 technologies and influencing factors for use or non-use of Web 2.0 technologies.

The next chapter (Chapter Five) will present summarise and interpret data which were collected by analysing the curricula and by conducting follow-up interviews with some lecturers.

CHAPTER FIVE

PRESENTATION AND INTERPRETATION OF DATA: CURRICULA ANALYSIS AND FOLLOW – UP INTERVIEWS

5.1. Introduction

The aim of the study was to investigate the use of Web 2.0 technologies in learning and teaching by students and lecturers in the Faculty of ISC at MZUNI in Malawi. The chapter has two parts. Firstly, the researcher analyses data that were gathered from the curricula and secondly, he analyses data gathered through interviewing some lecturers. The curricula and the interview data are analysed in the same chapter because unlike the questionnaire data, the curricula and the interview are purely qualitative data. The researcher analysed the curricula first so that some issues noted in the curricula could be clarified by lecturers during the interview process.

5.2. Presentation of data from the curricula

As indicated in Chapter Three, the researcher analysed the curricula of LIS and ICT departments to establish if Web 2.0 technologies are embedded in these curricula and to determine how these technologies are being utilised to accomplish academic activities. A total of 43 LIS and 44 ICT courses were analysed by scanning documents such as course outlines, some prescribed or recommended texts, some lecture notes and some past assignments. Of the 43 LIS courses that were analysed, seven (16.3%) courses have at least some elements of Web 2.0. Likewise, of the 44 ICT courses that were analysed, eight (18.2%) contain some elements of Web 2.0. Appendix E provides a summary of both LIS and ICT courses that contain Web 2.0 technologies. As can be seen in Appendix E, the most common Web 2.0 technologies include YouTube, Twitter, Wikis and Google Apps or Google+. Appendix E reveals further that Web 2.0 technologies are integrated into the curricula as topics of study, as communication and collaborative learning tools and as learning and teaching resources.

5.2.1. Topics of study

 Essentially, topics of study imply that students are taught how to open accounts with, use and customise these technologies to fit their learning needs and experiences. As can be seen in

Appendix E, the Web 2.0 technologies that students are taught in class include Twitter, Blogs, YouTube, Google Apps, Wikis, Sound Cloud and RSS Feeds. The fact that Wikipedia, Google Apps and YouTube are taught in class explains why responses in section 4.2.2.2 showed that the majority of students are fairly proficient at using these Web 2.0 technologies. Ironically, results in 4.2.2.2 show further that only a limited number of students are proficient in using technologies such as RSS Feeds and Blogs which are also taught in class. The reason could be that lecturers either skip these technologies or students neglect them after they are learnt.

Reasons for not having a stand-alone module entitled Web 2.0 might vary, but one of them could be that the Faculty has not recently reviewed its curricula since its last revision in 2009 when research in relation to the value of Web 2.0 in education was in embryonic stages. Thus, despite Web 2.0 elements not explicitly appearing in most courses, it may happen that lecturers teach and encourage their students to use these technologies. Findings of the present study replicate what has been reported in some European LIS schools. By reviewing the LIS Web portals of four USA, four UK and three Greek LIS schools, Garoufallou and Charitopoulou (2012) state that the curricula of these LIS schools are rather implicit about the implementation of Web 2.0 technologies and social media applications in their modules. However, the researchers (Garoufallou and Charitopoulou, 2012) defend these LIS schools by stating that a first look at departmental curricula does not warrant criticism of the departments as it is possible to teach or implement Web 2.0 applications without mentioning this information in short curricula descriptions presented in their Web portals.

5.2.2. Communication and collaborative learning tools

In this context, communication and collaborative learning are basically two sides of the same coin. Communication refers to virtual interaction between students and lecturers and amongst students themselves using some Web 2.0 technologies as supplements to face-to-face interaction. Appendix E shows that technologies mainly used for this purpose include Twitter, Google+ and WhatApp. These technologies are mainly used by lecturers to communicate content with students and reciprocally, students use them to submit assignments. The finding corroborates well with responses reported in sections 4.2.3.2 and 4.3.3.2 where both students and lecturers indicate that they use these Web 2.0 technologies to communicate with each other.

It is revealed in Appendix E that in addition to facilitating communication, Google Apps are predominantly used to accomplish collaborative learning activities. Perceived usefulness, one of the constructs of the DTPB model can be seen as a key, determining factor for the use of Google Documents. Taylor and Todd (1995) define perceived usefulness as the degree to which individuals believe that a technology can improve their job performance. Google Documents are Web-based implying that lecturers and students can access them 24/7 via any basic Internet enabled device. This frees them from being restricted to a particular work station, allowing them to create, safely store and share a file in its original format thereby making their teaching more appealing and convenient than ever before. It is for this reason that students use Google Docs which mimic the functionality of Microsoft suites to work on assignments and share with lecturers.

5.2.3. Learning and teaching resources

As can be seen in Appendix E, Web 2.0 technologies include YouTube, Wikis and Blogs. These results substantiate findings reported in sections 4.3.4.1 where it was noted that lecturers use some Web 2.0 technologies, particularly YouTube videos as learning aids. Although Appendix E shows that Wikis were also primarily used for this purpose, some researchers have warned against their use. Luckin *et al.,* (2009:95) argue that sometimes Wikis and Blogs contain information or facts which contradict facts contained in credible Websites. The reason could be attributed to the fact that information posted on Wikis is not always written or edited by subject experts.

5.3. Presentation of data from follow-up interviews with lecturers

As highlighted in Chapter Three, the researcher conducted follow-up interviews with some LIS and ICT lecturers. Of the 17 lecturers who answered the questionnaire, seven were interviewed of whom, four were from the LIS department while three were from the ICT department. The only female participant was from the LIS department. Interviews were recorded using the Parrot Voice Recorder, an application found on BlackBerry 10 smart phone. McNamara (1999) claims that interviews are usually very useful as follow-up to questionnaires to further investigate responses. Based on this premise, the questions were formulated in light of the inconsistencies and gaps that were identified after analysing the data collected from students and

lecturers using a Web-based questionnaire (see Chapter Four) and through analysing the Faculties' curricula (see section 5.2). The questions asked gathered data about the concept of Web 2.0, types of Web 2.0 technologies used in teaching, collaborative learning activities, reasons for teaching without Web 2.0 technologies, Web 2.0 research activities, Web 2.0 and the curricula, reasons for underutilisation of some Web 2.0 technologies and how electricity blackouts affected access to Web 2.0 technologies For details on the questions that were asked, refer to the Interview Protocol (Appendix C).

5.3.1. The concept of Web 2.0

It was revealed in section 4.3.2 of Chapter Four that most lecturers are aware of most Web 2.0 technologies and are able to proficiently use some of them. This question was asked to find out from lecturers about their understanding of the 'umbrella' term used to collectively refer to those Web 2.0 technologies. The following are the extracts from the participants:

> *"In my understanding, Web 2.0 basically means the faster Internet which allows instant communication and examples are Facebook and YouTube"* (Lecturer 1, ICT department).
> *"These are the things like Facebook that allow interaction between people via Internet"* (Lecturer 2, LIS department).
> *"It's the way of developing Web pages that deliver dynamic content to the user using AJAX. It allows users to communicate and share information regardless of where they are* (Lecturer 3, ICT department).
> *"It means rich Internet applications like dynamic Web pages. More of front and user experience as Internet applications"* (Lecturer 4, ICT department).
> *"I think it refers to the use of Web technologies that allow instant communication amongst users. Users are involved in a real time conversation, creation of information, knowledge and they share right away or instantly. Those popular in Malawi include Facebook, Twitter, WhatsApp, etc."* (Lecturer 5, LIS department).
> *"To me, this means social media applications which are used mainly for instant and dynamic (videos, pictures, audio and texts) communication, e.g. Facebook. We call them Library 2.0 in the LIS field* (Lecturer 6, LIS department*).*

"I think it is the second generation of the Internet use where the user interacts more with the Internet. In it, there are a lot of interactive applications like Facebook, Google+, Blogs, etc." (Lecturer 6, LIS department).

It is clear that Lecturers 2 and 3 are more accurate in their definitions and explanation of Web 2.0 by using words such as 'AJAX' and "dynamic Web pages" thereby demonstrating their superior knowledge as ICT experts. By referring to Web 2.0 as Library 2.0, Lecturer 6 signals that an LIS lecturer is equally knowledgeable of these technologies. Regardless of the variations in the terms used to define these technologies, it is evident from the responses provided above that all lecturers are of the view that Web 2.0 is about "instant communication" amongst users regardless of their geographical locations. These definitions relate well with the way Kwanya, Stilwell and Underwood (2012) characterise Web 2.0 that "[It is] a definite Web feature that makes the Internet more sociable and real" and examples include "MySpace, Blogs and Facebook".

5.3.2. Web 2.0 primarily used for academic work

Reference is being made to section 4.3.3.2 of Chapter Four where lecturers mentioned several academic activities that they accomplish using Web 2.0 technologies but fell short of citing the actual types of Web 2.0 they use to accomplish each activity that they mentioned. This question was asked to seek details from lecturers about the specific Web 2.0 technologies that they use and the following quotations represent their responses:

"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).

"To be honest with you, I have never used these technologies in teaching, let alone for personal use but I am a member of a Facebook group for former LIS students where once in a while, we share and discuss some LIS issues. I do not use them because I don't think the Internet is reliable at MZUNI but I am planning to use them" (Lecturer 2, LIS department).

"I usually use Wikipedia, Google Documents and YouTube videos as part of the e-learn system" (Lecturer 3, ICT department).

"Diverse. I use social networks such as Twitter and YouTube for e-learning. E-learning, I mean administering assignments using Google Apps and Tweeting some school related work to my students" (Lecturer 4, ICT department).

"It actually depends on the type of the courses that I am teaching. For example, when teaching Classification, I usually encourage my students to visit some Facebook, Twitter and Wiki pages that provide additional resources. When administering exercises, I usually use Google Documents. You cannot rule out the use of Wikipedia also. I use Google Drive and sometimes Dropbox to store my lecture notes and other academic work" (Lecturer 5, LIS department).

"I mainly use Twitter for sharing articles related to the courses I teach and l also encourage my students to share articles related to the course" (Lecturer 6, LIS department).

"I use Twitter just to communicate with students and lecturers. I also share YouTube videos with students for them to learn some concepts" (Lecturer 7, LIS department).

Responses show that most lecturers are predominantly using Google Documents, YouTube and Wikipedia. The responses reflect the findings reported in section 4.3.3.3 of Chapter Four where it was found that more than 58.8% lecturers use Wikipedia, YouTube, Google Apps and Twitter in their academic work. The technologies mentioned are also explicitly embedded in the curricula as noted in section 5.2 and this could be the reasons that over 65.5% students indicated they are able to use these same technologies as revealed in section 4.2.2.2 of Chapter Four.

The response provided by Lecturer 4 that "…when teaching Classification, I usually encourage my students to visit some Facebook, Twitter and Wiki pages that provide additional resources" is in line with the actual contents of the curricula where in the Organization of Knowledge: Classification (LIS2406) course, students are advised to "follow the Library of Congress on Facebook and Twitter for some up-dates on cataloguing and classification". The statement by Lecturer 2 from the LIS department that "...I have never used these technologies in teaching…" confirms the findings reported in section 4.3.6 of Chapter Four where it was noted that some lecturers from the LIS department do not use these technologies because they lack the necessary skills.

