August 2015

WEB 2.0 TECHNOLOGIES APPLICATION IN TEACHING AND LEARNING BY MAKERERE UNIVERSITY ACADEMIC STAFF

Constant Okello-Obura
Makerere University, Kampala Uganda, obura2007@gmail.com

Francis Ssekitto
Makerere University, francisssekitto@gmail.com

WEB 2.0 TECHNOLOGIES APPLICATION IN TEACHING AND LEARNING BY MAKERERE UNIVERSITY ACADEMIC STAFF

1.Background

According to Thomas and Thomas (2012), over the last three decades rapid growth and development has occurred in the area of information and communication technologies (ICT). Particularly in the last decade, the growth in prominence of social media and Web 2.0 technologies has had a dramatic impact globally on how people communicate (Thomas and Thomas, 2012). Social media platforms such as Facebook, Twitter, Linkedin, Google+ and Renren have the potential to become important disruptive technologies (Christensen 1997; Mutula, 2013) for building cutting-edge models of management education. Fleck (2007) however notes that to date applications of ICT have stimulated developments in e-learning more as support mechanisms than disruptive technologies.

These learning enhancements have typically involved Microsoft Office tools (e.g. Power Point), e-mail and more innovative applications such as online interactive web chats, specific interest forums, streaming video, electronic conferencing and Voice-Over-Internet-Protocol systems, e.g. Skype and "blended learning" programmes (Hawawini 2005). Essentially, these technologies have encouraged a more flexible learning approach to take place across various "touch points", i.e. the classroom, off campus, within the workplace and virtually anywhere with internet access. This distance "blended" learning approach initially occurred within the fields of executive education and lifelong learning within faculties. Globally, many academicians are embracing the utilization of web 2.0 technologies in teaching and learning. The rapid penetration and use of these technology platforms is also being driven by the rise of affordable handsets (Mutula, 2013). However, with the erratic power supply; poor internet connectivity, poor ICT infrastructure etc in African Countries, it difficult to know whether academia have adopted the utilization of web 2.0 technologies in teaching and learning. It is against this background and doubts that this study was instituted to establish the utilization of web 2.0 technologies in teaching and learning at Makerere University.

1.1 Problem Statement

Makerere University is the oldest and premier University in Uganda. In the recent webometrics ranking (August, 2013), Makerere was ranked 4th in Africa by August 2013

(Cybernetics Lab, 2013). Makerere University is an institution in a continuous state of transformation. According to Tusubira (2007), one of the adopted strategies in this transformation is the integration of ICT in all the university academic and administrative functions. The planning phase of this project started during the early part of 2000 and up to now there is remarkable adoption to the utilization of ICT in Makerere University with 24 hours and seven days access to Internet services. There is a fully established Directorate of ICT in the university that supports the University functions by ensuring that there is full-time Internet services. With the availability of these services, one would expect academic staff to adopt the use of web 2.0 technologies in teaching and learning given that the current generation of students is the *IT savvy* generation. Unfortunately, through interaction with many staff and students, we realized that some staff members were not utilizing web 2.0 technologies in teaching and learning in the University. According to Makerere University Annual Report (2013), there is a steady improvement in the use of e-learning platform. Unfortunately, this report makes no mention at all of any adoption of web 2.0 technologies in teaching and learning in the University. This therefore prompted us to make a University wide investigation into the utilization of the web 2.0 technologies in teaching and learning with the guidance of the following objectives:

i. Determine the awareness and use of web 2.0 technologies for teaching and learning in the university
ii. Establish the opinion of academic staff towards web 2.0 technologies for teaching and learning
iii. Determine the factors that hinder the utilization of web 2.0 technologies by academic staff in teaching and learning at Makerere university
iv. Propose strategies to promote application of web 2.0 technologies

2. Literature Review

Grange (2011:3) ably notes the challenge of the learning environment today by observing that "The widespread acceptance of online education has fundamentally transformed our perception of what is and how it should be acquired. It has changed the psychology of learning". New learners want an education so focused that it is almost vocational. They want to learn by doing, or at least experimenting in parallel with their reading and lectures (Grange 2011). To accommodate them, schools will need

to institute major changes at faculty level, the curriculum design level and the classroom teaching level. Schools may need a long period of anticipation to install these new learning principles, but they need to understand them now" (Grange 2011).

Thomas and Thomas (2012) argue that the beauty of new social and digital technologies is their immediacy, reach and flexibility. Alongside traditional teaching techniques, social media can be continually developed around any topic and incorporate current academic events in the learning process as the events themselves unfold during the academic period. Discussion could be guided initially by a staff, but be managed by students and monitored and supported by the institution itself. This sort of teaching could promote the department/ university/ school globally online as a forward-thinking online and innovative institution (Thomas and Thomas, 2012). However, the utilization and forward thinking in the adoption of web 2.0 technologies squarely lies in the awareness and the knowledge of the intrinsic values academic staff attach to their utilization. If you are not aware of something, there is no way you can even develop interest in their utilization. The awareness and attitude towards something are intertwined. Davis (2005) supports this when he reasons that "Web 2.0 is an attitude, not a technology". That is why it was prudent to find out whether Makerere University staff are actually aware of some of the web 2.0 technologies that they can use in teaching and learning. This was established and reported in section 4. However, the understanding of what constitute web 2.0 and use in higher education is critical. The review below addresses this.

