KNOWLEDGE, ATTITUDES AND PRACTICES OF UNIVERSITY STUDENTS ON WEB 2.0 TOOLS: IMPLICATIONS FOR ACADEMIC LIBRARIES IN ZIMBABWE

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Abstract

Web 2.0 technologies have provided both opportunities and challenges for academic libraries. These socio-technological innovations have enabled interactivity and gathering of knowledge through experience and practice on a global scale. The concept of collaborative work, social networking and the ease in the usage of these applications has brought a significant change in the internet usage by university students. Many academic libraries are beginning to leverage the power of these services to provide better and more relevant services to their patrons. The use of web 2.0 tools in academic libraries and has begun to take shape recently in Zimbabwe. However, studies reveal that utilisation these tools is still low in Zimbabwean academic libraries. Understanding knowledge, attitudes and practices of university students on web 2.0 tools paves the way for the efficient and effective use of these tools in Zimbabwean libraries. This study aimed at determining the knowledge, attitudes and practices of university students on web 2.0 tools. The survey method was used to gather data. A self administered questionnaire was used to gather data from 280 undergraduate students who were conveniently selected to participate in the study. The findings reveal that most students have excellent knowledge of specific web 2.0 tools such as Instant Messaging and Social networking. Most tools were used mainly for communication purposes. A small percentage of respondents indicated that they use the tools for educational purposes. Students displayed lack of knowledge and use on mashups, social bookmarks, and relatively simple syndication (RSS) feeds. The fact that most of these tools are already being widely used by students entail that academic libraries can utilise these technologies in developing user services. However, the issues of awareness, access, confidentiality, and accuracy of these tools need to be addressed to ensure their successful implementation and use.

Keywords

Web 2.0, social media, internet, academic libraries, university students

1.1 INTRODUCTION

An increasing number of library users are using the web to access information (Zickuhr, Rainie, and Purcell, 2013), and the use of web-based services in libraries has risen drastically over the years (Zickuhr and Rainie, 2014). Several studies have revealed that although print materials are still popular within universities, an increasing number of university students use web resources for their research (Lukasiewicz, 2007; Grudzien and Casey, 2008; Kichuk, 2010; Knight, 2013). The emergence of use of web 2.0 tools and their subsequent application in libraries has provided librarians with greater opportunities to improve the efficiency and effectiveness of library services.

Libraries have usually been early and enthusiastic adopters of new information technologies and they have welcomed Web 2.0 with the same zeal (Mahmood and Richardson, 2011). Libraries of all types have embraced Web 2.0 technologies as a method of promoting themselves within the users' community (Dickson and Holley, 2010); to communicate with patrons (Phillips, 2011); to educate library users (Mahmood and Richardson, 2011); and for information dissemination (Jayasuriya and Brillantine, 2007) among other uses. The major Web 2.0 technologies used today for networking by libraries are blogs, Wikis,

RSS (Really Simple Syndication), social tagging services, IM (Instant messaging), and social networking sites (Chu, 2009; Chua and Goh, 2010; Dickson and Holley, 2010).

The technological environment is ever changing and this has transformed the traditional role of academic libraries (Lukasiewicz, 2007). The academic library is expected to serve more and more users with diverse needs in an ever-changing environment. Therefore, academic libraries should be more proactive and creative in offering better services, especially Web 2.0 services (Lukasiewicz, 2007; Johnson and Magusin, 2009). The rationale is that the use of Web 2.0 services is one of the most popular trends nowadays, particularly among students (Mohd, Kiran, and Mohd, 2013). However, successful application of web 2.0 services in libraries should be supported by empirical research (Bell, 2008).

Studies that have been carried out point to the fact in spite of the availability of these tools, their utilisation is still low (Kim and Abbas, 2010; Ram et al., 2011; Tyagi, 2012). Nesta and Mi (2011) argue that, "...lack of user participation in Web 2.0 or Library 2.0 interfaces what we have seen is failure on a massive scale rather than the stunning success that its advocates predicted". Bell (2008) has attributed the failure of these tools to the bandwagon mentality whereby libraries quickly apply technology before carefully analysing their feasibility.

The phenomenon of Web 2.0 use in libraries is beginning to take shape recently in Africa in general and Zimbabwe in particular. The Harare Institute of Technology (HIT) library has an active Facebook page where students can download EBSCO video tutorials. Chinhoyi University of Technology Library uses Facebook for library announcements. The Zimbabwe Open University uses RSS feeds where users can subscribe to receive updates from the library. The National University of Science and Technology has Twitter, Facebook and RSS and applications and YouTube

on their website and library there is a chat facility (Zoho) on the homepage for digital reference services. Bindura University of Science Education Library has Facebook, Twitter, and YouTube. The University of Zimbabwe Library has Skype and Twitter tools for communicating with librarians. Lupane State University Library has an active Facebook page.

However, a cursory glance at the university library websites reveals that the utilisation of these tools is still low. This observation was confirmed by the Information Technology Manager of the NUST Library who suggested that there is a need for awareness programmes on both staff and students to improve the utilisation of the tools. Low utilisation of available web 2.0 tools should be a matter of concern for academic librarians. A lot of time and effort, and resources are used to develop, implement and maintain these services. If academic libraries in Zimbabwe are to reap maximum benefits from these tools, there is need for librarians to carry out studies to determine the reasons why these tools are not popular amongst university students. The evidence is useful for designing more successful library services.

Studies reveal that low utilisation of web 2.0 tools may be attributed to lack of awareness (Ram et al. 2011), lack of skills (Tyagi, 2012) and negative perceptions (Raven and O'Donnell, 2010; Yoo and Huang, 2011). Several studied have been carried out in Zimbabwe on web 2.0 applications in libraries. (Moyo, 2012; Chipangura, 2014; Dodzo, 2014; Nhakura, 2014). However, the issue of knowledge and practices on web 2.0 has been largely overlooked; moreover, the studies tended to focus on social networking tools overlooking other web 2.0 tools which are applicable for library services. This study looked at web 2.0 tools from a broader perspective.