5.3.3. Web 2.0 technologies used for communication

Since there are a wide range of Web 2.0 technologies that lecturers can use to communicate with students and colleagues, it was necessary to ask a question that could gather data about the technologies that lecturers commonly use to communicate amongst themselves and with students. The following are the responses from lecturers:

> *"Again, as I have already said, I mostly use Google Apps because of the advantages that I have already mentioned. I use the same applications to communicate with my colleagues as well. I usually use WhatsApp and BBM also. For example, if I am not coming to work, I usually 'whatsapp' students telling them about the cancellation of a lecture"* (Lecturer 1, ICT department).

> *"I have never used any of the Web 2.0 technologies to communicate with students. The reason is that I did not have a smart phone but I have own one now which has applications such as WhatsApp, Facebook and Twitter, I am planning to use them"* (Lecturer 2, LIS department).

> *"Mostly, I use Google Documents, BBM and Twitter"* (Lecturer 3, ICT department).

> *"I use the same Web 2.0 technologies that I have told you already: social networks such as Twitter and WhatsApp"* (Lecturer 4, ICT department).

> *"I mostly use BBM and WhatsApp because these are readily available on my BlackBerry phone. I don't use Facebook because I think it is too social"* (Lecturer 5, LIS department).

> *"Although I have been using BBM for a long time, I now encourage students to use Twitter to share information or articles related to my course"* (Lecturer 6, LIS department).

> *"Mainly BBM, but I am under pressure to start using Twitter and WhatsApp because most of my friends [lecturers] are using these technologies"* (Lecturer 7, LIS department).

It seems most lecturers were not sure if BBM is one of the Web 2.0 technologies because they only mentioned it when the researcher asked them if they were using it. This could be because the researcher did not include BBM in the questionnaire. Since most lecturers have pointed out explicitly that they use BBM to communicate with students, this could be the reason it was found

in section 4.2.3.3 of Chapter Four that only 23 (16.9%) students said they have ever used Twitter in their academic activities. The high number of lecturers who claimed to use Twitter may imply that they mostly use it to communicate amongst themselves or for other education purposes because responses in section 4.2.3.3 showed that only 8.8% students use Twitter for academic activities. The responses contradict results reported in section 4.3.3.3 of Chapter Four where only four (23.6%) lecturers indicated they had ever used WhatApp for academic work. This inconsistency could be because lecturers may not have fully understood what academic activities encompass. For example, some lecturers thought that by communicating with students using WhatsApp that the class had been cancelled is not an academic activity.

Observations made by Lecturer 5 about Facebook that "I don't use Facebook because I think it is too social" complement assertions made in section 4.2.3.3 of Chapter Four where it was suggested that students may not have used Facebook in academic work because social networks such as Facebook are primarily regarded to be informal and are generally perceived as virtual platforms for socialising, not learning.

5.3.4. Collaborative learning activities accomplished using Web 2.0 technologies

In Chapter Four, results showed that both students and lecturers use Web 2.0 technologies to, among others, work collaboratively to accomplish some academic work. Lecturers were therefore asked to explain the actual academic activities that they have put in place to drive students' engagement into collaborative learning using these technologies. Their responses are as follows:

> *"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).

> *"Like I already pointed out, I have never used these technologies for academic purposes just because I do not trust the reliability of the Internet at MZUNI"* (Lecturer 2, LIS department).

"Through online discussions and online mailing lists, I usually create a class mailing list which students use to debate or consult each other on some concepts" (Lecturer 4, ICT department).

"In the meantime, I would say I use Google Apps where students use Google Documents to collaboratively write group assignments" (Lecturer 5, LIS department).

"I encourage students to use Twitter to share information or articles related to my course. In the near future, I am also planning to incorporate tools like Blogs and Wikis in the course because I have realised they might provide a more interesting approach towards collaborative learning" (Lecturer 6, LIS department).

The dominance of Google Apps in conducting collaborating education activities underlines the power of this application and explains why students and lecturers have embraced these technologies. Similarly, Azab, Abdelsalam and Gamal (2013) report that students and lecturers in Egyptian public universities use Google Apps and other technologies to collaborate in research activities and to share academic content. Although Facebook can be aptly used for the purpose of collaborative learning (Zanamwe, Rupere & Kufandirimbwa, 2013), results of the present study show that apart from not being mentioned in the curricula, none of the lecturers use this technology. This confirms responses realised in sections 4.2.3.3 and 4.3.3.3 where it was noted that students and lecturers underutilise Facebook in their academic work. These findings together with those reported by Gaffar, Singh and Thomas (2011) and Madge *et al.,* (2009) reiterate a common perception that Facebook is too informal for educational use but rather, a tool for casual communicating and connecting with people.

5.3.5. Reasons for teaching without Web 2.0 technologies

This question was asked because results in section 4.3.6 of Chapter Four showed that most lecturers indicated they could teach LIS and ICT courses as well without Web 2.0 technologies despite their insistence in most occasions that there are opportunities and advantages associated with these technologies. The question was meant to explore the meaning behind such claims and responses from the lecturers are as follows:

"Did some really say like that? Possibly, I would think that it 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).

"I think it is possible although it is unfortunate for the situation to be like this in the 21st century. As for me, I have never used those technologies because as I have already said, the Internet is somehow poor. But I strongly attribute the status quo to the fact that most lecturers including myself are not aware of the benefits and opportunities that come along with these technologies" (Lecturer 2, LIS department).

"Although I am not one of those lecturers who said that, I suggest that my colleagues said so meaning that they could teach these technologies even if the Internet is down especially taking into account that Internet is sometimes unreliable at MZUNI (Lecturer 3, ICT department).

"While in office, I hear some colleagues complaining about the Internet but I know these technologies do not need a lot of bandwidth. For example, I answered your Web-based questionnaire [shared on Google Drive] using the same Internet and I experienced no problem. Now, we are talking via Skype and we are experiencing very minimal interruptions. So, I think they do not use these technologies because they lack time and interest to use them" (Lecturer 4, ICT department).

"In my opinion, it is very surprising indeed that a lecturer can teach without Web 2.0 technologies because these technologies come along with a lot of opportunities. I think it is because they are not aware of the benefits that are associated with the use of these technologies" (Lecturer 5, LIS department).

"I never said that but probably this was said because lecturers have been teaching perfectly long before these technologies came into existence which means they can still teach when the network [Internet] is disappointing. I don't think that they meant that the technologies are useless, but they meant that even in their absence they can still teach (Lecturer 6, LIS department).

"Maybe because some lecturers are not using Web 2.0 technologies or they have not used them before in teaching, otherwise, I am shocked some lecturers' said that" (Lecturer 7, LIS department).

Based on the responses, it is evident that most lecturers' responses belie the results reported in section 4.3.6 of Chapter Four where 15 (84.3%) lecturers claimed they could teach without these

technologies. Interestingly, a deeper analysis of the data shows that of the seven lecturers who were interviewed, four of them are among those who said they could teach without these technologies. But during the interview, only Lecturer 2 reiterated teaching without these technologies. Points raised by Lecturers 3 and 4 provide an important interpretation to what lecturers meant: if they are unable to access and use Web 2.0 technologies such as Google Apps due to unforeseeable circumstances viz. Internet interruptions or electricity outages, they can still teach normally.

5.3.6. Students' claims about the use of Web 2.0 technologies

It was revealed in section 4.2.4.1 of Chapter Four that of the 136 students who answered the questionnaire, only 48 (35.3%) indicated they were encouraged by their lecturers to use Web 2.0 technologies in their academic activities while the rest, said they were not. This question was asked to accord lecturers an opportunity to respond to the students' claims and the following statements represent their responses:

> *"I have taught both LIS and ICT students and I have not just encouraged them but rather forced them to use these technologies. For example, I usually tell them I will not mark the assignment if they do not upload and share it with me on Google Drive. I strongly disagree with those claims made by students. The problem with students is that even if you encourage them to use these technologies, they usually don't use them anymore when they are done with that course"* (Lecturer 1, ICT department).

> *"I wouldn't be surprised to hear that only a small number of students were encouraged by lecturers because as I said earlier on, I have never used these technologies which means I am one of the lecturers who do not encourage students to use them. But I am planning to use them in the following school calendar"* (Lecturer 2, LIS department).

> *"As an ICT lecturer, I usually encourage all students that I teach to use technologies such as Wikipedia, YouTube, Google Apps, etc."* (Lecturer 3, ICT department).

> *"Very true! Some lecturers don't have time to use these technologies and do not therefore encourage their students too. In my case however, I do encourage my students to use these technologies. How can one teach without using YouTube or Google Apps in this 21st century?"* (Lecturer 4, ICT department).

"Well, students could be very right because not all lecturers in the Faculty have embraced these useful technologies. A colleague once told me that he cannot open an account with Facebook because he just doesn't want" (Lecturer 5, LIS department).

"That is not a surprise to me, because not every lecturer uses these technologies in teaching. To me, these claims mean that there are a few lecturers using these applications hence these results" (Lecturer 6, LIS department).

Our students usually do several ICT courses in which Web 2.0 technologies are addressed. So by saying they are not encouraged, they mean those lecturers who do not use these technologies in teaching. I don't agree with what students said" (Lecturer 7, LIS department).

Responses show that only Lecturer 2 supports the claims made by students for the obvious reason: the lecturer has never used these technologies in teaching. However, other lecturers insist that they encourage students to use these technologies. There could be two possible reasons why students made such claims. Firstly, the following statement offers a clue: "the problem with students is that even if you encourage them to use these technologies, they usually don't use them anymore when they are done with that course" (Lecturer 1, ICT department). This could be true because it relates well to the researcher's own experience at UWC where after being fairly 'forced' to use Blogs, Twitter and Wikis by a lecturer for the whole semester, most of the students' Twitter accounts became inactive just after the final lesson. Secondly, being already technology driven, students may have thought that by being asked to submit assignment via Google Apps does not necessarily mean they are being encouraged or forced but rather, it is a normal way the course is supposed to be conducted.

5.3.7. Research, published papers and conferences in relation to Web 2.0 technologies

As reported in Chapter Four, there is compelling evidence that lecturers are aware of most Web 2.0 technologies. Being lecturers and mostly specialised either in ICT or LIS, the researcher found it necessary to ask lecturers if they had any information regarding the prevailing research activities in relation to Web 2.0 technologies at MZUNI. Also, since some Web 2.0 technologies such as YouTube, Twitter, Wikipedia and WhatsApp are explicitly mentioned in the curricula (see section 5.2), one would expect lecturers to conduct some studies in relation to such

technologies. More importantly, it is understood that Web 2.0 is a relatively new concept and as a consequence, there have been several conferences taking place globally. It was therefore necessary to ask lecturers whether they had attended any of those local or international conferences. The following responses represent the lecturers' views in regards to the research, published papers and conferences about Web 2.0:

> *"Not really. This study that you are conducting is the only one I am hearing. Maybe in other departments or faculties but I doubt if there is any lecturer or member of staff researching these technologies. I have not written any paper and since it is not my area of specialisation or interest. I have not attended any conference and I am not planning to attend any soon"* (Lecturer 1, ICT department).

> *"Basically, I have never heard anyone researching Web 2.0 at MZUNI. I don't even know if MZUNI as an institution has some policies in relation to Web 2.0 research. I have not conducted any study or written anything IN relation to this topic. "I have never attended any of such a conference but I would be very much willing to attend one if offered an opportunity"* (Lecturer 2, LIS department).

> *"Maybe in other departments, but honestly I have no idea about any study being conducted or ever conducted by a MZUNI staff about Web 2.0. Honestly, I have not written any paper but I think once I obtain my master's degree in few years, I will be able to do a study related to this topic of interest. I have never attended a conference or workshop about Web 2.0. But I may be willing to attend one especially if it is about teaching and learning because I am a lecturer"* (Lecturer 3, ICT department).