3.1 What is Web 2.0?

The internet has revolutionized the concept of information and its use, access and management. Ten years ago, finding information was a lengthy, convoluted process (Hicks and Graber 2010). Today, not only do individuals and computers produce thousands of gigabytes of information a minute, but this information is also networked collectively, which further increases the amount of information produced (Wesch 2008). A very large proportion of human knowledge can thus be accessed within seconds by anyone and through a variety of devices. And, as information grows and becomes more accessible, the concept of knowledge shifts too. Unlike Web 1.0, which was akin to a source or means of communicating information, Web 2.0 provides a way to create information, and consequently knowledge. Web 2.0 is an emergent key driver changing learning paradigms at academic institutions. According to Tyagi (2012), besides technology, Web 2.0 challenges intellectual property and transform consumers into active users creating and curating knowledge. The use of Web 2.0 tools (wiki's, blogs, RSS feed, social networks, podcast etc.) can support innovative teaching methods and is

associated with concepts like communities of practice, syndicated content, learning as a creative activity, peer-to-peer learning, creation of personal learning environments, and non-formal education (Tyagi 2012).

We are enveloped in a "cloud of ubiquitous digital information where knowledge is made, not found and authority is continuously negotiated through discussion and participation" (Wesch 2008). Web 2.0 tools give power to the user/learner. Web 2.0 applications rely on user-generated content and interactivity (O'Reilly 2005). This means that students have control over the content and over the choices that they make in relation to what is preserved and what is discarded (Jordan 2012). Students can upload videos in the target language or make blog posts in the target language and the end product is very much theirs. Rather than just passively using the web to source information, Web 2.0 users are able to run rich internet applications in their browsers (Wesch 2008; Jordan 2012). Newstead (2007) asserts that web 2.0 applications, such as blogs, wikis and aggregators, have a participative element, which encourages users to add, edit or simply rehash content (mashups). These opinions are shared by Greenhow, Robelia and Hughes (2009) who note, "Knowledge is decentralized, accessible and co-constructed among a broad base of users".

Web 2.0 allows learners to participate in this cloud, through five main characteristics, collaboration, creativity, conversation, community and control (Hicks and Graber 2010). It is a read and write web where "users are as important as the content they upload and share with others" (Cormode and Krisnamurthy 2008). The participatory and open nature of Web 2.0 gives us the capability to collaborate with new knowledge and to create empowering connections and community between people. It allows us to creatively use and reuse material in novel ways because there is not one centralized power controlling the web. Finally, and most importantly, Web 2.0 changes us from passive to active information consumers, allowing our online voice to be part of the conversation. The way we produce, store and consume information has changed, and we need Web 2.0 in order to interact with and to direct the future of scholarship and learning (Hicks and Graber 2010).

2.2 Web 2.0 and higher education: changing approaches to learning and teaching

According to Tyagi (2012), the potential of Web 2.0 technologies in teaching and learning environments has caught the attention of universities around the world. Web 2.0 trends in distance education, globalization, digital literacy skills, and collective intelligence are now driving the restructuring of academic programs (Mutula 2013). However, according to Hicks and Graber (2010), the implementation of Web 2.0

technologies in academic contexts raises questions about the mismatch of the existing traditional learning paradigm with the new pedagogies inherent in Web 2.0 tools. Until recently, higher education embraced a teaching model based on traditional conceptions of learning. This traditional learning paradigm focused on how the environment, which included teachers' actions, led to the desired response in students consisting of observable changes of behavior that were maintained over time (Shuell 1986). For example, a well structured lecture led to students "learning" the material as demonstrated by the correct responses in an exam. Internal variables unique to the learner such as prior knowledge, engagement, and motivation were not part of this traditional learning model and learning. Cognitive psychologists, however, began to question this learning model in the 1960s and 1970s, shifting their focus from the environment and the products of learning to the processes of learning. Learning became "active, constructive, cumulative, and goal oriented" (Shuell 1986). Learning was no longer just an observable change in behavior. Learning models now included a series of complex internal processes involving "invisible" changes in cognition and meaning that resulted in observable behaviors (Hicks and Graber 2010). Students' prior knowledge, motivation, and meta-cognition became the focus as control of learning shifted from the instructor to a shared process involving both the instructor and student. In addition learning was not seen as an individual act but a process that is socially situated in learning communities, which engage in conversation and collaborative work.

As noted by Tyagi (2012), the use of Web 2.0 tools provides the ability to incorporate personalized, scalable and customizable systems. A teacher equipped for a knowledge economy needs to be equipped to deal with ambiguity, needs to be adaptable, highly mobile, entrepreneurial and creative (Tyagi 2012). Any educational practice that concerns the playful, expressive, reflective or exploratory aspects of knowledge building is likely to find Web 2.0 tools and services a powerful resource (Rice 2011; Mutula 2013).

