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## **Factors Influencing Pedagogical Activities in Web 2.0 Technologies Integration: A Case of Three Universities in Tanzania**

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### **Abstract**

The study examined the factors influencing integration of Web 2.0 technologies in teaching and learning in three universities in Tanzania. Specifically, the study aimed to examine the extent to which Web 2.0 technologies are used in performing academic tasks, motives behind the integration of Web 2.0 technologies in teaching and learning activities and factors influencing integration of Web 2.0 technologies in pedagogy activities. The study used the Unified Theory of Acceptance and Use of Technology. The study was conducted at Muhimbili University of Health and Allied Sciences, Sokoine University of Agriculture and University of Dar es Salaam. It involved 47 members of staff and 141 postgraduate students. A mixed approach was employed in the study. Accordingly, a cross-sectional survey alongside documentary review was used to collect data from randomly selected postgraduate students while purposive sampling was used to select faculty members. The findings show that Web 2.0 technologies were frequently used for some academic activities while others were used for social communication. Among the factors influencing integration of Web 2.0 are familiarity with the technologies, expertise on the use of Web 2.0, attitude towards the technologies and support on the use of such technologies. The study recommends that technical support on proper design and use of Web 2.0 tools should be provided in teaching and learning, and short courses and workshops should be organized for faculty members and students.

**Keywords:** Emerging technologies, Web 2.0 technologies, Integration of technology, E-Learning, Pedagogy

### **Introduction**

The introduction and use of the World Wide Web (WWW) can be traced back to more than three decades. It was first introduced by Tim Burners-Lee late in 1989 (Choudhury, 2014; Aghei, Nematbakhsh, & Farsani 2012) and it has been the source of the development of web-based technologies, which are now used for creating, sharing and accessing information worldwide. Indeed, it has greatly transformed the information cycle, that is, information generation, processing, dissemination, storage and preservation. Through this development, many web innovations have emerged to-date. Likewise, Choudhury (2014) asserts that the capabilities of the World Wide Web have thus far experienced three major innovations: Web of documents

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(Web 1.0), Web of people (Web 2.0), and Web of data (Web 3.0). In fact, a lot of development in terms of service provision and applications has been experienced due to Web technology development. Consequently, Web technology developments have experienced a large explosion of new ideas and sharing, applications and new services to add value to the existing services (Dwivedi, Williams, Mitra, Niranjana, & Weerakkody, 2011). Since the discovery of the World Wide Web and its generations, a lot of research on services and applications has been undertaken to determine the viability of the Web technology in different fields of operation in business companies and organisations.

The first generation, Web 1.0, is sometimes referred to as static and passive web or non-interactive web pages (Choudhury, 2014; Virkus, 2008) and was the read-only web (Aghei, Nematbakhsh, & Farsani 2012). Indeed, it provided only very little interaction to users or consumers of the website. The users used the web only to access information with little or no opportunity to comment or correct the information accessed from the web. Therefore, Web 1.0 lacked vigorous representation of the web readers as they could not comment or add any information to the static information accessed. As a result, it paved the way for further innovation in the Web technology, which resulted into the introduction and use of the second generation of the Web called Web 2.0 technologies. Unlike the former, this generation of the web is more interactive as it allows users to create, comment, correct or add more information.

The deployment of Web 2.0 technologies in the education sector especially in pedagogical activities has brought about innumerable changes regarding how staff members and students create, communicate and share information. It is the case that Web 2.0 encourages collaboration and user contribution of ideas in a participatory environment (Virkus, 2008). Gaffer, Singh and Thomas (2011) emphasise that, in Web 2.0, users are active developers of ideas and can question and critique concepts and ideas in ways that were not possible before Web 2.0. Web 2.0 services have been used in business companies, libraries, education institutions, health facilities and many other sectors. In developed countries, Web 2.0 is being used to improve the quality of teaching, learning, research, communication as well as information access, retrieval and transfer (Lwoga, 2012). A study by Howe and Kekwaletswe (2010) shows that Web 2.0 technologies are used to foster academic discussion, store and share information, handle collaborative class assignments and referencing. Consequently, it has “transformed students’ engagement in the learning process through the use of World Wide Web and have made inroad education” (Virkus, 2008). According to Gaffer, Singh and Thomas (2011), Web 2.0 presents opportunities to shift from teacher-centered to learner-centered approaches by allowing maximum collaboration and participation in the learning process. Based on this ground, various studies have been carried out in Europe, America and Australia aimed to understand the use of Web 2.0 technologies in education and how it can elevate the quality of learning in institutions of higher learning.