Bradley (2007: 182) argues that "An understanding of these resources, even if they are not currently being used, is necessary in order to keep in touch with and have an understanding of this group

[students]". Bell (2008) argues that, "Not only do we likely fail to conduct an analysis to first determine the feasibility of a new technology application, but we rarely take the time to adequately determine if our users would value the new service". These arguments point to a need for an empirical study which looks at the knowledge, attitudes and practices of university students on these new technologies to inform their application in academic libraries.

1.2 PREVIOUS RESEARCH

This section looks at previous research on the knowledge and attitudes of students on web 2.0, and their adoption in academic libraries. The literature provides a conceptual framework of the study. The literature formed the basis for the Knowledge, Attitudes and Practices (KAP) framework adopted for this study (see Figure 1).
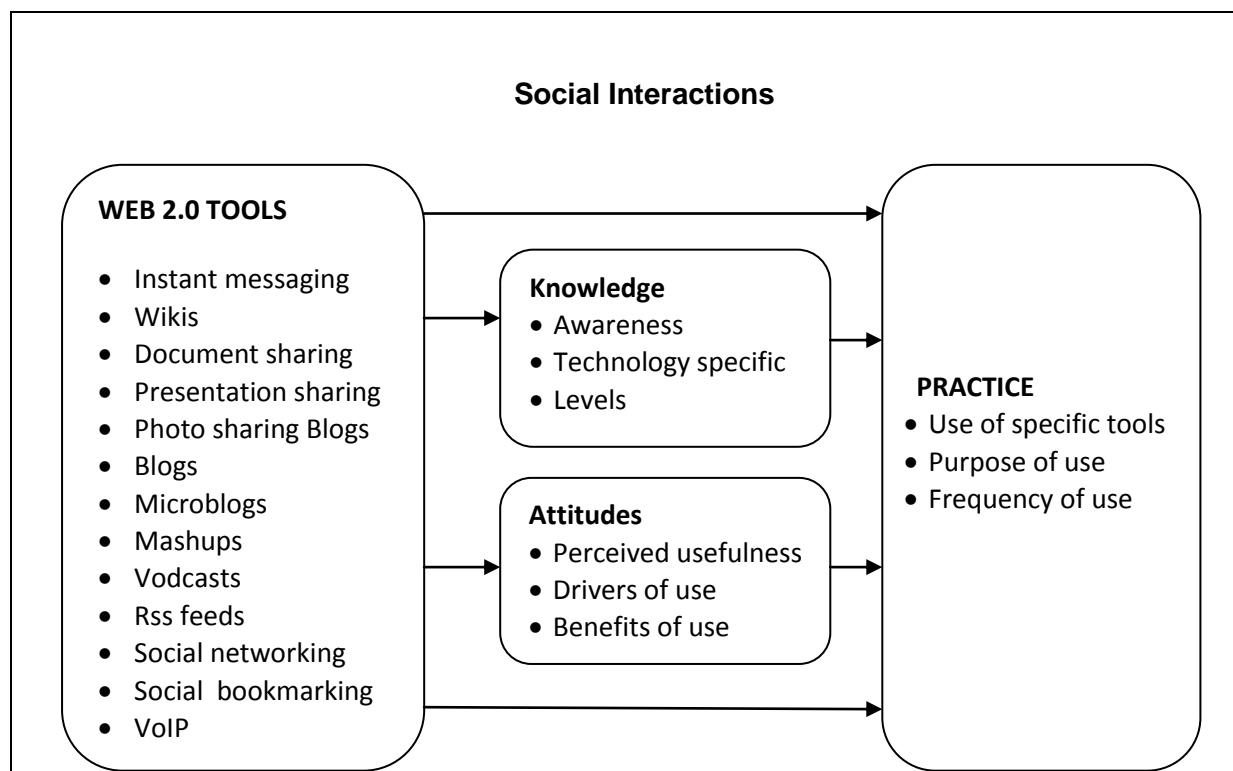

Figure 1: Knowledge, Attitudes and Practice (KAP) model of web 2.0 tools

Studies have revealed that web 2.0 tools are popular with university students due to their flexibility and social nature. The tools have proved to be an advantage over the traditional web tools due to their ubiquitous access, low cost, ease of use, functionality, and flexibility of emerging Web 2.0 technologies have made them much more appealing as information management and learning tools (Chen et al., 2005; Boulos, Maramba, & Wheeler, 2006). Research reveals that there is a significant relationship between social environment and reading habits of

students (Cumaoglu, Sacici, and Torun, 2013).

A study that was carried out by Tyagi (2012) found that the academic communities are quite interested in using web web-based tools in their learning process. A survey of academic libraries in New Jersey, USA and Hong Kong, China by Nesta and Mi (2011) found that instant messaging, blogs, RSS, Facebook, and Twitter were widely used by students. This is in line with the results of a study that was carried out by Baro, Idiodi and Godfrey (2013) in Nigerian University

libraries which revealed that social networking tools such as Facebook and Twitter are common among users. Instant messaging is one of the commonly used web tool for library reference services. The George Washington University Library uses instant messaging, and it has become the preferred reference services method by students (Gaspar & Wilhelm, 2007: 133).

Georgia State University libraries have successfully used blogs by creating subject blogs. The university library uses blogs in conjunction with other reference services. Each blog contains a variety of content, including new subject-specific databases, calls for participation and requests for proposals, subject-related world news and studies, book reviews, conference announcements, and relevant library news (Farkas, 2007: 31).

A New York University librarian used Facebook as an outreach tool in order to introduce herself as a subject specialist and the library's services. The results from this initiative showed that the students responded positively to the posts, with some thanking the librarian for contacting them and some patrons sending friend requests (Lawson, 2007: 148). This is in line with a study that was carried out at Lupane State University which revealed that Facebook was popular among university students and the tool was used for marketing library services.

However, this is not the case with other state libraries in Zimbabwe, for example the NUST library prohibits the usage of Facebook within the library. A similar observation was made by Zanamwe, Rupere and Kufandirimbwa (2013) who found that some universities in Zimbabwe have imposed an outright ban on the use of social networking sites.

It is striking to note that awareness and actual use of these tools by university students for academic purposes still remains low. A study that was carried out by Ram et al. (2011) in India revealed that awareness of web 2.0 tools by students was generally low. A substantial number of students (44.51%) indicated that they never used them in their learning activities. Nesta and Mi (2011) carried out a study in China and found out that students did not recognize the RSS logo or know what RSS was.