Nonetheless, although learning is now acknowledged as a complex cognitive process, traditional learning models still provide the framework for much instructional and web design in higher education classrooms and libraries (Hicks and Graber 2010).

The evolution of Web 2.0 is one example of a shift that created many opportunities for constructivist learning. Increased accessibility to information and subsequent changes in the use and creation of knowledge have changed the way we communicate and interact hence the need for lecturers to adjust and adopt it use. With Web 2.0, the emphasis is on "participating, doing and experiencing rather than knowing what or

where" (McLoughlin and Lee 2008), a constructivist approach. The importance of social interaction and context in teaching is critical in today's learning environment.

If Web 2.0 creates a different learning and information reality then reflective and collaborative dialogue and research in higher education is needed to explore how we design instruction and web tools based on a different model of knowledge creation and learning. Articles about Web 2.0 tools and its application can be found throughout higher education in both academic classroom and library contexts (Cohen 2007; Luo 2010; Williams and Chinn 2009). However, Web 2.0 tools and applications such as blogs, wikis, and use of social networking sites are often implemented in higher education based on the argument that students, as digital natives, use these tools in their everyday life (Hicks and Graber 2010). Web 2.0, however, has larger implications that go beyond specific tools and applications. The accessibility of these tools that encourage creativity, knowledge creation, conversation, and collaboration has created a student population with very different expectations about the control of their learning process and knowledge creation.

It is essential that pedagogy conform to these different approaches to teaching and learning in order to take advantage of the potential of digital media and Web 2.0 applications. Changing student realities means that pedagogy needs to adjust to student web habits to maintain the wide variety of contexts in which students accomplish formal, informal and non-formal learning.

2.3 Issues affecting the utilization of web 2.0 technologies in Teaching and Learning

According to Tyagi (2012), Web 2.0 tools are still in its infancy in terms of its use in education due to a range of factors, which are principally technical, institutional and social. A study conducted by Munuatosha, Muyinda and Lubega (2011) established that the factors that hinder the adoption of new learning media include:

- *Security and privacy in social networked learning*- Prensky (2010) in support of this argument notes that issues of ownership and control will become more complicated as content is increasingly freely shared and being re-used worldwide. However, it should be noted that although learning can be done in a digital environment, there is still room for institutions to filter and apply security measures against both incoming and outgoing content (Munuatosha, Muyinda and Lubega 2011). It is time for organizations to re-define security boundaries as work of all kinds is increasingly being done over the Internet through openness, sharing and free access (Prensky 2010).

- *Technical support and infrastructure-* Lack of reliable power supply and internet connection, and limited supply of computers are considered major infrastructure constraints in the adoption of web 2.0 technologies (Munuatosha, Muyinda and Lubega 2011). Lack of competent technical staff, poor communication among technical personnel and users, irrelevant ICT policies, lack of exposure and irregular professional training for technical staff are the technical support related challenges for adopting new learning media today (Munuatosha, Muyinda and Lubega 2011). Ease of use of any system is mainly facilitated by having reliable technical support and infrastructure (Khan 2001).
- *Administrative support-* According to Munuatosha, Muyinda and Lubega (2011) in their study, they found out that for instance, most executives of higher learning institutions in Tanzania were technophobic towards application of information technology in their day-to-day activities. Out of the 70 executives interviewed, only 35 per cent were comfortable with the use of ICT enabled facilities in their offices (Munuatosha, Muyinda and Lubega 2011). This could be a similar situation in most African University and has a detrimental effect on the planning and policy development of web 2.0 technology adoption and utilization. This is also in line with Khan (2001) who asserts that e-learning development should link back into the institution's mission, and that institutions must have strategies that are enterprise-wide in scope. Once this is achieved, executives should be able to see the value of new learning media adoption in their faculties (Munuatosha, Muyinda and Lubega, 2011).

On the other hand Chokri (2012) note that the expertise of learners in ICTs for learning is a significant factor in the use of web 2.0 technologies. The design of the electronic learning process adopted by online teachers that is the the structure adopted for the learning process, cognitive Flexibility provided by the learning process, visual and design of electronic learning process, hypermedia and hypertext for the electronic learning process is another factor of concern (Chokri 2012). This implies that there is need by an in-built system to attune the efforts of learners to have a high expertise in educative information and communication technologies and the adoption of e-learning system through the ease of use of the features of the e-learning platform.

In a study conducted in India by Tyagi (2012) it was established that the application of the Web 2.0 tools in Indian higher education is still marginal and will have to overcome a lot of obstacles in order to hold its ground as in higher education of developed countries. The adoption of Web 2.0 tools at universities is associated with important challenges (potential risks, institutional fears), hence the need for an effective strategy to deal with implementation problems that may include learning from (others')

experience, as well as open access to content and reliance on open platforms for knowledge sharing and creation (Tyagi 2012).

Although social media has a great potential as a delivery conduit for Massive Online Open Courses (MOOC) or Massive Online Crash Courses (MOCC) that are increasingly being offered by many leading universities especially in North America and Europe, the lack of real-world interactions between professors and students remains a credibility matter (Maslen 2012). For instance, "how does one engage in a class of thousands of students?" (Mutula 2013). The same questions are not any different in Africa and Uganda in particular.