> *"I have not heard anything and I do not know if MZUNI as an institution has put in any strategies to ensure these technologies are researched and harnessed in education. There are no plans to research on them because I am now busy studying for my PhD"* (Lecturer 4, ICT department).

> *"I have not written or published any paper as it [Web 2.0] is not the area of my research interest. I have not attended any conferences but if given an opportunity, I can attend for the benefit of the department and for the benefit of my students"* (Lecturer 5, LIS department).

> *"Not yet published a paper but I am planning to do so in future"* (Lecturer 6, LIS department.

It is clear that apart from the present study, all lecturers have not heard of any study in relation to Web 2.0 technologies in the Faculty and at MZUNI as a whole. The results also show that despite using these technologies in teaching, none of the lectures have conducted any study about these technologies. Most lecturers indicate that they are not planning to research Web 2.0 because it is not within their research interest. Interestingly, all lecturers have never attended any conference on Web 2.0. However, most lecturers have expressed absolute interest in attending these conferences if offered such an opportunity. The results strongly support comments made by the researcher in the research problem section (see section 1.4.) that although it is clear that MZUNI has taken some initiatives to improve Internet access, there seems to be no literature to date to determine the extent to which Web 2.0 technologies have been adopted by students and lecturers in teaching and learning at this university. In other words, the findings support the researcher's decision to carry out the present study.

5.3.8. Addressing Web 2.0 technologies in the courses

Despite concerted efforts made to probe more from lecturers, all of them did not answer this question and they advised the researcher to refer back to the responses they had provided in the previous questions. They claimed the question was a repetition of the other questions already answered. In line with UWC ethics, Cater (2014), and Davies (2006) participants should take part in the study voluntarily and are not forced to answer every question therefore, the researcher did not force them to provide the answers.

5.3.9. Strategies for integrating Web 2.0 technologies in the courses

The question was asked on the basis that only seven (16.2%) of the 43 LIS and eight (18.8%) of the 44 ICT courses that were analysed mentioned Web 2.0 explicitly. The question sought to solicit data about plans or measures the lecturers had put in place to integrate Web 2.0 into their courses. The responses provided are considerably similar to those already provided in the previous questions as follows:

> *"Indeed I know that some courses address issues of Web 2.0 but the majority do not. In my case, I am planning to integrate them in my courses by asking my students to follow me on Twitter. I will create a Blog and make use of WhatsApp to communicate with*

students and colleagues in the Faculty. The advantage is that as a lecturer, I am allowed to add or remove 10 or 20 per cent of the course contents" (Lecturer 2, LIS department).

"In the case of ICT, there are already courses in which Web 2.0 technologies are taught. Examples are Web Programming and Web Design. Also, as a lecturer, I have a liberty to include other topics which I believe are useful" (Lecturer 3, ICT department).

"There is a need to integrate Web 2.0 in the course outlines probably through conducting a curriculum review. But I am using these technologies even though my courses outline does not show" (Lecturer 3, ICT department).

"I know that our students [LIS] do several compulsory ICT courses. Such courses usually introduce them to Web 2.0 technologies" (Lecturer 5, LIS department).

"Like l said before, I am planning to include Blogs and Wikis because I have noted that they can offer more interesting collaborative aspects" (Lecturer 6, LIS department).

"As I said, I currently use Google Apps even though my course outline may not have shown so" (Lecturer 7, LIS department).

Upon cross-checking the courses that the lecturers have mentioned they teach against the curricula, the researcher has noted that only three courses, namely Organization of Knowledge: Classification (LIS2406), Computer and Communication Technology (ICT1103) and End User Computing (ICT1101) have some elements of Web 2.0. The first course is exclusive to LIS students whereas the latter two are compulsory for both, LIS and ICT students. However, it is clear from the responses provided above that lecturers have integrated some of these technologies in their courses. Statements made by Lecturers 2 and 3 that "…I am allowed to add or remove 10 or 20 per cent of the course contents" and "…I have at liberty to include other topics which I believe are useful" respectively, tell it all why Web 2.0 technologies are conspicuously missing in the curriculum whilst lecturers claim they are using them in their academic activities.

5.3.10. Reasons for underutilisation of some Web 2.0 technologies

It was revealed in Chapter Four that the Web 2.0 technologies such as Wikipedia, YouTube, Blogs, Google Apps, Twitter and WhatsApp are regularly used by both students and lecturers in their academic endeavours. However, technologies including Dropbox, Facebook, Delicious,

RSS Feed, Flickr, Skype, LinkedIn, Viber and Picasa are in reality underutilised. The question was asked to seek views from lecturers why these technologies are underutilised in academic activities. The following responses were gathered from lecturers:

"I think it is because there are too many Web 2.0 technologies available. Students and lecturers will usually use those that are very popular than those not very popular. For example, if my phone has applications such as Facebook, Twitter and WhatsApp, chances are higher that I can easily use these technologies than those that I have to access them only in HTML format or computer" (Lecturer 1, ICT department).

"Since your preliminary results from the questionnaire indicated that most students were not encouraged by their lecturers, I would attribute such an underutilisation to such a finding because I have already accepted above that I am one the lecturers who do not encourage my students to use them. On the part of lecturers, I think they just lack interest just like me" (Lecturer 2, LIS department).

"Some Web 2.0 technologies such as RSS Feeds are mostly used for news and most students and lecturers do not read news on the Internet. The other tools are not common in Malawi" (Lecturer 3, ICT department).

"Very much so! It is because some students and lecturers are not aware of their importance. You need to organise a workshop for both lecturers and students on the same when you finish your studies" (Lecturer 4, ICT department).

"To be honest with you, some of the technologies are not popular in Malawi. Maybe we need a full course on Web 2.0 but this can be done during the curricula review" (Lecturer 5, LIS department).

"I think all goes back to the issue of being knowledgeable and skilled in using a particular application. Being skilled in using Facebook doesn't mean you can use RSS Feeds" (Lecturer 6, LIS department).

"Even myself 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).

According to the responses, most lecturers have attributed the underutilisation of the said technologies to unpopularity. This means that students and lecturers may have only used those technologies that are popular in Malawi. The points raised by Lecturer 1 need not to be ignored.

The lecturer expressed views that other technologies might not have been used "because there are too many Web 2.0 technologies available" and those sentiments rightly correspond with an observation made in Chapter Two that there are many Web 2.0 technologies and they usually have overlapping functionalities which make choosing technologies difficult.

5.3.11. Effects of electricity outages or blackout on Web 2.0 adoption

It was established in section 4.2.4.2 of Chapter Four that only 43 (31.6%) students indicated they were discouraged to use Web 2.0 technologies by electricity outages. Such claims were in sharp contrast to researchers such as Nyirongo (2009) who report that electricity is a major problem at MZUNI. The question was thus asked to gather lecturers' opinions and their responses are as follows:

> *"I don't actually agree with them. There is a great link between Internet and electrify. If there is no electricity, you can't access the Internet"* (Lecturer 1, ICT department).

> *"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).

> *"Electricity at MZUNI is somehow reliable but the main problem is lack of enough resources (computers) and Internet for students to access Web 2.0 technologies"* (Lecturer 3, ICT department).

> *"Electricity at MZUNI is relatively stable because we have a generator. But it still remains an impediment. The advantage is that we still access Web 2.0 technologies via our smart phones when there is no electricity"* (Lecturer 4, ICT department).

> *"I would say the situation has fairly improved but we still experience some blackouts but they are not all that irritating. But as an institution of higher learning, we need zero electricity outages"* (Lecturer 5, LIS department).

> *"My opinion is that electricity is a problem at MZUNI. Although the university has a generator, it is not reliable either"* (Lecturer 6, LIS department).

> *"Electricity is one of the impeding factors to the successful use of Web 2.0 technologies as it is not reliable. There are so many blackouts within a day"* (Lecturer 7, LIS department).

Responses suggest that lecturers have slightly divided opinions about the situation of electricity at MZUNI and how it affects access to Web 2.0 technologies. Lecturers 3, 4 and 5 are of the view that electricity was "somehow", "relatively" or "fairly" reliable at MZUNI but do reiterate the need for "zero electricity outages" at the institution. Conversely, Lecturers 1, 2, 6 and 7 are of the view that electricity is a huge impediment to Web 2.0 access thereby disagreeing with students' claims outright. Lecturer 4 provides an important hint about what may have swayed students not to regard electricity outages as a problem. The lecturer says "the advantage is that we still access Web 2.0 technologies via our smart phones when there is no electricity". This observation echoes the suggestion made in section 4.2.4.2 that since it was revealed that most students use smart phones to access Web 2.0 technologies, they could still access Web 2.0 technologies all day without being affected by electricity hitches experienced on campus.

5.4. Conclusion

This chapter has presented data which were gathered through analysing the curricula of LIS and ICT departments and from the lecturers who were interviewed. On the part of the curricula, documents such as course outlines, lecture notes, assignments and recommended or prescribed texts were scanned to establish the presence and utilisation of Web 2.0 technologies. In regards to the interview data, the researcher has analysed the concept of Web 2.0, types of Web 2.0 technologies used in teaching, collaborative learning activities, reasons for teaching without Web 2.0 technologies, Web 2.0 research activities, Web 2.0 and the curricula, reasons for underutilisation of some Web 2.0 technologies and how electricity blackouts affect access to Web 2.0 technologies.

The next chapter (Chapter Six) will discuss the findings realised in this chapter and Chapter Four.

CHAPTER SIX

DISCUSSION OF FINDINGS

6.1. Introduction

Presenting, summarising and analysing the results (see Chapters Four and Five) do not provide answers to the research problem, let alone transform field data into information. It is best to conduct a deeper interpretation and discussion of the findings to establish if the key research questions have been answered or not. As already stated in Chapter Three, the researcher adopted a case study design by investigating the adoption and use of Web 2.0 technologies in teaching and learning by students and lecturers in the Faculty of ISC at MZUNI, Malawi. Thus, this chapter answers the research questions by triangulating the results from the questionnaire (predominantly quantitative), curricula analysis and follow-up interviews (entirely qualitative). To achieve this, the researcher makes concerted efforts to compare the results within themselves, with comments and observations made by other scholars and with results of most studies (see Chapter Two) conducted elsewhere in relation to Web 2.0 in teaching and learning. More importantly, the DTPB model which is the cornerstone of this study is time and again used to provide meaning to the findings. In some cases, especially where necessary, attempts have been made to relate the findings to the researchers' personal experiences.

6.2. Recap and summary of the specific research questions

The study attempted to answer the following four research questions that were identified in Chapter One:

- What is the current awareness of and familiarity with Web 2.0 technologies amongst students and lecturers in the Faculty of ISC?

  To establish if they were aware of and familiar with these technologies or not, the researcher asked lecturers and students, analysed the curricula and conducted follow-up interviews with lecturers about the Web 2.0 technologies they were aware of, their ability or competency in using the technologies, the technological devices that they used to connect to Web 2.0 technologies and the places where they accessed these Web 2.0 technologies.

- For what educational purpose do students and lecturers in the Faculty of ISC use Web 2.0 technologies and which Web 2.0 technologies do they use most?

  To identify the purposes and the technologies, students and lecturers were asked several aspects: first, the general activities they performed using Web 2.0 technologies, second, the specific educational activities they conducted using these technologies and finally, the common Web 2.0 technologies that they used most to accomplish academic activities. Apart from analysing the curricula, the researcher conducted follow-up interviews to identity the educational purposes and the Web 2.0 technologies which were used most.

- What do lecturers in the Faculty of ISC perceive as benefits of integrating Web 2.0 technologies in teaching and learning?