A study that was carried out by Nesta and Mi (2011) in the United States of America showed that students' participation in these technologies was low. This trend is consistent with the findings of a study that was later carried out in India by Tyagi (2012) which revealed that the usage of Web 2.0 tools is not very significant amongst university students. Wiki and social networking sites were the most commonly used tools by the respondents. The studies reveal that tools with high degree of educational value such as blog, RSS, social bookmarking and audio or video, etc., are not yet popular among the academic communities.

A study of 230 academic libraries in the USA found that while 73 percent offered RSS feeds only 10.8 percent of students subscribed to RSS feeds. As a result the researcher concluded a mismatch between availability of web 2.0 tools and their utilization (Kim and Abbas, 2010: 215). This observation is supported by Coffman (2012) who argue that "Even a cursory look at some of the more highly regarded Library 2.0-styled websites suggests that this idea may not be going very well". The major obstacles that have caused low utilisation of web 2.0 tools, according to the studies that were carried out include lack of sufficient knowledge and skills (Tyagi, 2012).

Overall, the literature shows that web 2.0 technologies offer a variety of opportunities in academic libraries. Their interactivity, ease of use, functionality, and flexibility has made them powerful tools. Libraries have the opportunity to reap maximum benefits from these tools. However, research shows that there is still a gap on the availability of web 2.0 tools and their utilisation. Reviewed literature highlight that lack of skills, lack of awareness, and improper design and

implementation of web 2.0 based services has resulted in low usage of these tools in academic libraries.

1.3 THEORETICAL FRAMEWORK

Peng, Wang and Kasuganti (2011) stress the point that "Adoption of new technologies takes time and effort, often requiring evaluation, learning, and trial by potential adopters. Much of the information needed to support the adoption of a technology flows through contacts and interactions within a social network".

This study therefore is based on the social embeddedness perspective which focuses attention on the embeddedness of Information Technology innovation in the social context of various organizational settings of developing countries. The approach argues that IT transfer and diffusion perspectives oversimplify IT adoption and are often misleading.

The perspective advances the notion that IT development should be idiosyncratic to particular social settings. IT and innovations which have worked elsewhere not work in a different setup. Miscione (2007) argues that innovations should be locally meaningful, desirable, or controversial, and they should emerge from the local social dynamics.

The social embeddeddness approach is important in developing web 2.0 innovations in libraries due to its recognition of social interrelationships and its acceptance of the user as an important stakeholder in the development and implementation of IT innovations. This study addresses this by focusing on the knowledge, attitudes and practices of library users. An understanding of these variables would assist in the development of more successful user services in academic libraries. Figure 1 illustrates the conceptualisation of the knowledge, attitudes and practices (KAP) model that was developed for the study.

1.4 PROBLEM STATEMENT

Web 2.0 tools provide academic libraries with an opportunity to develop innovative library services and products. Although libraries have begun to tap into the potential of these tools, their utilisation still remains low. This has can be attributed to lack skills and awareness, and probably negative perceptions towards the tools. Successful implementation of these tools in libraries requires careful planning and analysis of their feasibility (Bell, 2008). It is therefore important to determine if library users would value the technologies before implementing them. Understanding the knowledge, attitudes and practises is important for academic libraries in getting maximum benefit of these technologies.

1.5 STUDY OBJECTIVES

The main aim of the study is to assess the knowledge, attitudes and practices of NUST university students on Web 2.0 tools. The specific objectives are:

1.5.1 To establish the knowledge levels of university students on web 2.0 tools.

1.5.2 To determine the attitudes of university students web 2.0 tools.

1.5.3 To find out the adoption and use of web 2.0 tools by university students

1.6 METHODS

The descriptive survey methodology was used for the study. The population consisted of NUST students. From the target population of undergraduate students a sample size was calculated automatically using the Survey System Software. From a population of 4249 students, with a confidence interval of 95% and sampling error of 0.5, a total sample of 352 was calculated. A questionnaire was used to collect data from students. Three hundred and seventy one questionnaires were conveniently distributed to students the campus during the 2013 to 2014 academic year. The response rate was (280) 75%. The instrument was analyzed using simple percentage count table method under

descriptive statistics. Qualitative and qualitative approaches were used to present the data.

1.7 FINDINGS

The findings of the study were analysed under three main variables of the study; that is knowledge levels of university students on web 2.0 tools; attitudes of university students on web 2.0 tools; and adoption and use of web 2.0 tools by university students.

1.7.1 Knowledge of the university students on Web 2.0 tools

One of the main objectives of the study was to determine the knowledge levels of university students on web 2.0 tools.

When asked whether they had ever heard web 2.0 technologies, the majority, that is 200 (71%) of the students indicated that they knew about the technologies while 80 (29%) indicated that they did not know of the technologies. The findings indicate that formal education and the Internet are the major sources of information on web 2.0 technologies.

The respondents were asked about to highlight the specific web 2.0 tools that they are aware of and, Social media, Chat or Instant messaging, Blogs, Wikis and Blogs were the most commonly known technologies whilst Social bookmarking, Mashups, and VoIP or audio sharing and RSS least known. Figure 2 depicts the knowledge of students on specific web 2.0 tools.
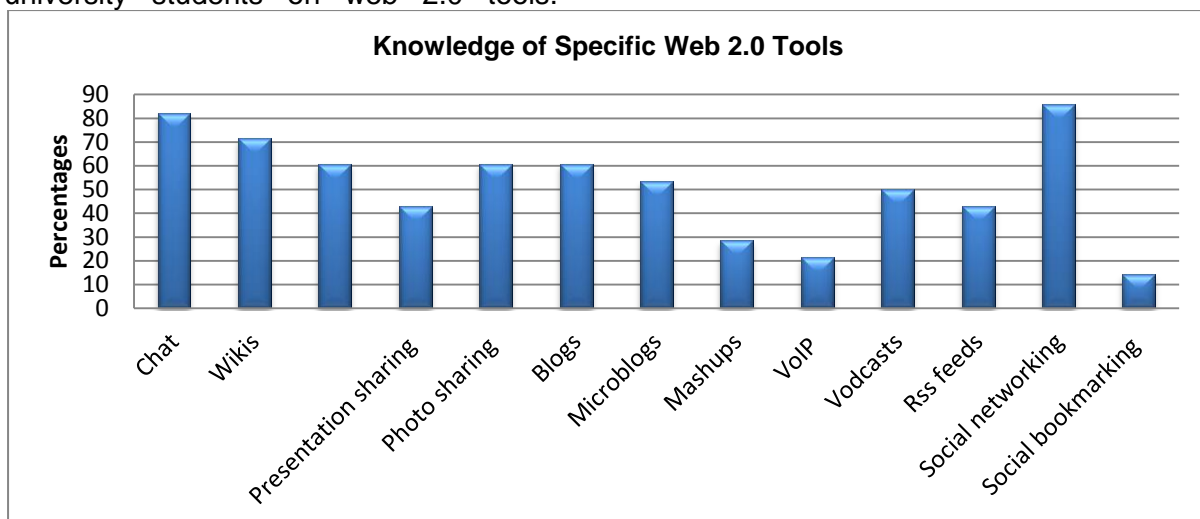