A study by Franklin and Harmelen (2007) on shows that universities in Africa and particularly South Africa have undergone substantial changes in terms of technology usage. A study by Kelly (2008) reveals that the use of Web 2.0 in South Africa is largely developing on the fringes of institutional educational programmes, through experimentation by individual university staff, small research and pilot projects or by students. A study conducted in Tanzania by Lwoga (2012) shows that some universities (Muhimbili University of Health and Allied Sciences - MUHAS and Open University of Tanzania - OUT) are formally integrating Web 2.0 technologies while others (University of Dar es Salaam - UDSM and Sokoine University of Agriculture - SUA) are informally integrating such technologies to enhance teaching and learning activities. For example, Web 2.0 is integrated into Moodle platform at MUHAS and it



forms part of an information and learning technologies course which is taught to all first-year undergraduate students in the first semester (Nagunwa & Lwoga, 2012). Also, there are other universities which have neither formally nor informally integrated the technologies in their main websites or linking websites (Kazoka, 2016). One might wonder why there is such discrepancy. This suggests that there are factors influencing the integration of Web 2.0 technologies in teaching and learning activities. Therefore, in order to comprehend the divergence and convergence among staff members and students in universities in Tanzania, this study aimed to examine factors influencing integration of Web 2.0 technologies in teaching and learning activities. Specifically, the study sought to examine:

- i) the extent to which Web 2.0 technologies are used to perform academic tasks;
- ii) motives behind the integration of Web 2.0 technologies in teaching and learning activities; and
- iii) factors influencing integration of Web 2.0 technologies in pedagogy activities

## **Review of Related Literature**

### ***Integration of Web 2.0 Technologies in Teaching and Learning Activities***

Literature sources (see Lwoga, 2012; Mollel, 2013; Gaffer, Singh, & Thomas, 2011) indicate that there has been a growing trend to incorporate technology in education to fulfil some of the technological expectations of students. Currently, students are inclined to use technology more than they have done in previous years, that is why they have been referred to as digital natives/digital citizens (Lwoga, 2012; Mohammad, 2011; Green & Hannon, 2007). Furthermore, findings of a study conducted by Mohammad (2011) in Kuwait on modelling students' perceptions on Web 2.0 technologies adoption indicates that developing an interactive, inquiry-based, technology-rich curriculum is necessary for preparing students for the present complex world. Furthermore, using interactive learning methods has been found to help learners understand complex materials and to transfer information and concepts learned in one setting to a problem-solving process confronted in another setting, effectively (Gadanidis, Hoogland, & Hughes, 2008). In other words, students are able retain knowledge when they are actively engaged in their learning and are required to apply what they have learned (*ibid.*). Other studies (Jimoyiannis, Tsiotakis, Roussions, & Siorenta, 2013; Green & Hannon, 2007) show that today's digital students (digital natives) learn more when they are engaged in meaningful, relevant, and intellectually stimulating schoolwork.

Notably, these twenty-first century students need more engagement in the learning process through collaboration in knowledge creation (co-creation of knowledge), in which they use Web 2.0 tools. Jimoyiannis *et al.* (2013), Koloseni & Omary (2011), and Salehe (2008) assert that using Web 2.0 applications in teaching and learning can offer students an interactive and collaborative learning experience through the use of a medium they are familiar with. However, a study conducted by Gaffer *et al.* (2011) at the University of Guyana shows that some students were uncomfortable with the use of Web 2.0 tools, suggesting that any Social Networking Software (SNS) should be limited to social interaction and should not be used in the educational context.