  To determine the perceived benefits, the researcher asked lecturers to indicate or mention: firstly, the benefits of using Web 2.0 technologies to perform educational activities in general, secondly, advantages of integrating Web 2.0 technologies in a classroom environment and lastly, the importance of exposing students to Web 2.0 technologies. The researcher conducted follow-up interviews with lecturers to reveal more benefits of Web 2.0 technologies in relation to teaching and learning.

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

  To ascertain the specific prevailing influencing factors, the researcher asked students and lecturers the enabling and hindering factors for use and non-use of Web 2.0 technologies respectively. Additional influencing factors for the adoption and non-adoption of Web 2.0 technologies were identified by conducting interviews with the lecturers.

6.2.1. What is the current awareness of and familiarity with Web 2.0 technologies amongst students and lecturers in the Faculty of ISC?

Some researchers (Azab, Abdelsalam & Gamal, 2013; Sandars & Shorter, 2007) have independently indicated that although the integration of Web 2.0 technologies such as Blogs, Twitter, Wikis and Facebook have become popular in higher education, the application of other Web 2.0 technologies such as Podcasts is still marginal and for it to hold its ground, Linh (2008) argues that researchers need to pay attention and research on awareness and familiarity. Motivated by those researchers (Sandars & Shorter, 2007; Linh, 2008; Azab, Abdelsalam &

Gamal, 2013), the present study investigated the aspects of awareness and familiarity amongst students and lecturers and it reports the value or significance of these two aspects in the adoption of Web 2.0 in teaching and learning. In the present study, results have shown that students and lecturers are aware of the existence of most Web 2.0 technologies. Specifically, between 80 (58.8%) and 135 (99.3%) students and between 11 (64.7%) and 17 (100%) lecturers are aware of Facebook, Wikipedia, WhatsApp, Google Apps, Twitter, YouTube and Skype. The proliferation of smart phones in Malawi have contributed significantly to students' and lecturers' awareness of the technologies mentioned because most phones, especially smart phones 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 are contained in the curricula. Unlike students, all 17 (100%) lecturers are aware of LinkedIn because they use it to remain visible to potential employers. It was only revealed during follow-up interviews that most lecturers are also aware of BBM.

In terms of familiarity (ability to use the technologies), between 80 (58.8%) and 129 (94.8%) students are proficient in using Facebook, Wikipedia, Google Apps, WhatsApp, YouTube, Skype and Twitter and between 9 (52.9%) and 15 (88.4) lecturers have skills for using Facebook, Skype, YouTube, Google Apps, Wikipedia, Twitter, WhatsApp, LinkedIn, Blog and Dropbox. Unlike the studies reviewed in Chapter Two, this study notes that Sound Cloud and Google+ are being used for academic purposes. An extract that follows from the module offered to ICT students suggest that Sound Cloud is mainly used by ICT students and 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+.*

Thus Sound Cloud, Google+ and YouTube are used because according to the DTPB, the technologies are seen as adding value (perceived usefulness) and fit (compatibility) with students' and lecturers' learning and teaching activities respectively. This is probably the reason Bawden (2008) argues that the full range of Web 2.0 features should be covered in the curricula

because it is difficult to predict which will be of importance for LIS practice or for carrying out learning and teaching activities.

The results show further that lecturers and students cannot use some technologies that they are aware of. For example, both lecturers and students possess limited or zero knowledge, abilities and skills for using Delicious, Flickr, Picasa, Viber, Dropbox and Podcasts mainly because most of these technologies are relatively new and unpopular in Malawi and also because they are conspicuously missing in the curricula. Despite other technologies such as RSS Feeds and Blogs being taught in class as revealed in the curricula as proven by this extract from a Web Design (ICT2402) module: "Students should be able to embed new media technologies such as Facebook, Twitter, YouTube, RSS Feeds and Sound Clouds to the Websites [they create]", only few students are able to use those technologies. Although it was suggested in section 5.2.1 that lecturers may have skipped teaching some of these technologies due to time factors, a more convincing reason was revealed during interviews with lecturers. Most lecturers supported a comment made by one of their colleagues that "the problem with students is that even if you encourage them to use these technologies, they usually don't use them anymore when they are done with that course" (Lecturer 1, ICT department). This implies that students tend to concentrate on using only those Web 2.0 technologies such as Google Drive, Twitter and WhatApp that they are interested in, especially if the technologies can as well be used for personal reasons. In other words, students do not see the value (perceived usefulness according to the DTPB) of some technologies such as Blogs and RSS Feeds that they learn in class.

The students' and lecturers' lack of knowledge and skills of the use of some Web 2.0 technologies is not unique to Malawi. In South Africa, Mugwanya, Marsden and Boateng (2011) investigated the lecturers' and students' experience in podcasting at the University of Cape Town (UCT) focusing on identifying the current experiences, familiarity and knowledge. They report that lecturers and students 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.

In comparison, more lecturers than students in the present study possess necessary skills and knowledge in using Web 2.0 technologies implying that these findings are in sharp contrast with

views made by Bawden (2008:23) who suggests that crucially, many students are very familiar with Web 2.0 technologies – more so than most academics in Australia, Ireland, Lithuania and in the United Kingdom. In Europe, it is said that access to technology including Internet technologies (Web 2.0 technologies) is part and parcel of people's everyday life whereas in Africa including Malawi, Web-based technology is still in embryotic stage, remains sparse and it is described by Gakio (2006) as too little, too expensive and poorly managed. Thus, in this study, lecturers' financial muscle contributed to their familiarity with these technologies.

Most students and lecturers are also conversant with the technological devices used to connect to Web 2.0 technologies. The technological devices that between 97 (71.3%) and 121 (89%) students and 14 (82.4%) lecturers use to access Web 2.0 technologies include laptops, smart phones and desktop computers. Very few students and lecturers use iPads or tablets to access these technologies because in Malawi, these devices are expensive for an economically disadvantaged student to afford. In terms of places for accessing Web 2.0 technologies, between 69 (54.3%) and 106 (83.5%) students access these technologies in the library, American Corner Internet Café, and Internet Café outside the university campus whereas between 10 (58.8%) and 15 (88.3%) lecturers access Web 2.0 technologies in offices and in the library. The highest number of lecturers accessing the technologies in offices substantiates findings by Nyirongo (2009) who claims that since 2006, Internet provision at MZUNI has been extended to the teaching area with the result that lecturers do not have to go to the library to access the Internet. The fact that students access these Web 2.0 technologies in the library gives substance to the anecdotal evidence that academic libraries have remained the main providers of Internet services. In the present study, it is not surprising that students and lecturers use the library and offices most respectively because in their DTPB, Taylor and Todd (1995) argue that individuals are expected to use the technology if computers and Internet facilities (technology facilitating condition) are made available. These findings are not unique to students in the Faculty of ISC at MZUNI as the results reflect the researcher's own experience at UWC in South Africa where he and fellow postgraduate students mostly access Web 2.0 technologies in the university library where computer and Internet services are offered for free.

The study has found that a shortage of classrooms at MZUNI adversely affects students' and lecturers' use of the faculty computer laboratory as an access point of Web 2.0 technologies

because slowly but surely, the faculty computer laboratory is serving other departments and faculties as a teaching venue. The situation is worsened by an almost absence of Wi-Fi thereby increasing congestion in the already small library Internet room where, according to Nyirongo (2009:72) and Chaputula (2012:372), the library staff sometimes ration students' access to this room because computers are insufficient. It appears that previously, Wi-Fi existed at MZUNI because Nyirongo (2009:62) reports that Wi-Fi Internet technology is installed at the university though the study does not explicitly mention whether the said Wi-Fi covered the whole university campus. Maybe it does refer to the limited Wi-Fi available in the library's Internet room as reported in this study and by Chaputula (2012).

These findings align with some studies conducted in India where Majhi and Maharana (2011) report that most of the university community at Utkal and Sambalpur Universities in India are very much aware about the existence of certain Web 2.0 technologies particularly, Facebook, Wikis and Twitter but they lack practical skills. Unlike Majhi and Maharana (2011) who push the blame of inability to use Web 2.0 technologies on lack of awareness alone, the present study finds that the continuous emergence of new Web 2.0 technologies coupled with their overlapping functionalities make it difficult for students and lecturers to know and make use of them all. In a nutshell, these findings suggest that by being aware of Web 2.0 technologies, does not necessarily mean that lecturers and students have ideal skills to use them and the findings explain why Sandars and Shorter (2007) and Linh (2008) put emphasis on the need for researchers to closely examine the aspects of awareness and familiarity when researching Web 2.0 in teaching and learning.

Kumar (2009), Majhi and Maharana (2011), Ping and Issa (2011) and Azab, Abdelsalam and Gamal (2013), and Mugwanya, Marsden and Boateng (2011) have all overwhelmingly recommended the need for awareness programmes or lessons on Web 2.0 but these researchers fall short of detailing how to achieve this. Uniquely, this study finds that the inclusion of Web 2.0 in the curricula pays off. Hence, it can be regarded as one of the effective and practical ways of inculcating knowledge and skills of Web 2.0 in students.

6.2.2. For what educational purpose do students and lecturers in the Faculty of ISC use Web 2.0 technologies and which Web 2.0 technologies do they mostly use?

Since the study has established that students and lecturers are aware of and have necessary skills to use some Web 2.0 technologies as was discussed in the preceding section, it is logical to conclude that they have adopted them. Thus, research question two assessed the personal and academic activities that students and lecturers performed using Web 2.0 technologies and also the Web 2.0 technologies that they used most to accomplish their academic work. Indeed, students and lecturers are using Web 2.0 technologies to accomplish various personal activities. Whilst both students and lecturers primarily use these technologies for carrying out school related work, socialising and entertainment, only lecturers largely use these technologies, particularly LinkedIn, to hunt for jobs. It is worth stating that all the 136 (100%) students and all the 17 (100%) lecturers use these technologies to accomplish various educational activities. So far, enough evidence has emerged that all students and lecturers are at least using some Web 2.0 technologies for school related work.

In as far as educational use of Web 2.0 technologies is concerned, findings show that the activities of students and lecturers are like two sides of the same coin. On one side of the coin, between 69 (50.7%) and 128 (94.1%) students use these Web 2.0 technologies to search for information, to communicate with lecturers, to submit assignments, to communicate with friends on academic work and to share content with fellow students. On the other side of the coin, most lecturers use these technologies in 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 emerging evidence that students and lecturers use Web 2.0 technologies to communicate with each other strengthens findings of some studies in Chapter Two. Li and Pitts (2009:175) and Eyyama, Menevis and Dogruer (2011:2660) independently 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 interview data all strongly reveal that lecturers use Web 2.0 technologies to send assignments, lecture notes and to provide feedback to students whereas students use these technologies to submit their completed assignments to their lecturers.

Results from the questionnaire, curricula analysis and interviews indicate that there are several types of Web 2.0 technologies which students and lecturers commonly use to accomplish various academic activities. Between 66 (45.8%) and 95 (69.9%) students use Wikipedia, WhatsApp, Google Apps and YouTube and similarly, between 10 (58.8%) and 13 (76.5%) lecturers use Wikipedia, YouTube, Blog, Google Apps, Twitter. Thus, findings from the questionnaire, curricula and interviews show that Wikipedia, Google Apps and YouTube dominate in both students and lecturers. Admittedly, most scholars, especially undergraduate students 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 students and 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. 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 for the adoption of any technology or innovation.