Figure 2: Knowledge of Specific Web 2.0 Tools

The study sought to determine the knowledge levels of students on each web 2.0 tool. The findings reveal that a considerable number of students (46%) indicated that they had 'excellent' skills on Social media tools such as Facebook. The majority (99%) of the students had 'good' to 'excellent' knowledge levels on Instant Messaging. Most of the students indicated that they had 'average' knowledge levels on Wikis, Document sharing tools, Presentation sharing tools, Photo sharing tools, Blogs, Microblogs, Vodcasts.

On the negative a large group of students (64%) indicated that they are not familiar with Social bookmarking tools such as Delicious and CiteUlike. Other least known tools included VoIP (podcast or audio sharing) with 54%indicating that they did not know them. A substantial number of students (54%) also indicated that they are not familiar with Mashups (Google maps, Google reader etc).

1.7.2 Attitudes of university students on Web 2.0 tools

One of the objectives of the study was to determine the attitudes of university students on web 2.0 tools. The findings (see Figure 3) showed that the majority of students (96%) agreed with the notion that web 2.0 technologies are useful in academic libraries whilst only 4% disagreed. Most of the students (54%) strongly believe that web 2.0 tools would improve access to information; overall, the majority (79%) believe the usefulness of

these tools in improving access to information. Eight five percent agreed that they facilitate communication with colleagues, 57% believe they are useful for user education purposes, 65% think they are appropriate for receiving alerts from the library, 47% feel they can use the tools to suggest library materials, while an overwhelming majority (86%) believe that the tools facilitate communication with the librarian.
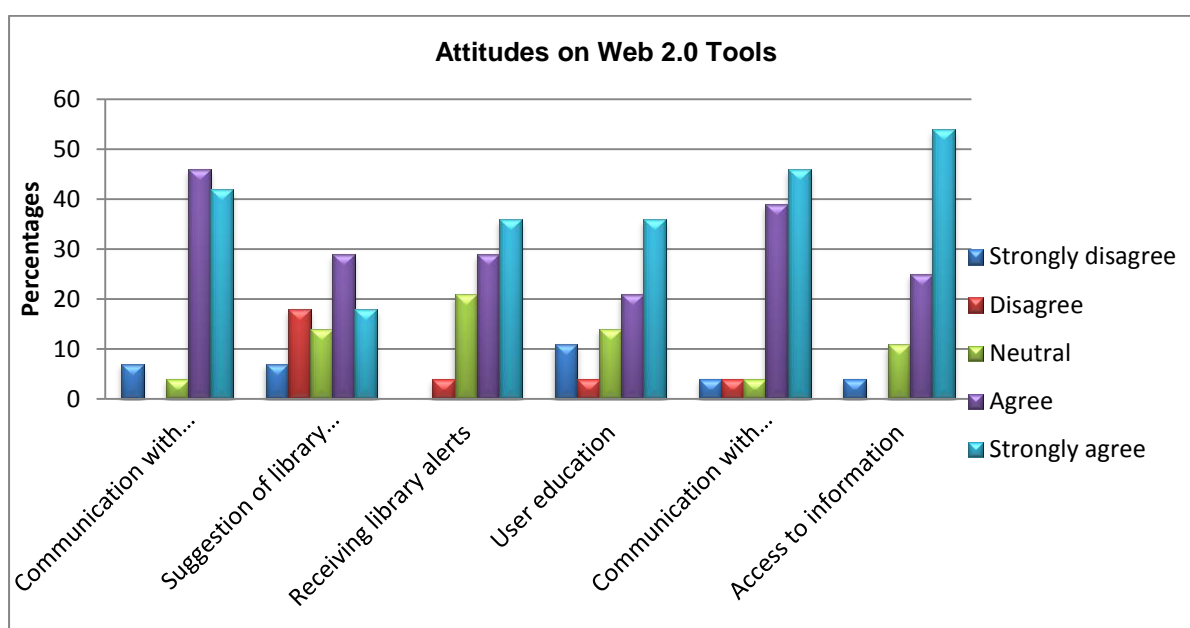

Figure 3: Attitudes on Web 2.0 Tools

The respondents were asked about the major advantages of using web 2.0 for their scholarly work. Most of them believed that the tools improve access to current and relevant knowledge. Other advantages that were cited include their availability, improved communication, flexibility, access, reduction of stress, ease of use, speed, and their low cost. The major disadvantages of web 2.0 tools that were cited include their unreliability, and lack of trustworthiness, lack of internet connectivity, lack of accessibility, and lack of awareness. However, 98% of the respondents indicated that they would use web 2.0 tools to access scholarly information, while only 2% of the

respondents were not sure of the importance of the tools.