3. Methodology

The study was largely quantitative in nature in which structured questionnaire with few unstructured questions was used to elicit the data. The questionnaire was first pretested on five (5) members of staff in the College of Computing and Information Sciences before full scale data collection could commence. The study also involved the review of literature to gain insight into the adoption of Web 2.0 tools in higher education.

A research assistant with Degree in Library and Information Science was employed to collect the data. The respondents were divided into Colleges and 10 respondents from each College were expected to participate in the study. The respondents were randomly selected to participate in the study. Data collected were analysed using Excel program and the results are reported in Section 4 and discussed in Section 5.

4. Results.

4.1 Response Rate and Background Information

Out of the 100 respondents targeted, 68 responded giving a response rate of 68%. Details of the response are given in Table 1.

Table 1: Response to the Study

Colleges/Schools	Targeted Respondents	Response	% Response
College of Engineering Design. Art and Technology (CEDAT)	10	5	50%
College of Computing and Information Sciences (CoCIS)	10	7	70%
College of Humanities and Social Sciences (CHUSS)	10	5	50%
College of Veterinary Medicine, Animal Resources & Bio-security (CoVAMS)	10	5	50%
College of Business and Management Sciences (CoBAMS)	10	6	60%
College of Natural Sciences (CONAS)	10	10	100%
College of Health Sciences (CHS)	10	6	60%
College of Agricultural and Environmental Sciences (CoAES)	10	10	100%
College of Education and External Studies (CoEES)	10	5	50%
School of Law	10	9	90%
TOTAL	**100**	**68**	**68%**

(Source: Field data)

CoAES, CoNAS and CoCIS had a high response rate to the study with 100%, 100% and 70% respectively. The response rate of 68% is generally good given that the study was conducted during the period lecturers were busy with marking of the exams scripts. When the respondents were asked to specify their area of specialization, the responses were as in Table 2.

Table 2: Responses on the areas of Specialisation

N=68

Areas of specialization	Response
Computer Science, Information and General Works	8
Philosophy and psychology	6

Religion	1
Social Sciences	8
Languages	3
Science (including Mathematics)	21
Technology and applied sciences	8
Arts and Recreation	1
Literature	1
History and Geography	4

(Source: Field data)

Of the total respondents who responded to the question, the majority are in the area of Science (including mathematics) with few in religion, literature, Arts and Recreation. The age brackets of the total respondents (68), were distributed as follow: 29% fall in the age bracket of 21 -30; 34% fall in 31- 40; 21% fall in 42-50; 12% fall in 51- 60 and 61 and above were 4%.

When the respondents were asked as to whether they have ever used web 2.0 technologies only 38 responded. Of the 38, 37 responded in affirmative and only 1 said has never used web 2.0 technologies.

4.2 Awareness and Use of Web 2.0 technologies for teaching and learning in the University

When the respondents were asked to state the web 2.0 technologies that they were aware of their usage before this research, the responses were as below:

Table 3: Responses on the awareness of Web 2.0 Technologies (N= 68)

Web 2.0 technologies types	**Yes**
Face-book- is a free-to-access social networking website. Thus, it is a user-friendly, informal way of interaction among users	66
YouTube- Founded in February 2005, YouTube allows billions of people to discover, watch and share originally-created videos. YouTube provides a forum for people to connect, inform, and inspire others across the globe and acts as a distribution platform for original content creators and advertisers large and small	60
Twitter- is an online social networking service and microblogging service that enables its users to send and read text-based messages of up to 140 characters, known as "**tweets**".	46
E-mail- Electronic mail, also known as **email** or **e-mail,** is a method of exchanging digital messages from an author to one or more recipients	65
Wikis- These are similar to blogs but allow the text on the website to be edited by others, with the creation of a common document that can be shared between	38

individuals. Examples include Wikipedia (www.wikipedia.org) and PB wiki (www.pbwiki.com).	
Blogs and micro blogs- These are personal websites that allow rapid updating by the author. Examples include Blogger (www.blogger.com) and Typepad (www.typepad.com). Content can be easily created and shared by making the blog accessible to others.	38
LinkedIn- LinkedIn connects you to your trusted contacts and helps you exchange knowledge, ideas , and opportunities with a broader network of professionals.	20
Google Maps: Personal maps- As a part of Google, users can create their own personal maps including photos, videos and audio via 'My Map.'	39
Podcasts- A digital recording, or podcast, is produced and then played on a digital media player. The digital recording is commonly in the form of an audio MP3 (MPEG-1 Audio Layer 3) file but it may also include other formats, including video	22
Instant messaging- This allows real time (synchronous) communication between two individuals (one to one) or between several individuals (one to many). Examples of commonly used text based services include MSN messenger (www.msn.com) and Yahoo! Messenger (www.yahoo.com).	42
Social bookmarking -is a method for Internet users to organize, store, manage and search for bookmarks of resources online. It is tagging a website and saving it for later. Instead of saving them to your web browser, you are saving them to the web. And, because your bookmarks are online, you can easily share them with friends. Have you ever e-mailed a student or fellow staff and sent them a link to a website you thought they might find interesting? If so, you have participated in social bookmarking	27
Moblogging- is "a form of blogging in which the user publishes blog entries directly to the web from a mobile phone or other mobile device (Wikipedia)."	8
Vlogging or Video blogging is "a form of blogging for which the medium is video" and it "takes advantage of web syndication to allow for the distribution of video over the Internet using either the RSS or Atom syndication formats, for automatic aggregation and playback on mobile devices and personal computers (Wikipedia)."	5
Flickr is a free online photo and video management site that is part of Yahoo. With a Yahoo account, anyone can join Flickr. Users can upload their photos from computers or camera phones by sending an email	24
Others	5