Although the study was unable to independently establish if students use BBM to accomplish academic activities, compelling evidence has emerged from the interviews with lecturers which categorically suggest that students too, use these Web 2.0 technologies. The following statement represents one of the many similar responses from lecturers which are a testimony that students use BBM for academic purposes:

> *"Although I have been using BBM for a long time [to communicate with students and colleagues], I now encourage students to use Twitter to share information or articles related to my course"* (Lecturer 6, LIS department).

These findings align with reports by Mtingwi and Van Belle (2012) that BlackBerry smart phones have become ubiquitous amongst many Malawians and the increase in use has been due to the fact that mobile network service providers in Malawi offer subsidised BlackBerry data bundle services.

Generally, the findings of the present study not only support and contrast results of other studies but also, over and above, underpin the perspectives of Taylor and Todd (1995), the architects of the DTPB model who argue that the degree to which a technology fits with the potential existing values and experiences increases its chances of being adopted. In the present study, it is not

surprising that students and lecturers use these Web 2.0 technologies as these technologies have proved their importance by being compatible with their normal ways of working in collaboration, storing lecture notes and managing their work schedules and not to mention student lecturer communication. In a bid to facilitate independent learning, lecturers encourage students to use YouTube videos to broaden their knowledge horizons. YouTube which is understood to have been adopted as the *de facto* video sharing for social networking and education is preferred to other similar technologies like Podcasts because of its integration of images, text and audio which presents the most comprehensive and a wealth of learning opportunities. It is again possible to notice how the aspect of perceived usefulness conceived by Taylor and Todd (1995) apply to this finding. The two authors define perceived usefulness as the degree to which an individual believes that a technology can improve his or her job performance. In this case, lecturers and students use YouTube in particular, because it adds value by helping students learn some concepts without the intervention of their lecturers.

Although the current study has found that these technologies are used to facilitate collaborative learning just as similarly reported by various researchers (Ajjan & Hartshorne, 2008; DeSchryver *et al.,* 2009), the main avenue for conducting collaborative learning is limited to Google Apps. Other technologies that are reported to be extensively used for collaborative learning or research activities such as Wikis and Blogs (Al-Qirim, 2010) are yet to be adopted for this purpose. Evidence has emerged that lecturers and students are yet to harness other opportunities that come along with these technologies viz. collaborating in research activities (Azab, Abdelsalam, Gamal, 2013; Luo, 2010), collaborative review of course contents using Wikis and Blogs (Al-Qirim, 2010; Luo, 2010) and accessing course materials collaboratively, posting reflections on work covered in class and viewing the work posted by students (Churchill, 2009). The prime reason for the non-use of these two important Web 2.0 technologies on the part of students is that the majority have indicated they are not able to use Blogs although they appear to be taught in class as revealed in the curricula. Further, despite being clear they use Wikis or Wikipedia, there is no evidence to indicate that students have hands on experience for creating a Wiki for example, let alone the knowledge for searching information in already constructed Wikis and Blogs. That is to say, in practice, students and lecturers use these Web 2.0 technologies resources in accordance with the role of "content consumer" more than a "content creator".

The study has revealed further that some Web 2.0 technologies such as Facebook and Skype which students and lecturers have indicated they are aware of and possess 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 findings of this study, 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 apparent reason for the low use of Facebook by both students and lecturers in the present study is that these technologies especially Facebook are regarded as too informal to be used for academic purposes. 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 (Zanamwe, Rupere & Kufandirimbwa, 2013) have proven to be an impetus for teaching and learning. Similar findings in regards to the use of Facebook have been reported by some researchers in Britain. Madge *et al.,* (2009) report that at the University of Warwick, University of Leeds, University of Brighton and University of Edinburgh in the United Kingdom, Facebook is used most importantly by undergraduate students for social reasons, not for formal learning purposes, although it is sometimes used informally for learning purposes. Without doubt, the findings of the present study together with those of Madge *et al.,* (2009) and Roblyer, *et al*., (2010) reinforce observations made by Selwyn (2007) and Kumar (2009) who cautions that the popularity of some Web 2.0 technologies particularly Facebook amongst students and lecturers does not directly translate into their use for educational purposes.

6.2. 3. What do lecturers in the Faculty of ISC perceive as benefits of integrating Web 2.0 technologies in teaching and learning?

Although Web 2.0 technologies are not short of controversies, paradoxes and complex issues in teaching and learning (Bawden, 2008:15), empirical studies reviewed in Chapter Two produced strong evidence about the benefits of these technologies. There is a consensus among various studies that these technologies facilitate communication and collaboration amongst students both in class and online (Ajjan & Hartshorne, 2008:74), help students develop more independent learning skills and confidence and become co-producers of class knowledge and content (Al-Qirim, 2010; Schroeder & Greenbowe, 2012) and enable students to seek help and support

outside of normal class room hours from lecturers (Brown, 2012:51). Other benefits extensively reported in the literature are that Web 2.0 technologies enable students and lecturers to easily follow current events and integrate them into their discussions and assignments (Greenhow, Robelia, Hughes, 2009; Tyagi, 2012) and that they give students a chance to express their opinions online without the impediments of limited class time and lack of confidence (Gaffar, Singh & Thomas, 2011:139; Farkas, 2012:85). Findings of the present study exposed similar benefits as will be discussed in the sections that follow.

Evidence emerged from section 6.2.2 that students and lecturers have adopted and integrated some Web 2.0 technologies in their educational activities implying that there are benefits associated with their use. The results from the questionnaire show that between 13 (76.4%) and 15 (88.4%) have a strong perception that Web 2.0 technologies facilitate collaborative learning, facilitate search for information, facilitate lecturer to lecturer and lecturer to student communication, make teaching easier aided by YouTube, facilitate storage of teaching resources such as lecture notes and eliminates distance as a barrier to collaborative learning. The questionnaire results are corroborated with 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 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 two decades ago that in the 21st century, 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 BBM are the main technologies that have been noted to visibly help lecturers save their time and some would-be costs. Time is a precious resource for lecturers who are always preoccupied with teaching, marking, conducting research, supervising

research projects of undergraduate students, attending conferences and attending departmental and faculty meetings. Thus, these technologies magnificently improve efficiency in communication and get rid of costs that could have been incurred in making phone calls which are "expensive" (Mtingwi & Van Belle, 2012) in Malawi. Unfortunately the DTPB does not clearly determine how free access to technologies affects their adoption. Maybe, another theory, the Diffusion of Innovations Theory (Rogers, 2003) which has been used by other researchers (Al-Qirim, 2010; Mugwanya, Marsden & Boateng, 2011) as observed in Chapter Two can best be used for this purpose. 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 a 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 website 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).

Results from the questionnaire have 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" (LQR 13). 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 to the DTPB, lecturers foresee usefulness of Web 2.0 in the future undertakings for 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 20 in teaching and learning helps prepares students for Library 2.0.

As observed in Chapter Two, researchers such as Greenhow, Robelia and Hughes (2009) and Tyagi (2012) have repeatedly highlighted that Web 2.0 technologies enable students and lecturers to easily follow current events which they integrate into their discussions and assignments. However, evidence emerging from the present study shows that students and lecturers are yet to start exploiting this opportunity which comes along with the use of Web 2.0. The paramount reason is that as already reported in section 6.2.1, most students and lecturers are not conversant with the use of RSS Feeds which according to Greenhow, Robelia and Hughes (2009) are usually incorporated into Blogs, Wikis and Websites to bring the current affairs in a particular topic of interest.

6.2.4. What are the factors that influence students and lecturers in the Faculty of ISC to adopt Web 2.0 technologies?

Using the DTPB model (see Chapter Two), some researchers (Ajjan & Hartshorne, 2008; Campion & Nailda, 2012; Gaffar, Singh & Thomas, 2011) investigated the factors that affect the adoption and use of Web 2.0 in teaching and learning in USA, Spain and Caribbean respectively. Findings of the present study mirror some of the findings reported by the researchers mentioned and will be discussed in the subsequent sections.

As discussed in section 6.2.2, students and 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 and learning. There are several factors that motivate and discourage both lecturers and students to adopt or not to adopt these technologies in learning and teaching.

Results from the questionnaire indicate that between 77 (56.6%) and 131 (96.3%) students use these technologies because they have necessary knowledge, the technologies fit with their learning activities and because they access them for free. Results show further 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 education activities.

Looking through the lens of the DTPB model, it is possible to explain how attitude (compatibility, perceived usefulness and ease of use) propels students and 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 potential existing values and experiences and also if individuals believe that the technology can improve their job performance. In the present study, lecturers and students have accepted these technologies because they marry well with and add value to their existing learning and teaching practices. For example, collaborative learning, communication, storing of data, searching and sharing of information are some of the routine activities that students and 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. Taylor and Todd (1995) define ease of use as the degree to which an innovation is easy to understand and operate or the degree to which a particular technology is free of effort. The findings fully support the DTPB perspective because students and lecturers have adopted only those technologies which they have skills to use them implying that possession of necessary knowledge and skills are the key determinants for the adoption of Web 2.0 technologies. Similar findings are reported by Gaffar, Singh and Thomas (2011) who explored the readiness of lecturers and students at a Caribbean University for the adoption of Web 2.0 in the education process. These researchers indicate that perceived usefulness, ease of use and compatibility which are the constructs of the DTPB motivate lecturers and students because they (students and lecturers) believed that Web 2.0 technologies improve their performance, are easy to use and are compatible with their learning and teaching experiences.

In terms of perceived behaviour control (self-efficacy and resource facilitating condition and technology facilitating condition), another construct of the DTPB model, it is the technology facilitating condition which is clearly noticeable in the study. In this model, Taylor and Todd (1995) postulate that individuals are likely to accept technologies if there are favourable conditions or facilitating conditions such as computers and Internet. Students use computers

provided by the library which are available in the Internet room where they access the Internet for free. Likewise, lecturers access these technologies in their offices. To this end, the availability of computers connected to the Internet accessible in the library and staff rooms have positively influenced students and lecturers to adopt these technologies respectively.

As observed in section 6.2.2, results of the study suggest that the level of adoption of Web 2.0 technologies is not very satisfying. In fact, less than 36 (26.5%) students and only a few lecturers indicate 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 students and lecturers use some of these technologies such as Facebook and LinkedIn to accomplish personal activities. This section dwells on discussing some of the reasons that contributed to this poor adoption.

Some researchers (Franklin & Harmelen, 2007; 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 were faced with a similar challenge. The following statement made by one of the lecturers during the interviews tells it all about the seriousness of this challenge:

> *"Even myself 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.

Although the questionnaire data show that most students do not complain about frequent electricity outages as a hindrance factor, interviews with lecturers have revealed that blackouts are a reality only that smart phones have nullified this problem by allowing students and 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 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 teaching and learning in some other African universities. For example, Lwoga (2012) assessed the extent to which Web 2.0 technologies were utilised to support learning and teaching 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 & 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 problem stymies the adoption of Web 2.0 technologies by students and 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).

Although the Internet problem has not emerged to be very critical, it frustrates some students and lecturers in adopting these technologies. It appears that MZUNI has relatively improved Internet services because Nyirongo (2009) labelled poor Internet as one of the key inhibiting factors in the use of Internet technologies in teaching by lecturers.

6.3. Conclusion

This chapter sought to answer the four research questions which were identified in Chapter One about the use of Web 2.0 technologies in teaching and learning amongst students and lecturers at the Faculty of ISC at MZUNI, Malawi. To achieve this, results from Chapters Four and Five were aggregated and synthesised, compared with similar results reported by other researchers particularly, those reviewed in Chapter Two and finally, the findings were put under microscope with the help of the DTPB model which underpinned the study.

The next chapter (Chapter Seven) will provide the conclusions and recommendations.