The results (see Figure 4) indicate that 50% of the students believe that web 2.0 tools have medium to high accessibility, 18% believed they are highly accessible, while 14% believe they are not accessible. The tools scored high to very high on ease of use and flexibility, and low to medium on trustworthiness. However, it

was interesting to discover that a considerable number (25%) of the students believe that the information gathered from web 2.0 tools is accurate, and 43% believe that the information is of medium quality.
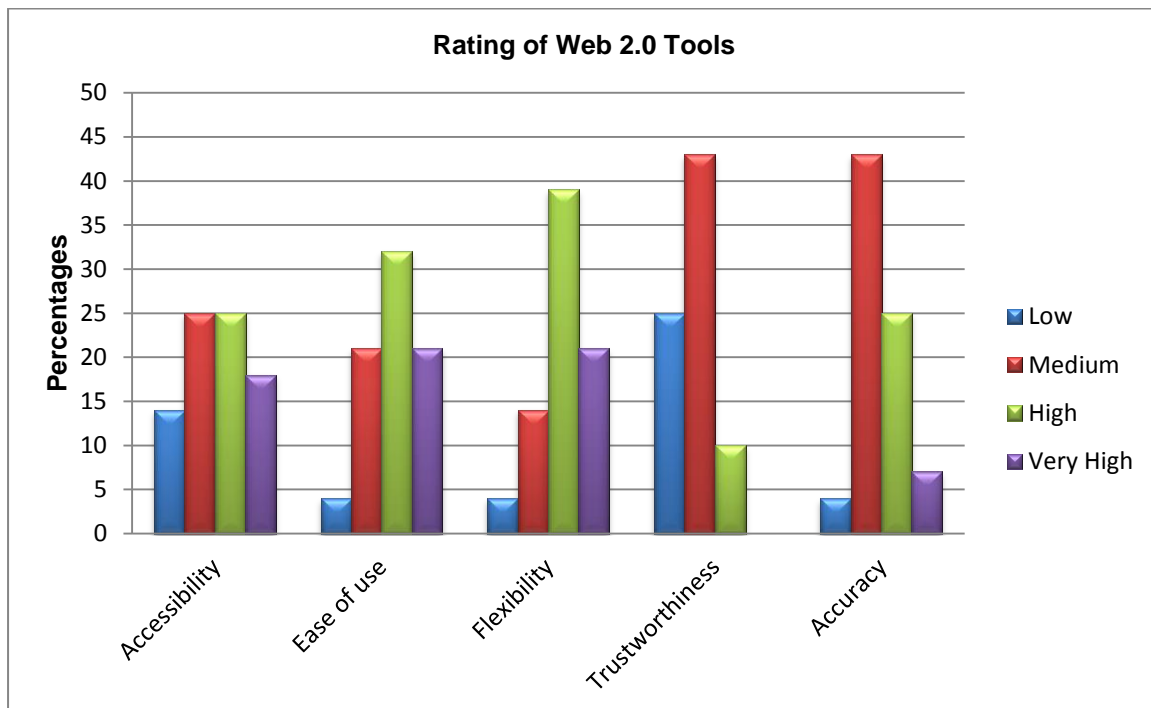
Figure 4: Rating of Web 2.0 Tools

1.7.3 Adoption and use of Web 2.0 tools

The findings reveal that all the students who participated in the study had used at least one of web 2.0 tools. The majority (75%) indicated that they have used the tools when searching for scholarly information, 71% used the tools for communication, 64% used them for sharing files, and 64% for entertainment, and a considerable percentage 46% receives course materials from lecturers using the tools. A small percentage 25% used the tools to receive files from the library, 14% used the tools to communicate with the librarian, and 18% for other purposes. Figure 5 shows the results on the nature of web 2.0 use by students.
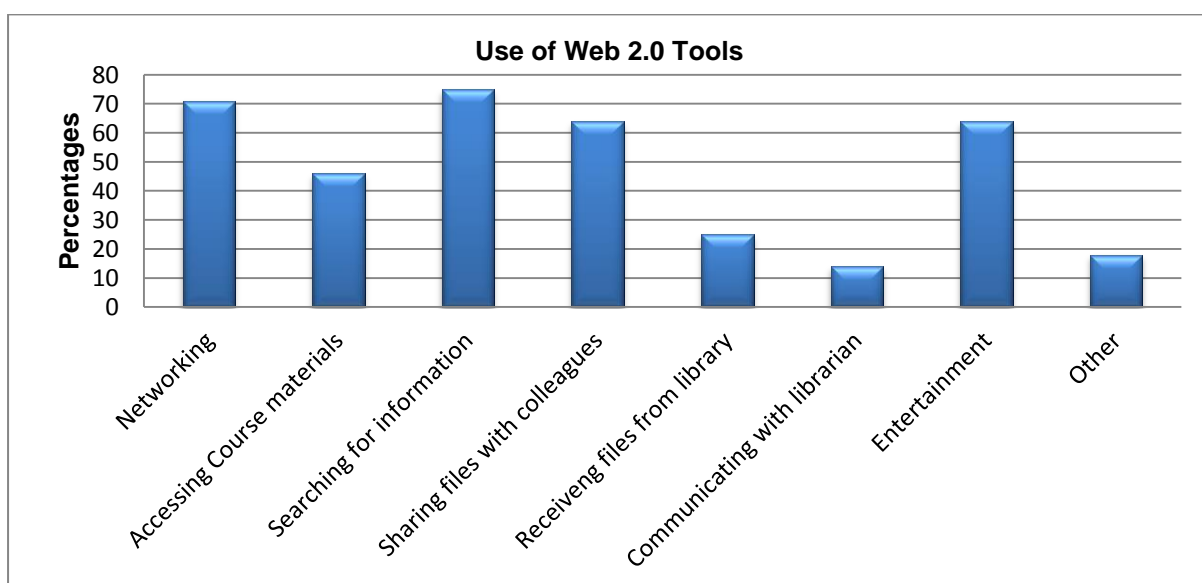
Figure 5: Use of Web 2.0 Tools