(Source: Field data)

When the respondents were asked on the frequency of use of different web 2.0 technologies for teaching and learning, the responses were as given in Table 4.

Table 4: How often respondents use web 2.0 technologies in teaching and learning

Types	*Rarely*	*Always*	*Not at all*
Facebook	26	32	7
Youtube	32	19	13
Twitter	28	11	22
E-mail	4	59	3
Wikis	18	16	27
Blogs	16	18	26
LinkedIn	17	7	34
Google Maps: Personal Maps	18	16	26
Podcats	14	8	37
Instant messaging	12	25	22
Social bookmarking	10	10	37
Moblogging	7	0	47
Vlogging or Video blogging	8	0	46
Flickr	15	1	41
Others ….	1	2	1

Respondents were asked to state what they have ever used web 2.0 technologies for and the responses were as in Table 5

Table 5: Responses on the usage of web 2.0 technologies

N=68

Usage of web 2.0 technologies	**Response (f)**
Use for collaboration with fellow scholars for the engagement of students' learning	49
Social networking with my students on academic matters	33
Just for social networking with my students	28
Creating learning/training materials for students	39
Sharing learning materials with my learners	44
Providing online distance learning	36
Use for online meeting with co-lecturers for the course I am teaching	31
Use for classroom announcements to students and discussion	42
Used as platform for sharing my research findings	43
Used for students assessment and submission of assignments	41
Used as a platform for intelligence gathering of what students are thinking about lecturers	25
Used for private business not related to my teaching job	37

4.3 Opinion of Academic Staff towards Web 2.0 Technologies for Teaching and Learning

The study also sought to understand the opinion of the academic staff towards web 2.0 technologies for teaching and the responses were as given in Table 6.

Table 6: Responses on the opinion of academic staff on web 2.0 technologies

N=68

Opinion	Somehow agree	Agree	Strongly Agree	Disagree
Web 2.0 technologies is not appropriate for teaching	17	1	2	46
Makerere university has not yet reached the level of using Web 2.0 technologies for teaching because of inadequate ICT facilities	12	19	11	23
It should be made compulsory for all academic staff in Makerere University to teach using Web 2.0 technologies	9	15	16	29
Age is a factor in adopting to web 2.0 technologies for teaching	10	13	15	28
We can do without web 2.0 technologies in teaching and learning and still get the same results	14	6	8	39
Modern teaching cannot do without web 2.0 technologies	12	14	31	10

4.4 Factors that hinder the Utilization of Web 2.0 Technologies by Academic staff in Teaching and Learning at Makerere University

When respondents were asked to state the factors that hinder there utilization of web 2.0 technologies in teaching and learning, the responses were as given in Table 7.

Table 7: Responses on the factors that hinder utilization of web 2.0 technologies (N=68)

Factors	Response
I have inadequate ICT skills	31

Students have inadequate ICT skills	47
Lack of steady supply of electricity	47
I just have negative attitude towards web 2.0 technologies	16
Lack of University support to provide ICT enabling environment for teaching with web 2.0 technologies	43
Students attitude towards ICT is poor and discourages use of web 2.0	26
Lack of a synchronized governance structure especially with blogs and collaborative works	29
Students do not want to be followed up on social media	24

When respondents were asked to give other factors on top of what were already prescribed in the questionnaire, the following we cited as other factors: Internet is expensive/ Low internet band width; Technophobia on side of staff; Increasing cases of cyber crime; Limited training in usage of ICT applications; Lack of time by staff; Inadequate ICT facilities to use the web 2.0 by the students; Lack of adequate teaching staff compared to the demand workload and lack of motivation of lecturers by the University so that they can be committed.