CONCLUSION AND RECOMMENDATIONS

7.1. Introduction

The study set out to investigate the use of Web 2.0 technologies in teaching and learning at the Faculty of ISC at MZUNI in Malawi. Bloomberg and Volpe (2012:11) recommend that the content of conclusions and the subsequent recommendations should arise from asking the questions: "Knowing what I now know [from the study], what conclusion can I draw?" and "Knowing what I now know to be true, I recommend that..." respectively. The researcher follows the same logic to come up with the conclusions and recommendations as will be discussed in the sections below.

7.2. Conclusion

The main empirical findings were summarised in Chapters Four and Five and those findings were collectively synthesised in Chapter Six to provide answers to the research questions listed above. This section provides some reflections distilled from the diverse insights realised from Chapters Four, Five and Six.

First, nearly all students and lecturers know about the plethora of Web 2.0 technologies which could be used in teaching and learning, thanks to the proliferation of mobile phones which support most of these technologies and also because of their inclusion in the curricula. Students and lecturers are not only aware of Web 2.0 technologies but also possess technical skills for using some of these technologies. Nevertheless, familiarity (ability to use the technologies) is fairly complex and can be attained through formal or informal training but findings of this study show that the inclusion of Web 2.0 in the curricula has proved decisive in the adoption or use of some of these technologies. The only glitch is that the curriculum, which is the nucleus of most academic activities, does not contain many of the Web 2.0 technologies. Additionally, issues to do with lack of Wi-Fi and limited access to the faculty computer laboratory have narrowed students' and lecturers' possibilities for accessing Web 2.0 technologies.

Second, regardless of the scale of use, the bottom line is that all students and 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 students and lecturers to search for valuable information or content, communicate (administering assignments and receiving feedback) and to conduct collaborative learning. Interestingly, nearly all students and lecturers predominantly use Wikipedia, Google Apps, YouTube, WhatsApp, BBM and Twitter. Reading between the lines, the Web 2.0 technologies mostly used correspond well with the academic activities that students and lecturers perform. One of the most noteworthy observations is that there is a considerable dividing line between using Web 2.0 technologies for personal activities and for academic work. Knowledge has emerged from the study that some of the Web 2.0 technologies such as Facebook that are commonly used by students and lecturers in their personal spaces are rarely or not used at all for educational purposes.

Third, Web 2.0 technologies come along with a wealth of opportunities and benefits in teaching and learning that students and lecturers are already exploiting by evidently adopting some of these technologies. Diverse benefits of Web 2.0 technologies have been noted from the study. In summary, quick and cheap communication, easy access to information, 24/7 collaborative learning and enhanced self-learning at one's convenience and pace are the prime benefits which have made a reality by using technologies such as Wikipedia, Google Apps, Twitter and BBM and YouTube.

Finally, the DTPB, a model on which the study is designed or based has unequivocally and 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 students and lecturers to use various Web 2.0 technologies, no clear evidence has been noted to prove that students are encouraged by their colleagues or lecturers and lecturers by students, colleagues or their seniors. Web 2.0 technologies facilitate lecturer student communication, collaborative learning and more importantly, easy access to information or course content and this has influenced students and lecturers to integrate some of these technologies in teaching and

learning. On the other hand, Internet access remains the recurrent key stumbling blocks towards a successful adoption of Web 2.0 technologies in learning and teaching.

7.3. Recommendations

As explicitly stated in Chapter One, one of the significant outcomes of the study is to provide policy makers with a framework for guiding a successful integration of Web 2.0 technologies in teaching and learning. To achieve this, the researcher has compiled the following recommendations which are in light of the findings of this investigation:

- Although students and lecturers have adopted some Web 2.0 technologies, it has been revealed that a good number of technologies that could be equally used for academic purposes are yet to be adopted. This is mainly because some Web 2.0 technologies are not popular in Malawi in addition to the fact that new Web 2.0 technologies continue to emerge on regular basis. The researcher therefore recommends the need for the Faculty of ISC to introduce on-going awareness and training programmes on new technologies so as to keep students and lecturers abreast of, raise awareness about, improve skills and know-how of the dynamic developments about these technologies;

- The findings show that attitude (perceived usefulness, ease of use and compatibility) and perceived behaviour control (self-efficacy, resource facilitating condition and technology facilitating condition) are strong determining factors for students' and lecturers' intentions to integrate Web 2.0 technologies in their academic activities. The researcher recommends that the recently established Department of ICT Directorate at MZUNI and other stakeholders whose responsibility is to promote the use of technologies such as Web 2.0 in learning and teaching at MZUNI should focus their effort on improving the perceived usefulness, ease of use and compatibility with current practices of Web 2.0 applications. This should be achieved by conducting workshops, integrating more aspects or elements of Web in the modules and by making available financial resources for students and lecturers to attend both, local and international conferences related to Web 2.0; and

- The study has established that though Internet connectivity is good, access is restricted to the library for most students and to offices for lecturers as there is no Wi-Fi across the campus. The study recommends that the newly established Department of the ICT

Directorate with support from MZUNI management should kick start its duties by making sure that the university campus has a robust and reliable Internet including the installation of a campus-wide Wi-Fi so that students can access Internet technologies such as Web 2.0 using their smart phones and laptops anywhere on campus premises.

7.4. Limitations of the study

Globler (2005:10) argues that to avoid being penalised, it is important for postgraduate researchers to reflect and highlight in the final chapter of the master's or PhD thesis any limitations that the readers especially internal and external examiners should bear in mind when evaluating the findings, conclusions and recommendations and Assan (2014) adds that the limitations should end on a positive note to show how they worked together to provide focus and strengthen the empirical results. Indeed, the study has offered an assessment perspective on the use of Web 2.0 technologies in learning and teaching but it suffered one major limitation mainly resulting from the research design. The study focused on a single faculty at MZUNI to cut back costs and to maximise chances of finishing the thesis within the time specified by UWC – LIS department. Thus, all the participants came from the Faculty of ISC leaving out other four faculties at MZUNI implying that the findings have limited chances of being generalised to other populations.

7.5. Areas of further study

The findings of this research have initiated some thoughts for further research as suggested below.

- It has been revealed in the study that the highest number of students and lecturers access Web 2.0 technologies using smart phones which are part of the mobile technology. By building on the findings of the current research, a study needs to be conducted to investigate the opportunities and challenges of mobile technologies in teaching and learning and at MZUNI and other universities in Malawi; and

- One of the key points that has come out very clearly in the study is that lecturers are of the view that students should be exposed to Web 2.0 technologies in order to prepare them for their work places where it is reported that the use of these technologies is prevalent. Since it is explicitly revealed in the curricula that some Web 2.0 and related

technologies are taught in class, a study needs to be conducted targeting alumni of the Faculty to find out how the technology related courses are benefiting them in their work places.

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Questionnaire for students in the Faculty of ISC at MZUNI – Malawi

Dear respondent,

My name is Winner Chawinga, a master's student in the department of Library and Information Science at the University of the Western Cape, in Cape Town, South Africa.

I wish to invite you to participate in a study I am carrying out as part of the requirements for the Master of Information Science degree.

The aim of the study is to investigate the use of Web 2.0 in teaching and learning by lecturers and students in the Faculty of Information Science and Communications at Mzuzu University.

Below is a brief questionnaire that takes a variety of questions about the use of Web 2.0 technologies in teaching and learning. Your assistance in answering the questions will be highly appreciated.

In line with the ethical guidelines of the Senate Research Committee of the University of the Western Cape, I will maintain confidentiality and anonymity of records identifying you as a participant.

I want to acknowledge the time and effort it would take to participate in this study and wish to express my gratitude in advance for your participation and contribution to the completion of the study.

If you have any questions or concerns or wish to know more about this study, please contact Dr Sandy Zinn, my supervisor, at the University of the Western Cape on szinn@uwc.ac.za or contact me on winnchawinga@gmail.com.

If you have decided not to participate in this study, you are free to so,

If:
- You confirm that you have read and understood the information in the sheet and agree to take part in this research; and
- You understand that your participation is voluntary and you are free to withdraw at anytime without giving any reason,
then proceed to voluntarily answer the questions and submit your completed questionnaire by clicking on "Submit".

Section A: background information

1.What is your gender?

○ Male

○ Female

2. What is the name of your department?

○ LIS

○ ICT

3. Indicate your level of study.

○ 2

○ 3

○ 4

Section B: awareness of and familiarity with Web 2.0 technologies

4. Which of the following Web 2.0 technologies are you aware of? You may select more than one.

- ☐ Facebook
- ☐ Twitter
- ☐ Wikipedia
- ☐ Google Apps
- ☐ Flickr
- ☐ Blog
- ☐ LinkedIn
- ☐ WhatsApp
- ☐ RSS Feeds
- ☐ YouTube
- ☐ Picasa
- ☐ Podcasts
- ☐ Viber
- ☐ Delicious
- ☐ Dropbox
- ☐ Skype
- ☐ Other: _____

5. Please list your level of proficiency with the following Web 2.0 technologies by selecting from the options 1 to 5 for each Web 2.0.

Key: 1 = "Very competent", 2 = "Competent", 3 = "Novice", 4 = "Incompetent", 5 = " Very incompetent"

	1	2	3	4	5
Facebook	○	○	○	○	○
Twitter	○	○	○	○	○
Wikipedia	○	○	○	○	○
Google Apps	○	○	○	○	○
Flickr	○	○	○	○	○
Blog	○	○	○	○	○
LinkedIn	○	○	○	○	○
WhatsApp	○	○	○	○	○
RSS Feeds	○	○	○	○	○
Viber	○	○	○	○	○
Picasa	○	○	○	○	○
YouTube	○	○	○	○	○
Podcasts	○	○	○	○	○
Delicious	○	○	○	○	○
Dropbox	○	○	○	○	○
Skype	○	○	○	○	○

6. Which of the following devices do you use to connect to the Web 2.0 technologies? You may select more than one.

- ☐ Laptop
- ☐ Desktop computer
- ☐ iPad / Tablets
- ☐ Smart phone
- ☐ Other: [＿＿＿＿＿＿＿＿]

7. Where do you normally access the Web 2.0 technologies? You may select more than one.

- ☐ Library
- ☐ Faculty computer laboratory
- ☐ Hot spot on campus
- ☐ Use modem from ISP at home
- ☐ Internet Café out side the university
- ☐ American Corner
- ☐ Other: [＿＿＿＿＿＿＿＿]

Section C: purpose of Web 2.0 technologies

8. In general, what do you use Web 2.0 technologies for? You may select more than one.

- ☐ Job hunting
- ☐ Specific school work (assignments, projects)
- ☐ Social activities e.g. making new friends
- ☐ Other: [＿＿＿＿＿＿＿＿]

9. Winch of the following academic activities do you accomplish using Web 2.0 technologies? You may select more than one.

- ☐ To submit assignment
- ☐ To work in collaboration with fellow students
- ☐ To communicate with friends on academic work
- ☐ To communicate with lecturers
- ☐ To get in touch with professionals in my study field
- ☐ To search for information
- ☐ To share content with fellow students
- ☐ Other: [＿＿＿＿＿＿＿＿]

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10. Which Web 2.0 technologies do you usually use to accomplish the academic activities? Select from the options 1 to 5 for each Web 2.0.