A significant empirical evidence from previous studies conducted by a number of researchers confirm that interactive and collaborative learning cannot happen without the Factors Influencing Pedagogical Activities in Web 2.0 Technologies Integration: A Case of Three Universities in Tanzania

acquisition of knowledge and skills of using such kind of technological innovation in the teaching and learning process. These include Kazoka (2016) who carried out a study on the potentials of integrating Web 2.0 technologies in teaching and learning activities in universities in Tanzania. Others are Mohammad (2011) on modelling student perception of Web 2.0 technologies adoption in Kuwait, and Gaffer, Singh and Thomas (2011) who studied the readiness of lecturers at Caribbean University in adopting Web 2.0 in the education process. As Green and Hannon (2007) contend, “it is not possible to grow the creative industries unless there’s a growth in the acquisition of the right kind of skills.” This statement implies that there is a need of both intrinsic and extrinsic motivation of individual staff members and students to acquire knowledge and skills in the integration of technology, in the teaching and learning process. Ultimately, such a push would create an effective framework for developing strategies to encourage staff members and students to use Web 2.0 technologies in teaching and learning. The emphasis here is on the acquisition of the right skills pertaining to the application of Web 2.0 tools by both lecturers and students, since doing so is a prerequisite for effective adoption of such technologies in teaching and learning

### ***Factors Influencing the Use of Web 2.0 Technologies in Teaching and Learning Practices***

There are several factors influencing the use of Web 2.0 technologies in teaching and learning activities. The following sections provide these factors, which include personal characteristics, technology self-efficacy, and academic discipline.

#### *Personal Characteristics*

Some studies (Mollel, 2013; Buabeng-Andoh, 2012; Mohammad, 2011) have analyzed the influence of personal characteristics on technology acceptance and integration. These studies indicate that personal characteristics such as age, gender, educational level, experience with the computer for educational purposes and attitude towards technology have been found to affect the adoption and usage of information technologies. Elkaseh, Wai Wong, and Che Fung (2016) and Green and Hannon (2007) found out that that younger and well-educated people are more interested in and use new technology because they are less likely to be anxious about using it. Some studies (see Almobarraz, 2007) demonstrate that gender significantly impacts on the use of the Internet and related technologies such as Web 2.0 technologies. In contrast, Chan and McLoughline (2008) found that younger, better educated people believed the Internet was more useful than other categories of respondents, but found no significant differences in the perceptions across gender. Some scholars (see Buabeng-Andoh, 2012), on the other hand, agree that personal attitude towards the technology greatly influences the adoption and integration of technology into teaching and learning. Furthermore, some studies (such as Mohammad, 2011 citing Lehart & Madden, 2007) indicate that females are more aware of and use Web 2.0 applications than males. Thus, these personal characteristics should be taken into consideration when studying technology adoption, especially in teaching and learning.

#### *Technology Self-Efficacy*

In a technology mediated learning environment, technology self-efficacy has been found to significantly impact on students’ adoption and use of technologies and learning performance (Mohammad, 2011; Venkatesh & Davis, 2000). These authors argue that, if users feel uncomfortable with the technologies they use in their learning, they may experience difficulties in their interaction with peers and instructors, and in the completion of their assignments. This negatively affects their attitudes towards the use of technology and also impact on their learning



outcomes. In this regard, Buabeng-Andoh (2012) citing Kristensen and Knezek (2006) assert that competence and confidence in the use of technology is a key factor in raising confidence of using technology. Thus, competence and confidence on the use of Web 2.0 technologies constitute key factors for their proper integration, for both faculty members and students in teaching and learning activities. This could be attained by training faculty members and students in the use of Web 2.0 technologies for teaching and learning purposes and letting them see the pedagogical value of these technologies in the teaching and learning process.