4.6 Suggestions to Promote Application of Web 2.0 Technologies

Respondents views were sought on what should be done to promote the use of web 2.0 technologies in teaching and learning in Makerere University and a number of suggestions were given. Table 8 gives the responses on strategies suggested

Table 8: Suggestions/Strategies to Promote Application of Web 2.0 Technologies in Teaching and Learning at Makerere University (N=67)

Suggestions/Strategies	*Response (f)*
The government of Uganda should find ways of making the internet cheaper	*45*
There should be awareness campaign and training by the University on web 2.0 application in teaching and learning.	*56*

Opening discussion groups should be created by Directorate of ICT in Makerere on web 2.0 technologies	*50*
There should constant power supply to allow students access computers at all times	*45*
The University should recruit adequate ICT staff to deal with the increasing number of students	***23***
New and favorable policies governing the usage by the government should be framed.	***11***
The University should improve on the internet band width	***14***

When the respondents were asked to indicate what they think should be included in web 2.0 technologies usage policy if was to be developed in higher education like Makerere University, the responses were as follow:

Table 9: Responses on what to be included in the Web 2.0 technologies policy (N=68)

Items to be in the policy	**Response (f)**
E-learning should be included in all the curricula	61
Web 2.0 technologies should be strictly for education purposes	34
Social technologies should not be included	12
The usage of web 2.0 technologies in teaching should be made mandatory to all academic staff	64
Every student should have a right to ICT services at low or no cost.	67
If anyone is caught stealing the computer or its accessories from the laboratory one should be suspended from the University or set a maximum price one should pay.	63
The privacy in using web technologies should be included in the policy	59
The web 2.0 technology usage policy should be in position to ban using the pornographic websites.	43

5. Discussions of Results

In a study conducted in United States in 2011, the majority - 58% said that they feel comfortable using web 2.0 technologies to connect with other students to discuss homework assignments and exams and they wished their instructors would incorporate sites like Twitter, MySpace, LinkedIn and Google+ into the curriculum more often (Rice, 2011; Mutula 2013). The need of these students tallies with the findings of this study in respects to what academic staff of Makerere University use web 2.0 technologies for. For instance, Table 5 shows that lectures use web 2.0 technologies in different engagement with students that include: creating learning materials; providing online distance learning; announcements to students and assessment of students. The propensity in the adoption of the use of web 2.0 technologies among students and their lecturers is gaining momentum every now and then. When you make analysis of Table 3 on the awareness of the web 2.0 technologies among academic staff in Makerere University, you notice that many are aware and even supported more awareness and training on web 2.0 technologies (See Table 7). With institutional inducement through institution supporting framework and policy on web 2.0 technologies in teaching and learning, there would be effective utilization witnessed. This is because when you look at Table 6, you notice that the majority of the respondents do agree that web 2.0 technologies are appropriate for teaching and learning especially when the problems identified in Table 7 like inadequate ICT skills and lack of supportive web 2.0 technologies infrastructure are addressed.

An analysis of Table 6 gives interesting findings. The majority of the academic staff do disagree with the statement that Web 2.0 technologies are not appropriate for teaching and when they were asked whether they could do without these technologies in teaching and still get the same results, the majority disagreed with statement. This confirms that web 2.0 technologies are considered useful platform for teaching and learning among Makerere University staff. Although, one would think that age is a factor in web 2.0 technologies utilization in teaching and learning, the respondents were almost equally divided with 38 agreeing with the statement and 39 disagreeing. Villano (2010) describes the changing academic platform in a poetic and yet challenging way:

> "The howling winds of open education are whistling through the hallways of academia everywhere, wrenching old ideas about how to identify and certify knowledge workers off their foundations. So how can knowledge workers of today ''land on their feet'' and grow into knowledge workers of 2020? (Villano, 2010: 1). All this demonstrates the fact that academicians in 21st century cannot afford to take the back seat in the adoption of web 2.0 technologies.

The above developments have implications for academic planners at Makerere University and other Universities in the region and beyond. In the first instance is the adoption of "newer" pedagogical skills by academics in the "ivory towers". Developments in the web 2.0 and the coming web 3.0 require that academicians should combine the traditional IT skills in using hardware/software and the institutional or aptitude to apply technology appropriately in the teaching-learning process. This will be the "Blended Academicians." For existing academicians without web 2.0 technology skills this implies more training. The view on more training is further supported by ACRL Research Planning and Review Committee (2010) who maintains that as technological changes continue to impact the academic routines and procedures, Academicians ought to "proactively" broaden their skill portfolio to remain relevant. This implies hiring skilled personnel and continuous formal training for Academicians in African Universities.

Another critical implication of the new developments to support the adoption of web 2.0 technologies is the immediate digitization of retrospective collection held in the University libraries. It should be noted that digitization projects make 'hidden' less used and underused special collections available to researchers worldwide (ACRL Research Planning and Review Committee, 2010) . Yes, it is true that there is evidence of some digitization projects taking place at Makerere University and other African Universities. However, the scope is still small compared to the perceived need to belatedly preserve and provide access to these unique collections which can only be referred to as historical gems. It should however be commented that current efforts of digitization noted above attest to the acknowledgement of a new data curation opportunities and requirements for data preservations in the 21st century. The adoption of web 2.0 technologies would require access to many online resources where lecturers would give web addresses (URLs) or send digitized copies of information to students using different web 2.0 technology platforms. The fact that the majority (See Table 9) do agree that the University should have a policy on web 2.0 technologies adoption and utilization and making e-learning /use of web 2.0 technologies compulsory attests to the projection of success.