Key: 1 = " Most used" 2 = "Occasionally used" 3 = "Least used" 4 = "Not sure" 5 = "Never used"

	1	2	3	4	5
Facebook	○	○	○	○	○
Wikipedia	○	○	○	○	○
Google Apps	○	○	○	○	○
Flickr	○	○	○	○	○
Delicious	○	○	○	○	○
Blog	○	○	○	○	○
LinkedIn	○	○	○	○	○
WhatsApp	○	○	○	○	○
RSS Feeds	○	○	○	○	○
Viber	○	○	○	○	○
Picasa	○	○	○	○	○
YouTube	○	○	○	○	○
Podcasts	○	○	○	○	○
Twitter	○	○	○	○	○
Dropbox	○	○	○	○	○
Skype	○	○	○	○	○

Section D: factors for use or non-use of Web 2.0 technologies

11. What are the main reasons that motivate you to integrate Web 2.0 technologies in your educational activities? Select from options 1 to 5 for each reason.

Key: 1 = "Strongly agree", 2 = "Agree", 3 = "Neutral" = 4, "Disagree", 5 "Strongly disagree"

	1	2	3	4	5
I access them for free	○	○	○	○	○
I use them because my lecturers want me to use them	○	○	○	○	○
I use them because my fellow students want me to use them	○	○	○	○	○
I use Web 2.0 technologies beacuse they fit well with the way I learn	○	○	○	○	○
I have the knowledge and ability to use Web 2.0	○	○	○	○	○

12. What are the reasons that discourage you from using Web 2.0 technologies in your educational activities? Select from options 1 to 5 for each reason.

Key: 1 = "Strongly agree", 2 = "Agree", 3 = "Neutral" = 4, "Disagree", 5 "Strongly disagree"

	1	2	3	4	5
I do not have necessary skills to use such technologies	○	○	○	○	○
I do not have access to computers	○	○	○	○	○
I am very busy and it takes me too much time to use these tools	○	○	○	○	○
I think using Web 2.0 technologies put my privacy at risk	○	○	○	○	○
I do not use Web 2.0 because of lack of technical support	○	○	○	○	○
I do not use Web 2.0 because the Internet is very poor	○	○	○	○	○
I do not use Web 2.0 because there is frequent electricity outages	○	○	○	○	○

End of questions. Thank you for participating in this study.

Submit

Never submit passwords through Google Forms.

Appendix B. Questionnaire for lecturers

Questionnaire for lecturers in the Faculty of ISC at MZUNI – Malawi

Dear respondent,

My name is Winner Chawinga, a master's student in the department of Library and Information Science at the University of the Western Cape, in Cape Town, South Africa.

I wish to invite you to participate in a study I am carrying out as part of the requirements for the Master of Information Science degree.

The aim of the study is to investigate the use of Web 2.0 in teaching and learning by lecturers and students in the Faculty of Information Science and Communications at Mzuzu University.

Below is a brief questionnaire that takes a variety of questions about the use of Web 2.0 technologies in teaching and learning. Your assistance in answering the questions will be highly appreciated.

In line with the ethical guidelines of the Senate Research Committee of the University of the Western Cape, I will maintain confidentiality and anonymity of records identifying you as a participant.

I intend to conduct follow-up interviews with you on the same topic of study. Please, if willing to be interviewed, leave your email address at the end of this questionnaire so that I can contact you. Your email will be used only for this exercise.

I want to acknowledge the time and effort it would take to participate in this study and wish to express my gratitude in advance for your participation and contribution to the completion of the study.

If you have any questions or concerns or wish to know more about this study, please contact Dr Sandy Zinn, my supervisor, at the University of the Western Cape on szinn@uwc.ac.za or contact me on winnchawinga@gmail.com.

If you have decided not to participate in this study, you are free to so,

If:
- You confirm that you have read and understood the information in the sheet and agree to take part in this research; and
- You understand that your participation is voluntary and you are free to withdraw at anytime without giving any reason,
then proceed to voluntarily answer the questions and submit your completed questionnaire by clicking on "Submit".

Section A: background information

1. What is your gender?

○ Male
○ Female

2. What is the name of your department?

○ LIS
○ ICT

3. What is your qualification?

○ Bachelors
○ Masters
○ PhD
○ Other: [_____]

4. What is your designation?

○ Senior Lecturer
○ Lecturer
○ Staff Associate
○ Professor
○ Assistant Lecturer
○ Other: [_____]

Section B: awareness of and familiarity with Web 2.0 technologies

5. Which of the following Web 2.0 technologies are you aware of? You may select more than one

☐ Facebook
☐ Twitter
☐ Wikipedia
☐ Google Apps
☐ Flickr
☐ Blog
☐ LinkedIn
☐ WhatsApp
☐ RSS Feeds
☐ YouTube
☐ Picasa
☐ Podcasts
☐ Viber
☐ Delicious
☐ Dropbox
☐ Skype
☐ Other: [_____]

6. Please list your level of proficiency with the following Web 2.0 technologies by selecting from the options 1 to 5 for each Web 2.0.

Key: 1 = "Very competent", 2 = "Competent", 3 = "Novice", 4 = "Incompetent", 5 = " Very incompetent"

	1	2	3	4	5
Facebook	○	○	○	○	○
Twitter	○	○	○	○	○
Wikipedia	○	○	○	○	○
Google Apps	○	○	○	○	○
Flickr	○	○	○	○	○
Blog	○	○	○	○	○
LinkedIn	○	○	○	○	○
WhatsApp	○	○	○	○	○
RSS Feeds	○	○	○	○	○
Viber	○	○	○	○	○
Picasa	○	○	○	○	○
YouTube	○	○	○	○	○
Podcasts	○	○	○	○	○
Delicious	○	○	○	○	○
Dropbox	○	○	○	○	○
Skype	○	○	○	○	○

7. Which of the following devices do you use to connect to the Web 2.0 technologies? You may select more than one.

☐ Laptop
☐ Desktop computer
☐ iPad / Tablets
☐ Smart phone
☐ Other: _____

8. Where do you normally access the Web 2.0 technologies? You may select more than one.

☐ Library
☐ Faculty computer laboratory
☐ Hot spot on campus
☐ Use modem from ISP at home
☐ Internet Café out side the university
☐ American Corner Internet Café
☐ In office
☐ Other: _____

Section C: purpose of Web 2.0 technologies

9. In general, what do you use Web 2.0 technologies for?

_____

10. What are some of the specific education activities that you perform using Web 2.0 technologies?

_____

11. Which Web 2.0 technologies do you usually use to accomplish the academic activities? Select from the options 1 to 5 for each Web 2.0.

Key: 1 = " Most used" 2 = "Occasionally used" 3 = "Least used" 4 = "Not sure" 5 = "Never used"

	1	2	3	4	5
Facebook	○	○	○	○	○
Wikipedia	○	○	○	○	○
Google Apps	○	○	○	○	○
Flickr	○	○	○	○	○
Delicious	○	○	○	○	○
Blog	○	○	○	○	○
LinkedIn	○	○	○	○	○
WhatsApp	○	○	○	○	○
RSS Feeds	○	○	○	○	○
Viber	○	○	○	○	○
Picasa	○	○	○	○	○
YouTube	○	○	○	○	○
Podcasts	○	○	○	○	○
Twitter	○	○	○	○	○
Dropbox	○	○	○	○	○
Skype	○	○	○	○	○

Section D: benefits of Web 2.0 technologies

12. To what extent do you agree about some of the following benefits associated with the use of Web 2.0 technologies. Select from options 1 to 5 for each benefit.

Key: 1 = Strongly agree", 2 = " Agree", 3 = "Neutral", 4 = " Disagree", 5 = "Strongly disagree"

	1	2	3	4	5
Web 2.0 helps me improve my skills in using technology	○	○	○	○	○
Web 2.0 facilitates collaborative learning	○	○	○	○	○
Web 2.0 helps me keep updated in my research field	○	○	○	○	○
Web 2.0 helps me to communicate with students beyond classroom hours	○	○	○	○	○
Web 2.0 improves knowledge sharing and collaboration	○	○	○	○	○
Web 2.0 improves teachers' interdepartmental communication	○	○	○	○	○
Web 2.0 helps me save time and costs (i.e. travelling is less necessary)	○	○	○	○	○

13. Apart from the benefits listed in question 12, what do you think are the other benefits of incorporating Web 2.0 in teaching and learning?

14. What do you think are the advantages for adopting Web 2.0 technologies in a classroom environment? Select from the options 1 to 5 for each advantage.

Key: 1 = "Strongly agree", 2 = "Agree", 3 ="Neutral", 4 = "Disagree", 5 = "Strongly disagree"

	1	2	3	4	5
They help me receive immediate feedback from my students	○	○	○	○	○
They help me post my teaching resources (video, slides) online	○	○	○	○	○
They help me create a more accessible, portable, durable, and interactive educational portfolio	○	○	○	○	○
They help my students to develop skills and capabilities for working in collaboration	○	○	○	○	○
They help me create information resources and share content with my students	○	○	○	○	○
They help me better identify students' interests and use of teaching resources	○	○	○	○	○

15. Apart from the advantages listed in question 14 above, what do you think are the other advantages for adopting Web 2.0 technologies in a classroom environment?

16. Why do you think students should be exposed to various Web 2.0 technologies?

Section E: factors for use or non-use of Web 2.0 technologies

17. What are the main reasons that motivate you to integrate Web 2.0 technologies in your educational activities? Select from options 1 to 5 for each reason.

Key: 1 = "Strongly agree", 2 = "Agree", 3 = "Neutral" = 4, "Disagree", 5 "Strongly disagree"

	1	2	3	4	5
I use them because I am personally comfortable using them	○	○	○	○	○
I have the knowledge and ability to use Web 2.0	○	○	○	○	○
I access them for free	○	○	○	○	○
I use Web 2.0 technologies because they fit well with the way I teach	○	○	○	○	○
I use them because my head of department and the dean require me to use them	○	○	○	○	○
I use them because students want me to use them	○	○	○	○	○

18. Apart from the reasons that you have selected in question 17, what are the other reasons that motivate you to integrate Web 2.0 tools in your teaching activity?

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19. What are the reasons that discourage you from using Web 2.0 technologies in your educational activities? Select from options 1 to 5 for each reason.

Key: 1 = "Strongly agree", 2 = "Agree", 3 = "Neutral" = 4, "Disagree", 5 "Strongly disagree"

	1	2	3	4	5
I do not have necessary skills to use such technologies	○	○	○	○	○
I do not have access to computers	○	○	○	○	○
I am very busy and it takes me too much time to use these tools	○	○	○	○	○
I think using Web 2.0 technologies put my privacy at risk.	○	○	○	○	○
I do not use Web 2.0 because of lack of technical support	○	○	○	○	○
I think they are a fad and more for intertainment	○	○	○	○	○
I can teach just as well without them	○	○	○	○	○

If your are willing to be interviewed on the same topic, please leave your email address here

[   ]

End of questions. Thank you for participating in this study.

Submit

100%: You made it.

Appendix C. Interview protocol for lecturers

Interview protocol for lecturers in the Faculty of ISC at MZUNI – Malawi

Tell me about yourself.

Gender: Male ☐   Female ☐

Department: LIS ☐   ICT ☐

Name of lecturer (numbers to be used i.e. lecturer 1)
1. What are the course(s) that you are teaching?
2. Tell me, how do you understand the term Web 2.0?
3. Which Web 2.0 do you primarily use for academic work other than for private or personal activities?
4. Which Web 2.0 technologies have you ever used to communicate with students and fellow lecturers on academic work?
5. What kind of collaborative learning activities have you set so that students can use Web 2.0?
6. Most lecturers said they could teach LIS and ICT courses as well without Web 2.0. Suggest why it was said and what was meant.
7. Of 136 students who answered the questionnaire, only 48 (35.3%) indicated they were encouraged by their lecturers to use Web 2.0 in their academic activities while the rest, said they were not. How would you respond to these claims? -
8. Tell me about the research environment at Mzuzu University in relation to Web 2.0
9. Have you conducted any studies or written papers in relation to Web 2.0 whose findings have been published?
10. Do you attend international or local conferences or workshops where Web 2 is dealt with?
11. Web 2.0 is part of LIS and ICT curriculum. How do you address Web 2.0 elements in your courses?
12. Only seven (16.2%) of 43 LIS and eight (18.8%) of 44 ICT courses that were analysed mentioned Web 2.0 explicitly. Are there plans to integrate Web 2.0 in your courses? Or what measures are you taking to integrate them?
13. Some Web 2.0 technologies such as RSS Feeds, Delicious, Viber just to mention a few, were underutilised by most students and lecturers. Could you suggest the reason?
14. Most students did not pinpoint frequent electricity blackouts as an impeding factor to their use of Web 2.0 despite many researchers constantly claiming that electricity in one of the major militating factors in Africa. Can you paint the picture about the reliability of electricity at Mzuzu University? Are you agreeable to the views expressed by the students?