#### *Enrolment in Academic Programmes*

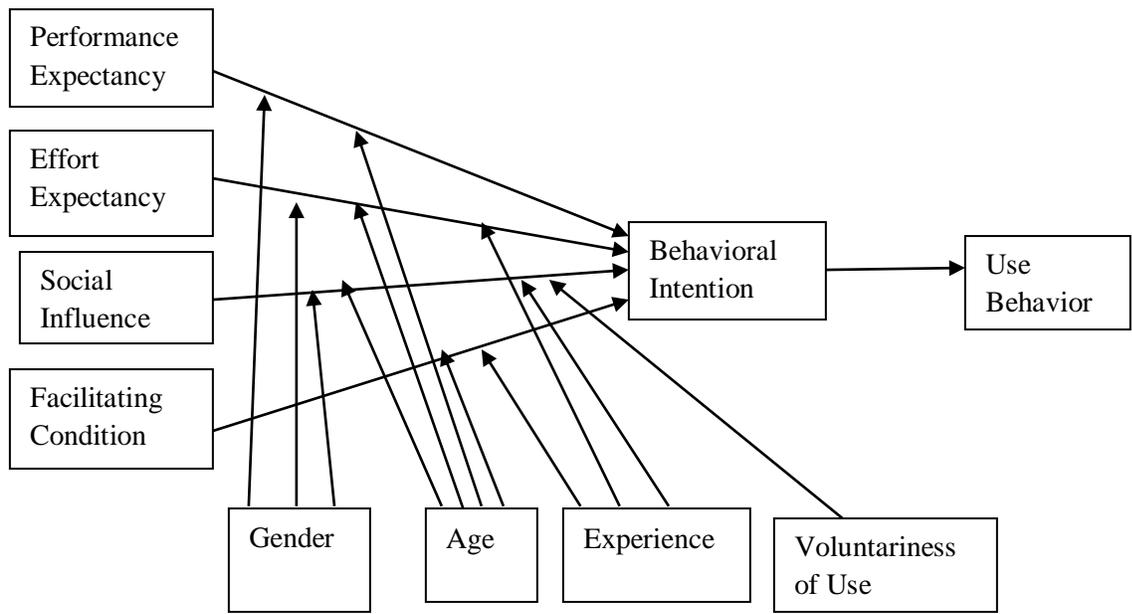
The adoption of technology such as Web 2.0 tools in the teaching and learning process is sometimes influenced by the academic programmes in which students get enrolled. Several studies have been undertaken to analyse the connection between the academic fields of students and the time they spend applying those technologies in their academic activities. Mohammad (2011) citing Educause Centre for Applied Research (ECAR) (2008) claims that there are no significant differences in Information Technology (IT) use, although students majoring in engineering and business use IT more often than those from other disciplines. Other fields with notable uses were education, library science, knowledge management and business; these have widely applied different technologies for different purposes such as exchanging information, sharing knowledge, marketing products and services and developing curricula (Mohammad, 2011).

#### **Theoretical framework of the study**

This study adopted the Unified Theory of Acceptance and Use of Technology (UTAUT) model which was developed by Venkatesh and colleagues in 2003. Venkatesh, Morris, Davis, G. B. and Davis, F. D. (2003) reviewed and consolidated eight prominent technology adoption models to develop a new unified model called the UTAUT. The eight models reviewed were the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model, Theory of Planned Behaviour (TPB), Diffusion of Innovation (DoI) Theory, Combined TPB/TAM, Model of PC Utilization, and Social Cognitive Theory (SCT).

The UTAUT, as postulated by Venkatesh *et al.* (2003), has four constructs that play a significant role as direct determinants of user-acceptance and usage behaviour of technology. These are 'performance expectancy', 'effort expectancy', 'social influence', and 'facilitating conditions' (See Figure 1 below). Mollel (2013) and Vanketesh *et al.* (2003) define performance expectancy as the degree to which an individual believes that using the system can help him or her obtain gains in a job performance.

Characteristically, effort expectancy is the degree of ease associated with the use of the system. As for social influence, it refers to the degree to which an individual believes that his or her colleagues think he or she should use the new system. Finally, the facilitating conditions refer to the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system (Masele, 2014).