The results presented in Figure 6 indicate that the majority of students 71% 'usually' use Instant Messaging or Chat. 64% 'usually' use Social networking tools, while 11% 'sometimes' use Social media tools. A substantial number (50%) of students 'usually' and 'sometimes' used vodcasts. The results show that Chat and Social networking are the most frequently used tools, followed by vodcasts such as YouTube. Moderately used tools include Microblogs, Wikis, Document sharing tools and Presentation sharing tools. The least used tools are Mashups, RSS feeds, Blogs, Photo sharing tools, VoIP, and Social bookmarking tools respectively. It was interesting to note that 46% of the respondents never used Social bookmarking tools, 43% never used RSS feeds, and 39% never used VoIP and Photo sharing tools. However, almost all (98%) of the respondents indicated that they would likely use web 2.0 tools in the event that the library introduces web 2.0 based service.
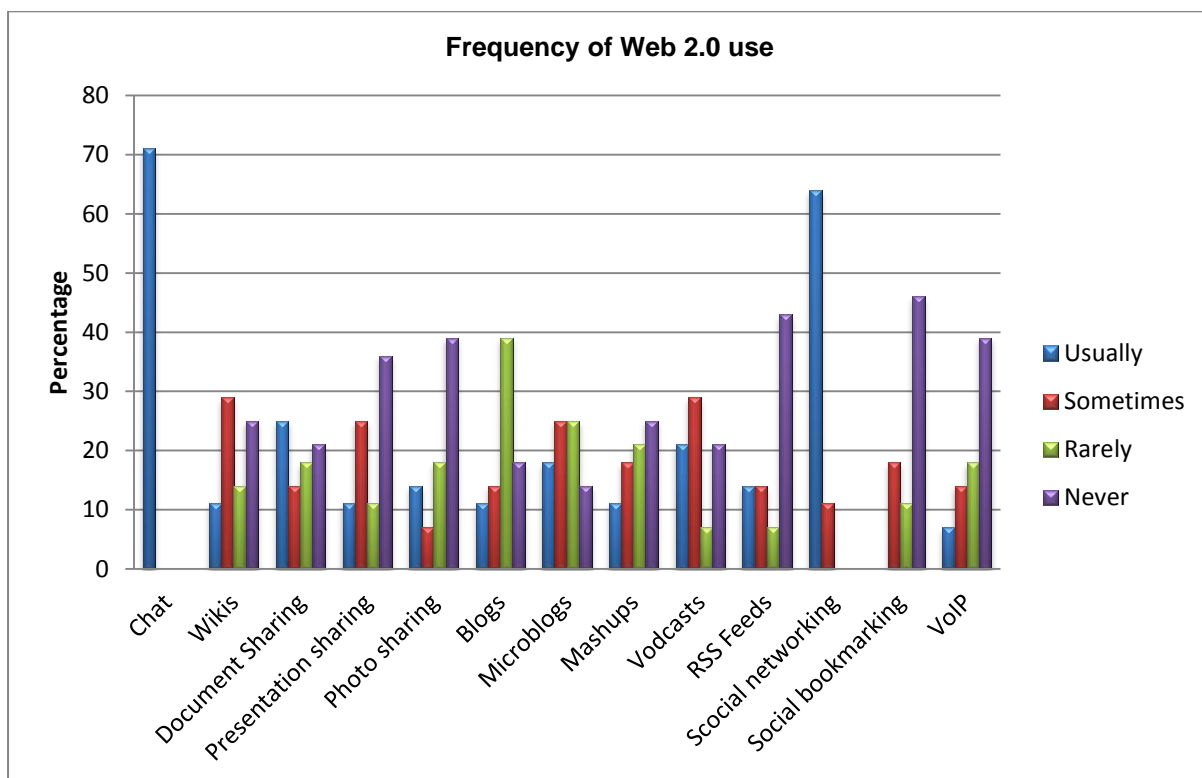

Figure 6: Frequency of Web 2.0 use

1.7.4 CONCLUSIONS

The findings reveal that the majority of students know about web 2.0 technologies. Most of them indicated that they came to know about web 2.0 tools through formal education and the internet. The most commonly known tools are Social networking tools and Instant Messaging Chat. The least known are Social bookmarking, VoIP, Mashups, RSS feeds, and Presentation sharing. The majority of the students indicated that they have 'excellent' skills on Social networking tools and Instant Messaging or Chat. Most of the students indicated that they had 'good' skills on Wikis, Document sharing, and Presentation sharing tools. The students scored 'average' skills on blogs and 'poor' on Microblogs, Mashups, vodcasts, RSS feeds, Social bookmarking

and VoIP. The tools with the poorest scores were Social bookmarking, Mashups and VoIP respectively.

Almost all students had positive attitudes towards web 2.0 tools. They believed that the tools can improve access to scholarly information; improve communication among themselves and with the librarian; can be useful for library instruction and library alerts; and that they can be useful for making suggestions for library materials. The major advantages of the tools that were cited include their availability, improved communication, flexibility, access, reduction of stress, ease of use, speed, and their low cost. The major disadvantages of web 2.0 tools that were cited include their unreliability, and lack of trustworthiness, lack of internet connectivity, lack of accessibility, and lack of awareness and skills to use the tools. It was interesting to note that an overwhelming majority of the students believe that the library can use these tools to provide access to scholarly information.

The least used tools are Mashups, RSS feeds, Blogs, Photo sharing tools, VoIP, and Social bookmarking tools respectively. A substantial number of students never used Social bookmarking tools, RSS feeds, VoIP and Photo sharing tools. The findings reveal that the tools were mainly used when searching for scholarly information, for communication purposes, for sharing files, for entertainment, and when receiving course materials from lecturers. A small percentage used the tools to receive files from the library, or to communicate with the librarian. Almost all of the respondents indicated that they would likely use web 2.0 tools in the event that the library introduces other web 2.0 based services.

1.8 IMPLICATIONS OF THE FINDINGS TO ACADEMIC LIBRARIES

Machiavelli (1992:13) states that; "It must be considered that there is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle,

than to initiate a new order of things". This statement is particularly true for academic libraries which are operating in a constantly changing internal and external environment.

Academic libraries suffer from a wide range of pressures that usually emanate from increases in the client load due to larger student enrolments and changes in clients information needs due to the introduction of new information technologies. An academic library operating in a constantly changing environments need to adjust its products and services so that it can remain relevant within the institution. The emergency of the web 2.0 platform can be seen as an opportunity for improving existing library services and products and for possibly introducing totally new services.

However, web 2.0 tools have brought many challenges for the academic library. These challenges include increased workloads, need for training, the techno-economic imperative, ever changing user needs, information overload, reliability and trustworthiness of web 2.0 based information, low utilisation of services, and greater expectations from library clients. These challenges need to be addressed if the library is to reap maximum benefits from the technological innovations.