The new developments in all ICT elements in academic units also imply a paradigm adjustment (paradigm shift). A paradigm shift can be described as a change in the

pattern of thinking or behavior. When we analyse Table 5 on how staff are using web 2.0 technologies and Table 4 on how often web 2.0 technologies are used, you notice that there is a paradigm shift in adopting modern technology platforms in teaching and learning. . Kuhn (1962) observes that paradigm shifts imply change in a fundamental model of events. For academic units this implies that things are no longer going to be the same and as such there is a need to change the way Academicians and libraries 'think'. Among the many areas on possible paradigm shifts include the following;

i) That the mission and the vision of the academic units ought to be altered to include elements of modern technology. Today the mission of the academic units in Makerere University is stated as ***"To meet the study, teaching, research and outreach information needs for sustainable development"***(Makerere University, 2014)**.** Although this may be interpreted to imply a willingness to embrace technology, a more deliberate mission statement highlighting technology ought to be coined to influence the thinking and planning processes of the academic units.

ii) That the academic units strategic plans ought to be altered to include elements of technology and related technologies as core planning areas.

iii) That the academic orientation programmes and procedures should be planned and conducted in a way that use of Information technologies and related end user applications are core training platforms.

One more implication is requirement for new management skills. The term management according to Hislop (2009) implies the ability to get things done using available resources. A look at the expectations of the respondents depicted in Table 8 and 9 shows that a lot is desired from University leadership in putting in place strategic policies and systems to embrace web 2.0 technologies adoption and utilization. Developments in information technology are changing the trend of the nature of resources to a more electronic outlook. This demands for a new array of skilled personnel serving a 'new' clientele. As such the staff, resources and clients are all 'new' and they continue to evolve in form, quantity and expectations. All this implies new leadership and management agenda; an agenda that can blend skills of the past, the present with an eye for the future. Harris (2010) affirms this view as he contends that new management skills in a 'Technology Fluent World' would be fundamental in the creation of an appropriate environment. It is this 'appropriate environment' that would

guarantee the creating of a space for the learning, skill development, comfort level and change management that needs to happen lest the demise of the Academic units relevance in the 21st Century.

From the above presentation, it is evident that the service improvements in Information Technology development require Academic units to change. However, as Joint (2009) observes, simply accumulating new technologies and related services as the opportunities arise may in the end be impractical, and may present intractable difficulties in terms of workload, security, authentication and intellectual property management. It is therefore prudent that if an academic unit does not actively embrace and implement Information Technologies in the conduct of its routines and execution of future strategy, its future is beyond doubt in jeopardy. The expectations of academicians are high in the adoption of web 2.0 technologies and academic units need to adjust to meet these needs.

6. Conclusion and Recommendations

It should be noted that the 21st century client is technologically affluent and expects more from the academic units. New students entering Universities today can be said to not only require information but also a memorable experience. Lenhart (2009) in Canuel and Crichton (2011) contend that by the age of 17, 84 percent of American children have had contact with computers and smart phones. In South Africa, Uganda and Tanzania, mobile and broadband penetration continues to rise faster than many other sectors on the economy (Lusweti 2010). This has exerted extra pressure on the academic units of the day all over the world and now in Africa. This pressure is explained by the explosive developments in global technological applications both in the hardware and software and the increasing demands by the technologically affluent clients. As such, higher levels of service fluency are expected of academic units and Universities in particular. It is encouraging to note that majority of academic staff who participated in the study support the integration of web 2.0 technologies in teaching and learning. What is needed is setting up a favorable adoption and utilization environment through administrative and policy reforms. There should also be a university concerted effort to make awareness campaign and training of staff on web 2.0 application in teaching and learning. This should be embedded within the current e-learning policy being considered by the University. Importantly,, the University Library

services should take a lead in adopting the web 2.0 technologies to support the teaching and learning especially in regards to the provision and access to digital and electronic information resources.

References

ACRL Research Planning and Review Committee. 2010. 2010 top ten trends in academic libraries: A review of the current literature. *ACRL Tech Connect*, 286-292.

Canuel R. & Crichton C. 2011. Canadian academic libraries and the mobile web. *New library world*. 112(3/4), 107-120.

Chokri, B. 2012. *Factors influencing the adoption of the e-learning technology in teaching and learning by students of a university class*. European Scientific Journal December edition. 8 (28), 165-190

Christensen, C M. 1997. *The Innovator's Dilemma*. Massachusetts, Harvard Business School

Cohen, L B. 2007. *Library 2.0 Initiatives in Academic Libraries*. Chicago, Association of College & Research Libraries

Cormode, G. & Krisnamurthy, B. (2008), *Key Differences Between Web 1.0 and Web 2.0*, available at http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2125/1972. Accessed 29 January 2014

Cybermetrics Lab 2013. *Ranking of web Universities.* Available at http://www.webometrics.info/en/Africa. Accessed 29 December 2013

Davis, I. 2005. *Talis, Web 2.0 and All That*. Available at http://blog.iandavis.com//2005/07/talis-web-20-and-all-that. Accessed 29 December 2013

Fleck, J. 2007, *Technology and the business school world*. *Journal of Management Development*, 27 (4). 415-425.