**Figure 1: Unified Theory of Acceptance and Use of Technology**  
 Adopted from Venkatesh *et al.* (2003)

On the whole, these constructs are key determinants of usage of technology. Gender, age, experience and voluntariness of use act as moderators of the impact on the four constructs on the usage intention and behaviour (Masele, 2014; Venkatesh *et al.*, 2003). All the four constructs (performance, effort expectancy, social influence and facilitating conditions) and the moderators of this model were used to determine the extent to which they influence instructors and students to integrate Web 2.0 technologies in the teaching and learning process, in the universities surveyed.

**Methodology**

This study employed a mixed research design. Creswell (2003) and Johnson and Onwugbuzie (2004) contend that a mixed research design is a systematic inquiry where the researcher mixes or combines quantitative and qualitative research approaches, sampling procedures, methods, and analysis in a single study. In this research design, there is a combination of research methods that involves the collection, analysis, and integration of quantitative and qualitative data in a single or multiple studies (Marczyk, Dematteo, & Festinger, 2005). The present study used a mixed research design to explore factors influencing integration of Web 2.0 in teaching and learning activities.

The study was conducted in three public universities in Tanzania. These were the University of Dar es Salaam, Sokoine University of Agriculture, and Muhimbili University of Applied Sciences. These universities were selected based on the fact that they have well established ICT infrastructure and have adopted e-learning technologies in some programmes (Lwoga, 2012). The study involved a total of 188 respondents where 141 were postgraduate students and 47 were staff members. Simple random and purposive sampling methods were used to select a sample for the study. In order to get respondents from the postgraduate students, it was necessary to use a simple random sampling technique. Purposive sampling was used to select 7 staff members who were interviewed during this study. Kothari (2004) asserts that the



researchers in the purposive sampling procedure select items for the sample deliberately and their choice concerning an item remains supreme.

A cross-sectional survey method was used to collect data by using both questionnaires and structured interviews. Kazoka and Mwantimwa (2019) suggest that it is necessary to use a combination of these methods considering the nature of the research problem under study and the fact each of these instruments has both advantages and disadvantages in the research process. In the final analysis, when used together they complement each other, whereby the weaknesses of one are addressed by the strengths of another in data collection. Standardized questionnaires with both open and closed-ended questions were administered to postgraduate students and faculty members in this study. The questionnaire contained specific questions formulated on the basis of the research objectives. General questions such as the profile of the respondents added value to the research despite having no direct relationship to the objectives of the study primarily because such information laid the background of the study. The respondents' socio-demographic characteristics provided a snapshot on the background of the respondents and their suitability for the inquiry. Regarding scales, nominal and ordinal scales (i.e. Likert scale) were used to set questions. Along that, face-to-face interviews with key informants were also used to collect qualitative data.

The data collected was subjected to quantitative and qualitative analysis. Qualitative data was analyzed under the various themes that corresponded to the specific objectives of the study. The qualitative data was analyzed using content analysis of ethnographic summaries, direct quotations and selected comments from informants. Findings are summarized and used to complement those found in the quantitative methods. Descriptive statistics (frequency and percent) were performed using Statistical Package for the Social Sciences Version 22, and presented in the form of tables.

## **Results**

### ***Socio-demographic Characteristics of the Respondents***

It was useful to consider the socio-demographic characteristics of the respondents. These included information about their gender, age, designation, and affiliated discipline. The integration of Web 2.0 technologies sometimes has a connection with the academic discipline the postgraduate students are pursuing or faculty members. Indeed, some academic disciplines such as computer studies have a higher inclination towards using such technologies than other disciplines. To gauge the difference, descriptive statistics (frequency and percent) was performed as Table 1 presents:

**Table 1: Socio-demographic Characteristics of the Respondents**

Personal characteristics (n = 188)		Staff Members		Postgraduate Students	
		F	%	F	%
<b>Gender</b>					
	Female	15	31.9	57	40.4
	Male	32	68.1	84	59.6
<b>Age</b>					
	20 - 29 years	15	31.9	90	63.9
	30 - 39 years	28	59.6	47	33.3
	40 - 49 years	3	6.4	4	2.8
	50 - 59 years	1	2.1	0	0
<b>Academic Discipline</b>					
	Social Sciences and Humanities	10	21.3	72	51
	Business, Marketing and Management	5	10.6	5	3.5
	Computer Sciences and Information Studies	24	51	23	16.3
	Education	3	6.4	7	5
	Engineering, Agricultural and Natural Sciences	2	4.2	16	11.4
	Health and Allied Sciences	3	6.4	18	12.8