Appendix D. Content analysis schedule

Content analysis schedule for the curricula of the Faculty of ISC at MZUNI - Malawi

Section A: general information

   a) Name of department --
   b) Name of the course/module title--
   c) Semester/level the course is offered
   d) Duration of the course/module--

Section B: Web 2.0 contents in the module

   a) Course outline
   Elements/types of Web 2.0 ---
   Purpose of Web 2.0 ---

   b) Recommended texts/recommended readings
   Elements/types of Web 2.0 ---
   Purpose of Web 2.0 ---

   c) Assignments/exercises
   Elements/types of Web 2.0 ---
   Purpose of Web 2.0 ---

   d) Lecture notes
   Elements/types of Web 2.0 ---
   Purpose of Web 2.0 ---
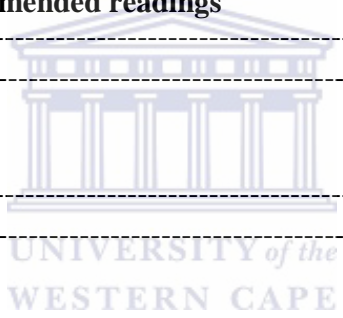
Appendix E. Web 2.0 in LIS and ICTcurricula

Web 2.0 in the curricula of the Faculty of ISC at MZUNI - Malawi

<table>
<tr><td colspan="4" align="center">Web 2.0 in LIS Curriculum</td></tr>
<tr>
<th>Courses</th>
<th>Documents analysed</th>
<th>Web 2.0 technologies</th>
<th>Extracts about Web 2.0 technologies from the documents</th>
</tr>
<tr>
<td rowspan="2">End User Computing (ICT1101)</td>
<td>Course outline</td>
<td>Twitter
Blogs
Wikis
YouTube</td>
<td>• "Students should be able to use media sharing sites such as Twitter, Blogs, YouTube, Wikis, etc."</td>
</tr>
<tr>
<td>Assignments</td>
<td>Twitter
Google Apps</td>
<td>• "The etiquette guidelines that govern behaviour when communicating on the Internet have become known as netiquette (Shea, 2004). Discuss the rules that govern communication using email. Create and share a document on Google Drive on which every member of the group should be able to contribute. Share the document with me before Friday, 11 October 2013".
• "I will tweet some important information about this exercise so make sure you follow me on Twitter (@******)".</td>
</tr>
<tr>
<td rowspan="2">Computer and Communication Technology (ICT1103)</td>
<td>Assignments</td>
<td>WhatsApp
Twitter</td>
<td>• "Find *five* websites about how to evaluate online information and tweet on my account".
• "If you have any problem please text or send me a WhatsApp message on +265*********".</td>
</tr>
<tr>
<td>Lecture notes</td>
<td>YouTube</td>
<td>• "You can learn more about LANs by visiting the following video link: https://www.youtube.com/watch?v=EuuTjoSdjvU"</td>
</tr>
<tr>
<td>Information Literacy (LIS1102)</td>
<td>Prescribed learning resources</td>
<td>Wikis</td>
<td>• http://wikis.ala.org/acrl/index.php/Informationliteracyinthedisciplines".</td>
</tr>
<tr>
<td>Organization of Knowledge: Classification (LIS2406)</td>
<td>Lecture notes</td>
<td>Facebook
Twitter</td>
<td>• "You can follow the Library of Congress on Facebook and Twitter for some up-dates on cataloguing and classification.
Facebook: https://www.facebook.com/libraryofcongress
Twitter: https://twitter.com/librarycongress/".</td>
</tr>
<tr>
<td rowspan="3">Web Design (ICT2402)</td>
<td>Course outline</td>
<td>Twitter
YouTube
Sound Cloud
RSS Feeds</td>
<td>• "Students should be able to embed new media technologies such as Facebook, Twitter, YouTube, RSS Feeds and Sound Clouds to the websites [they create]".</td>
</tr>
<tr>
<td>Assignments</td>
<td>Twitter</td>
<td>• "Find *five* websites on the Internet about qualities of good website and tweet on my account (@******) before 8th May, 2014".</td>
</tr>
<tr>
<td></td>
<td>Social media</td>
<td>• "Magazine, D. L. 2011. Digital librarianship & social</td>
</tr>
</table>

Digital Librarianship (LIS3502)	Prescribed/ recommended texts	Google Alert RSS Search Feeds Twitter Search Delicious Google's Blog Search Facebook	media: the digital library as conversation facilitator. *D-Lib Magazine*, *17*(7/8)" (The researcher retrieved and checked the contents of this article and found the listed Web 2.0 technologies).
Cyber-analytics (LIS2408)	Lecture notes	YouTube	• "You can learn more about how Cyber Analytics can combat network intrusion and advanced persistent threats (APT) in this YouTube video: https://www.youtube.com/watch?v=ZK6bWySnkPw &feature=youtu.be".

<div align="center">

Web 2.0 in ICT Curriculum

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Courses	Document analysed	Web 2.0 technologies	Extracts about Web 2.0 technologies from the documents
End User Computing (ICT 1101)	Course outline	Twitter Blogs Wikis YouTube	• "Students should be able to use media sharing sites such as Twitter, Blogs, YouTube, Wikis, etc.".
	Assignments	Twitter Google Apps	• "The etiquette guidelines that govern behaviour when communicating on the Internet have become known as netiquette (Shea, 2004). Discuss the rules that govern communication using email. Create and share a document on Google Drive on which every member of the group should be able to contribute. Share the document with me before Friday, 11 October 2013" • "I will tweet some important information about this exercise so make sure you follow me on Twitter (@nayeja)".
Computer and Communication Technology (ICT 1103)	Assignments	WhatsApp Twitter	• Find *five* websites about how to evaluate online information and tweet on my account" • "If you have any problem please text or send me a WhatsApp massage on +265999670044"
	Lecture notes	YouTube	• "You can learn more about LANs by visiting the following video link: https://www.youtube.com/watch?v=EuuTjoSdjvU".
PC Management and Maintenance (ICT 1201)	Course outline	YouTube	• "Teaching and learning resources: Personal computer, Ground strap, Screwdrivers, Internet and YouTube videos".
	Assignments	Wikis, Podcasts YouTube Google+	• "Each group member is expected to find two Wiki pages, two YouTube videos and two Podcasts on how an operating system works with hardware and other software. Share the URLs of these technologies and websites with other groups members using Google+".

Programming in Pascal (ICT 1401)	Lecture notes	YouTube	• "You can learn more about Delphi and Lazarus development environments by watching a YouTube video available at: https://www.youtube.com/watch?v=ugL4buACucw"
Web Design (ICT 2402)	Course outline	Twitter YouTube Sound Cloud RSS Feeds	• "Students should be able to embed new media technologies such as Facebook, Twitter, YouTube, RSS Feeds and Sound Clouds to the websites [they create]".
	Assignments	Twitter	• "Find five websites on the Internet about qualities of good website and tweet on my account (@******) before 8th May, 2014".
Mobile Telecommunications (ICT 3504)	Prescribed learning resources	Social media Mobile-Telephony Skype	• "Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. 2010. *Social Media & Mobile Internet Use among Teens and Young*. Pew Internet & American Life Project". • Wilson, J. 2006. 3G to Web 2.0? Can mobile telephony become an architecture of participation? Convergence, *The International Journal of Research into New Media Technologies,* 12(2), 229-242. • Goggin, G., & Hjorth, L. 2009. *Mobile technologies: From telecommunications to media.* Taylor & Francis".
Emerging Issues in ICT	Course outline	Social media	• "Students should be able to know some emerging/new/social media technologies".
Electronic Commerce (ICT 4802)	Lecture notes	Blogs	• "A list of the top 25 blogs about Electronic Commerce is available at: http://www.blogmetrics.org/ecommerce".
Multimedia (ICT 1203)	Assignments	YouTube Twitter Google+	"Using a digital camera/video camera and Windows Movie Maker, each group should create a video in which you should explain the distinctions between the three forms of synchronization (synchronous distributed state, media synchronization and external synchronisation) that may be required in distributed multimedia applications. Suggest mechanisms, by which each of them could be achieved, for example in a videoconferencing application. 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+".

Appendix F. Request for permission to conduct a study

Request for permission to conduct a study in the Faculty of ISC at MZUNI - Malawi

Department of Library and information Science
Faculty of Arts
University of the Western Cape
Private Bag X17
Hector Petersen Residence
Belleville
7535
E-mail: winnchawinga@gmail.com
16th April, 2014.

The Deputy Vice Chancellor
Mzuzu University
Private Bag 201
Luwinga
Mzuzu 2
M A L A W I

Dear Madam,

Request for permission to conduct a study at your university

I am Winner Chawinga, a Master's student in the department of Library and Information Science at the University of the Western Cape – South Africa.

As partial fulfilment of the requirements of Master's Degree in the Department of Library and Information Science, Faculty of Arts, University of the Western Cape – South Africa, I am supposed to conduct a research study of which its outcome will be a Min-Thesis. My research topic is "The use of Web 2.0 in teaching and learning at Mzuzu Univer*sity's Faculty of Information Science and Communications, Malawi"*.

I am currently doing Chapter Three (Research design methodology). My research strategy is a case study and it involves distributing a Web - based questionnaire to students and lecturers, and also conducting interviews with some lecturers in the faculty.

I, therefore, write to request for permission to conduct a study in the Faculty of Information Science and Communications. Please, find attached an abstract of the research proposal for more information.

I trust my application will meet your favourable consideration.

Yours sincerely,

Winner Chawinga

Appendix G. Permission to conduct a study

Permission to conduct a study in the Faculty of ISC at MZUNI – Malawi

MZUZU UNIVERSITY

OFFICE OF THE DEPUTY VICE CHANCELLOR

Mzuzu University
Private Bag 201
Luwinga
Mzuzu 2
M A L A W I

Tel: (265) (01) 320 105
Fax: (265) (01) 320 497/568/505
Email: kaunda.l@mzuni.ac.mw

April 25, 2014

Mr. Winner Chawinga
Department of Library and information Science
Faculty of Arts
University of the Western Cape
Private Bag X17
Hector Petersen Residence
Belleville
7535

Dear Sir,

Re: request for permission to conduct a study at Mzuzu University

Permission is hereby granted for you to conduct research in the Faculty of Information Science and Communications.

By copy of the letter, I am advising Heads of the LIS and ICT departments, the Dean of the Faculty (ISC) and the University Librarian to offer you all the necessary support by arranging access to the computer laboratories and Internet room for the students to complete the Web-based questionnaire.

I wish you all the best in your research.

Ms. Loveness Kaunda
DVC

Cc:
     Head of Department: LIS
     Head of Department: ICT
     Dean of Faculty: ISC
     University Librarian