Grange, T. 2011. *Reflections of a Dean.* BizEd. November/December. 32

Greenhow, C., Robelia, B., & Hughes, J. 2009. *Learning, teaching, and scholarship in a digital age. Web 2.0 and classroom research: what path should we take now?* Educational Researcher. 38 (4), 246-259.

Halverson, E R 2011. Do social networking technologies have a place in formal learning environments? *ON THE HORIZON,* 19(1), 62-67.

Harris C S. 2010, *Libraries (and Your Staff) in a Transliterate, Technology Fluent World*.

Tennessee: University of Tennessee

Hawawini, G. 2005. *The future of business schools*. Journal of Management Development, 24 [1], 70-83.

Hicks, A. & Graber, A. 2010. *Shifting paradigms: teaching, learning and Web 2.0*. Reference Services Review, 38 (4), 621 – 633.

Hislop, D. 2009. *Knowledge management in organizations*. Oxford: Oxford University Press.

Jordan, L. 2012. *Video for feedback and reflection: embedding mainstream engagement into learning and teaching practice.* Research in learning technology, 20 (4), 221-245

Khan, H B. 2001. *Elements of e-learning*, available at: http://elexforum.hbmeu.ac.ae/Archive/2008/downloads/Presentations/Post%20Forum%20Workshops/Day%201/Elements%20of%20e-Learning%20Quality%20by%20Badrul%20Khan/Elements%20of%20e-Learning%20Quality%20by%20Badrul%20Khan.pdf . Accessed 20 January 2014

Kuhn, T. 1962. *The Structure of Scientific Revolutions*. Chicago: Chicago University Press.

Liam, M. 2012. *Generation Y, learner autonomy and the potential of Web 2.0 tools for language learning and teaching*. Campus-Wide Information Systems, 29 (3). 166 - 176

Luo, L. 2010. *Web 2.0 integration in information literacy instruction: an overview,* Journal of Academic Librarianship. 36 (1), 32-40.

Lusweti, P. 2010. *Broadband set to boom in Africa: new projects, new hope*. Geneva: International Telecommunication Union.

Makerere University. 2014. *Figures and figures*. Available at: http://mak.ac.ug/index.php?option=com_content&task=view&id=41&itemid=64:

Accessed 20 January 2014

Makerere University. 2013. *Annual Report*. Kampala, Makerere University

Maslen, G. 2012. *Massive Open Online Courses Challenge Higher education's Business Models*. Available at: http://mg.co.za/article/2012-09-21-massive-open-online-courses-challenge-higher-educations-business-models. Accessed 15 January 2014

McLoughlin, C. & Lee, M J W. 2008. *Mapping the digital terrain: new media and social software as catalysts for pedagogical change*, Proceedings Ascilite Melbourne. Available at: www.ascilite.org.au/conferences/melbourne08/procs/mcloughlin.pdf. Accessed 15 January 2014

Thomas, M. & Thomas, H. 2012. Using new social media and Web 2.0 technologies in business school teaching and learning, *Journal of Management Development*. 31(4), 358 – 367

Munguatosha, G M., Muyinda, P B. & Lubega, J T. 2011. A social networked learning adoption model for higher education institutions in developing countries, *On the Horizon*, 19 (4), 307 – 320

Mutula, S M. 2013. *Ethical Dimension of the Information Society: implications for Africa. In Information Ethics in Africa: Cross-Cutting Themes*, Pretoria: AC, 29-42

Newstead, H. 2007. Web 2.0/language learning. Available at:, http://web20andlanguagelearning.wikidot.com/what-is-web-2-0. Accessed 15 January 2014,

O'Reilly, T. 2005. *What is Web 2.0, O'Reilly Network*. Available at:, http://www.oreilly.de/artikel/web20.html. Accessed 15 January 2014

Prensky, M. (2010). Why YouTube matters. Why it is so important, why we should all be using it, and why blocking it blocks our kids' education, *On The Horizon*, 18(2), pp.124-31.

Rice, A. 2011. Students Push Their Facebook Use Further into Course Work. *The Chronicle of Hgher Education* – Available at: http://chronicle.com/blogs/wiredcampus/students-push-their-facebook-use-further-into-academics/33947. Accessed 15 January 2014

Shuell, T J. 1986, "Cognitive conceptions of learning", *Review of Educational Research*. 56 (4), 411-36.

Tusubira, F F. 2007. *Supporting universities' ICT developments: The Makerere University experience*. Available at http://www.fftusubira.com/publications/supporting_university.pdf. Accessed 20 January 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.

Villano, P. 2010. The Wizard of Oz Effect and a new Emerald City. *ON THE HORIZON, 18(3)*, 171-183.

Wesch, M 2008. *A Vision of Students Today (and What Teachers Must Do)*, available at: www.britannica.com/blogs/2008/10/a-vision-of-students-today-what-teachers-must-do/. Accessed 20 January 2014

Williams, J. & Chinn, SJ 2009. Using Web 2.0 to support the active learning experience. *Journal of Information Systems Education*. 20 (2), 165-174.