The findings of this study may be useful in addressing some of the challenges that are related to the successful design and implementation of web-based services in academic libraries. Generally, students are aware of most of the web 2.0 tools, especially those that they have used for social networking and entertainment. However, a substantial number of then did not know of certain tools such as Social bookmarking, VoIP, Mashups, RSS feeds, and Presentation sharing. These tools have a great potential to be used for academic purposes, for example, Social bookmarking can be used for 'tagging' specific information on a website so that other users and staff could find similar useful resources. RSS feeds can reverse the flow of information whereby relevant information goes directly to the user,

instead of the users wasting precious time searching for information. Academic libraries therefore need to tap into tools with potential academic value.

There is a need to introduce awareness programmes to ensure that the users familiarise themselves with the different tools. Greater awareness of certain tools may improve their utilisation. Training in the use of tools may also benefit library users. The findings reveal that some users did not use the web 2.0 because they lack the knowhow. Regular training programmes in the use of tools such as Social bookmarking, RSS feeds, and VoIP, which are the least used tools, may help improve their awareness and utilisation.

Students displayed a positive attitude towards the use of these tools for accessing and managing scholarly information. This has both positive and negative implications for the academic library. The positive implication is that students are likely to embrace web 2.0 based services if they are well designed and implemented well.

However, one cannot afford to ignore the critical questions on the reliability accuracy and trustworthiness of these information sources. This entails that the academic library should have a responsibility to evaluate and possibly repackage the information before it can be accessed by the student population. This may also all for subject specialists who would be tasked with creating accurate and relevant content for the library users. The fact that some of these tools are already being widely used is a positive trend for academic libraries because they do not have to train most their patrons how to use them. However, there is need for the academic library to teach patrons how to use these tools for educational purposes

A significant number of users indicated that they never used some of the tools such as Social bookmarking tools, RSS feeds, VoIP and Photo sharing tools. If academic libraries are to benefit from

these tools, they need to offer comprehensive training programmes so that users can easily adopt and use them for educational purposes.

It would be absurd to ignore the issue of privacy and accessibility of these tools. Libraries need to come up with policies that address the issue of privacy and confidentiality of information associated with web 2.0 tools. One of the reason that was raised as a challenge that stifles the usage of web 2.0 tools is the issue of accessibility. Most university students do not have internet access at their homes and they rely heavily on campus and library connections. Although a significant number of students have mobile technologies that can be used to access the internet, the mobile rates for internet access are still prohibitive for most students.

In cases where students can access the internet, it is difficult o use some of the tools due to low bandwidths and slow internet connections. Therefore, the library needs to address the network infrastructural issues before introducing certain services which are demanding in terms of bandwidth.

McManus (2009) argues that with web 2.0 technologies, academic libraries can make change a very easy and consistent activity; however, this can only be achieved if the change is properly managed. Some of the strategies that can work for academic libraries include bold leadership, user involvement, careful planning and having a clear vision.

These findings have both theoretical as well as practical implications for academicians, learners and policy makers in the universities. Successful application of web 2.0 tools for innovative library services calls for careful planning and analysis of the internal and external environment. Gathering feedback from library clientele on technological tools is critical for the development of successful, user-centred services in academic libraries.

REFERENCES

Baro, E. E., Idiodi, E.O.and Godfrey, V.Z. (2013). Awareness and use of Web 2.0 tools by librarians in university libraries in Nigeria. *OCLC Systems & Services.* 29(3),170 – 188.[Online] Available from: http://www.emeraldinsight.com/journals.htm?articleid=17090777 [accessed: 22March 2014].

Bell, S. (2008). Design thinking. *American Libraries.* 39(1/2),44-9.

Benkler, Y. (2006). *The wealth of networks: how social production transforms markets and freedom.* Yale University Press.

Boulos, M., Maramba, I. and Wheeler, S. (2006). Wikis, blogs and podcasts: a new generation of web-based tools for virtual collaborative clinical practice and education. *Journal of the American Dietetic Association.* 107(4),553−555.

Bradley, P. (2007). *How to Use Web 2.0 in Your Library.* London: Facet Publishing.

Chen, H. L., Cannon, D., Gabrio, J., Leifer, L. T. G. and Bailey, T. (2005). Using wikis and weblogs to support reflective learning in an introductory engineering design course. *Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Portland, OR.*

Chipangura, M. (2014). Awareness and use of web 2.0 tools in libraries. A case of the BritishCouncil Library in Harare. Msc Dissertation. National University of Science and Technology.

Chu, S. K. (2009). Using Wikis in academic libraries. *The Journal of Academic Librarianship.* 35(2), 170-176.

Chua, A. Y. and Goh, D. H. (2011). A study of Web 2.0 application in library websites. *Library& Information Science Research.* 32(1), 203-211.

Coffman,S. (2012). The decline and fall of the library empire. [Online] Available from: *http://www.infotoday.com/searcher/apr12/Coffman--The-Decline-and-Fall-of-the-Library-Empire.shtml*[accessed: 16 April 2014].

Cumaoglu, G., Sacici, E. and Torun. K. (2013). E-Book versus Printed Materials: Preferences of University Students. Contemporary Educational Technology. 4(2):121-135. [Online] Available from: http://www.cedtech.net/articles/42/423.pdf [accessed: 16 March 2014].

Danyaro et.al. (2010). An Evaluation of the usage of web 2.0 among tertiary level students in Malaysia*. Information Technology* (ITSim), 1, 1-6.

Dickson, A. and Holley, R. P. (2010). Social networking in academic libraries: the possibilities and the concerns. *New Library World.* 111(11/12), 468-479.

Dodzo, T. (2014). Perceptions and usage of social networking tools by Lupane State University Library. Bsc Dissertation. National University of Science and Technology.

Farkas, M. (2007). *Social Software in Libraries: Building Collaboration, Communication, and Community Online.* Medford, N.J: Information Today.

Ganzaroli, A. (2002). Creating trust between local and global systems. (Erasmus Research Institute of Management, Erasmus University Rotterdam, Rotterdam).

Gaspar, D. and Wilhelm, S.P. (2007). Implementing IM @ Reference: The

GW Experience. In L. Cohen (Ed.), *Library 2.0: Initiatives in Academic Libraries* (133-144). Chicago: Association of College and Research Libraries.