Note: F = Frequency; % = Percent

Source: Field Data, 2016

Results regarding gender show that the majority of respondents from staff members (68.1%) and postgraduate students (59.6%) were male. Besides, the results show that most of the postgraduate students were aged between 20 and 29 years while most of the staff members were aged between 30 and 39 years.

Accordingly, the results show that most of the respondents (51%) belonging to the category of students belonged to social sciences and humanities, computer sciences, library and information studies (16.3%), engineering, agricultural and natural sciences (11.4%), education (5%) business studies (3.5%), and from health and allied sciences (12.8%). These results show that most of the students enrolled into higher learning institutions are from social science disciplines.



### Extent to which Web 2.0 Technologies are used to Perform Academic Tasks

As pointed out earlier, this study sought to gain insights on the extent to which Web 2.0 technologies were applied in performing academic tasks. This aimed to find out whether or not staff members and postgraduate students had access to the Internet and had experience of using Web 2.0 technologies in teaching and learning. The results disclose that the majority of postgraduate students (99.2%) and staff members (100%) accessed the Internet and most of them had experience of more than five years using Web 2.0 technologies. Therefore, a significant percentage (71.1) of staff members and postgraduate students had enough experience of using such technologies.

Furthermore, the findings indicate that the extent to which staff members and students make use of Web 2.0 technologies is largely related to their experience in using such technologies. For example, the findings show that 40.4% of staff members and 32.6% of students had five years experience and they frequently used Web 2.0 technologies, whereas 19.1% of staff members and 18.4% of students had three years and frequently applied Web 2.0 technologies. For further details, see Table 2 .

On the extent to which staff members and postgraduate students use Web 2.0 technologies, the results show that 52.5% of postgraduate students and 59.6% of academic staff frequently used Web 2.0 technologies while 44.7% of postgraduate students and 38.3% of academic staffs occasionally used Web 2.0 technologies to accomplish their academic tasks. Their responses are recorded in Table 2:

**Table 2: Access to Internet and Use of Web 2.0 Technologies (n=188)**

Response		Staff Members		Postgraduate Students	
		F	%	F	%
<b>Access to Internet</b>	Yes	47	100	140	99.2
	No	0	0	1	0.8
<b>Use of Web 2.0 technologies</b>	Yes	46	97.9	138	97.9
	No	1	2.1	3	2.1
<b>Frequency of Use of Web 2.0</b>	Frequently	28	59.6	74	52.5
	Occasionally	18	38.3	63	44.7
	Never	1	2.1	4	2.8

Note: F = Frequency; % = Percent

Source: Field Data, 2016

Web 2.0 technologies can be deployed for multiple services and uses. Some people use them for scholarly communication; for example, Academia.edu and others use them for social communication through Facebook. In the studied universities i.e. SUA, UDSM and MUHAS, it was established that individual staff members used Web 2.0 technologies for creating educational discussion platforms using wikis and blogs. Descriptive findings of this study show that 59.6% of staff members and 52.5% of postgraduate students frequently used Web 2.0 technologies. The study findings suggest that some individual faculty members in the universities surveyed use Web 2.0 technologies in teaching and learning activities although they might use them accidentally.

#### Motives behind Using Web 2.0 Technologies in Teaching and Learning Activities

Findings on the motives behind faculty members and students using Web 2.0 technologies in teaching and learning are summarized in Table 3.