Grudzien, P. and Casey, A.M. (2008). Do off-   campus students use e-books? *Journal of Library Administration.* 48(3/4), 455-466.

Jayasuriya, H.K. and Brillantine, F. (2007). Student services in the 21st century: evolution and innovation in discovering student needs, teaching information literacy, and designing Library 2.0-based services. *Legal Reference Services Quarterly.* 26(1),135-70.

Johnson, K.and Magusin, E. (2009). *Exploring the digital library: a guide for online teaching and learning.* San Francisco, CA: John Wiley.

Kichuk, D. (2010). Electronic collection growth: an academic library case study. *Collection Building.* 29(2), 55-64.

Kim, Y. and Abbas, J. (2010). Adoption of Library 2.0 functionalities by academic libraries and users: a knowledge management perspective. *The Journal of Academic Librarianship.* 36(3).

Knight, N. (2013). Enhancing access to library resources at Northern Caribbean University through an e-library initiative. *Electronic Library.* 31(6),753 – 769

Lawson, D. (2007). Taking the Library to Users: Experimenting with Facebook as an Outreach Tool. In L. Cohen (Ed.), *Library 2.0: Initiatives in Academic Libraries* (145-155). Chicago: Association of College and Research Libraries.

Liu, S. (2008). Engaging users: the future of academic library web sites.

College & Research Libraries. 69 (1), 6-27.

Lukasiewicz, A. (2007). Exploring the role of digital academic libraries: changing student needs demand innovative service approach. *Library Review.* 56(9), 821-827.

Machiavelli, N. (1992). *The Prince.* New York: Dover Publications.

Mahmood, K. and Richardson, J. (2011). Adoption of Web 2.0 in US academic libraries: a survey of ARL library websites. *Program: electronic library and information systems.* 45(4), 365 – 375. [Online] Available from: http://www.emeraldinsight.com/journals.htm?articleid=1953766 [accessed: 16 March 2014].

McManus, B. (2009). The implications of Web 2.0 for academic libraries. *Electronic Journal of Academic and Special Librarianship.* 10(3).[Online] Available from: http://southernlibrarianship.icaap.org/content/v10n03/mcmanus_b01.html [accessed: 24 January 2014].

Miscione, G. (2007). Telemedicine in the Upper Amazon: Interplay with local health care practices. *MIS Quarterly.* 31(2), 403–425.

Mohd, I A., Kiran, K. and Mohd, A M S. (2013). Awareness of Using Library Web 2.0 Services Among Malaysian Youth. *Proceedings of the 5th International Conference on Asia-Pacific Library and Information Education and Practice. 10-12 July 2013.* [Online] Available from: http://www.vub.ac.be/BIBLIO/nieuwenhuysen/presentations/2013-07-aliep--khon-kaen/ALIEP2013_eProceeding.pdf [accessed: 24 January 2014].

Moyo M.S. (2012). Adoption and use of social networks for library services at Africa University. Msc Dissertation. National University of Science and Technology.

Nesta, F. and Mi, J. (2011). Library 2.0 or library III: returning to leadership. *Library Management.* 32(1/2), 85-97.

Nhakura, M.(2014). Social media as a tool for sharing academic knowledge among undergraduate students at HIT university. Msc Dissertation. National University of Science and Technology.

O'Reilly, T. (2005).What is Web 2.0 design patterns and business models for the next generation of software. [Online] Available from: http://oreilly.com/web2/archive/what-is-web-20.html[accessed: 16 March 2014].

Peng, G., Wang, Y. and Kasuganti, R. (2011). Technological embeddedness and household computer adoption. *Information Technology & People.* 4(4), 414- 436 [Online] Available from: http://www.emeraldinsight.com/journals.htm?articleid=17003223 *[*accessed: 13 March 2014].

Phillips, N.K. (2011). Academic library use of Facebook: building relationships with students. *The Journal of Academic Librarianship.* 37(6), 512-522. [Online] Available from: http://www.sciencedirect.com/science/article/pii/S0099133311001625 *[*accessed: 23 March 2014].

Ram, S., John, Paul., Anbu, S.P. andAnjay. K. S. (2011). Responding to user's expectation in the library: innovative Web 2.0 applications at JUIT Library: A case study", *Program: electronic library and information systems.*45(4): 452 – 469[Online] Available from: http://www.emeraldinsight.com/journals.htm?articleid=1953845[accessed: 24 January 2014].

Raven, J. and O'Donnell, K. (2010). Using Web 2.0 technology for work experience: student perspectives on Tawasul. *Learning and Teaching in Higher Education: Gulf Perspectives.* 7(1), 1-18. [Online] Available from: http://lthe.zu.ac.ae/index.php/lthehome/article/download/20/3. [accessed: 24 January 2014].

Shrager, D.E. (2010). Moving past Web 2.0h! An exploratory study of academic law libraries. [Online] Available from: http://works.bepress.com/aallcallforpapers/66 [accessed: 11 March 2014].

Tyagi,S. (2012). Adoption of Web 2.0 technology in higher education: A case study of universities in National Capital Region, India. *International Journal of Education and Development using Information and Communication Technology* (IJEDICT). 8(2), 28-43.

Xu, C., Ouyang, F. and Chu, H. (2009). The academic library meets Web 2.0: applications and implications. *The Journal of Academic Librarianship.* 35(4), 324-31.

Yoo, S. J. and Huang, W.-H. D. (2011). Comparison of web 2.0 technology acceptance level based on cultural differences. *Educational Technology & Society.*14(4), 241–252.

Zanamwe, N., Rupere, T. and Kufandirimbwa, O. (2013). Use of Social Networking Technologies in Higher Education in Zimbabwe: A learners' perspective. [Online] Available from: http://www.ijcit.com/archives/volume2/issue1/Paper020102.pdf [accessed: 11 March 2014].

Zickuhr, K. and Rainie, L. (2014). E-reading rises as device ownership jumps. [Online] Available from: http://www.pewinternet.org/2014/01/16/e-reading-rises-as-device-ownership-jumps/ [accessed: 24 January 2014].

Zickuhr, K., Rainie, L. and Purcell, K. (2013). Library services in the digital age. [Online] Available from: http://libraries.pewinternet.org/2013/01/22/library-services/ [accessed: 24 January 2014].