**Table 3: Motives behind Using Web 2.0 Technologies in Teaching and Learning Activities**  
(n = 47)

Motives for Using Web 2.0 Technologies	Agree	Neutral	Disagree
Personally interested in using new technologies and strategies	45(95.7%)	2(4.3%)	0(0%)
Students requested to incorporate Web 2.0 in teaching activity	2(59.6%)	12(25.5%)	7(14.9%)
Observed successful use of Web 2.0 technologies from someone else's class	22(68.1%)	12(25.5%)	3(6.4%)
Recognition among peers	32(68.1%)	14(29.8%)	1(2.1%)
I've seen the benefits of integrating Web 2.0 technologies in teaching	44(93.6%)	3(6.4%)	0(0%)
Directives from the administration to integrate technologies in teaching activity	31(66%)	14(29.8%)	2(4.2%)
It is inevitable in the current teaching and learning	38(82.7%)	3(6.5%)	5(10.9%)

Source: Field Data,2016

The results presented in Table 3 show that 44(93.6%) respondents admitted that they had seen the benefits of integrating Web 2.0 technologies in the teaching and learning process whereas three (6.4%) of the respondents neither agreed nor disagreed with this statement. The study results further show that 45(95.7%) respondents were personally interested in applying new technologies and strategies in teaching compared to only two (4.3%) respondents who neither agreed nor disagreed with the statement. Some lecturers indicated that they received requests from students to incorporate Web 2.0 technologies in teaching and learning activities.



The results show that 32(68.1%) of the respondents agreed that they had noticed the use of Web 2.0 technologies from someone else's class and three (6.4%) disagreed that they had observed successful use of Web 2.0 technologies from someone else's class. About 12(25.5%) neither agreed nor disagreed with the statement. On the other hand, 32 (68.1%) respondents said that they had integrated Web 2.0 technologies because they wanted recognition from their peers and doing so greatly encouraged them to integrate the web-based tools in the courses they taught. One (2.1%) respondent disagreed that he/she needed recognition from his/her peers whereas 14(29.8%) respondents neither agreed nor disagreed with the statement that they needed recognition from their peers.

The findings show that 31(66%) staff members agreed that they had started integrating Web 2.0 technologies as a result of directives from the university management, whereas 2(4.3%) staff members disagreed and 14(29.8%) neither acknowledged nor disagreed with the university administration's directives playing a role in their integrating new technologies such as Web 2.0 technologies in teaching and learning.

On the other hand, 38(82.7%) staff members in this study indicated that the integration of Web 2.0 technologies was inevitable in the current teaching and learning at university. Only 5(10.9%) respondents disagreed that the current teaching and learning environment in the universities forced them to integrate Web 2.0 tools in teaching and learning and three (6.5%) neither agreed nor disagreed that the current teaching and learning environment in the universities was a fundamental factor.

### Factors Influencing Integration of Web 2.0 Technologies in Teaching and Learning

There are many factors influencing the integration of Web 2.0 technologies in teaching and learning activities. Table 3 below summarizes the findings.

**Table 4: Factors Influencing Integration of Web 2.0 Technologies in Teaching and Learning (n = 181)**

	StaffMembers (n=47)			Postgraduate Students (n=141)		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree
Familiarity with the Web 2.0	46(97.9%)	1(2.1%)	0(0%)	112(83%)	15(11.1%)	8(5.9%)
Expertise on the use of Web 2.0 tools	41(87.2%)	3(6.4%)	3(6.4%)	98(72.6%)	22(16.3%)	15(11.1%)
Attending training on the use of Web 2.0	43(91.5%)	4(8.5%)	0(0%)	109(80.7%)	12(8.9%)	14(10.4%)
Attitude towards Web 2.0 platforms	42(89.4%)	5(10.6%)	0(0%)	97(72.4%)	25(18.6%)	12(9%)
Ease of use of Web 2.0	41(87.3%)	5(10.6%)	1(2.1%)	83(60.6%)	33(24%)	21(15.4%)

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Habit of sharing information with others	43(91.5%)	4(8.5%)	0(0%)	114(82.6%)	16(11.6%)	8(5.8%)
Getting technical support on the use of Web 2.0	37(78.7%)	10(21.3%)	0(0%)	94(70.1%)	30(22.4%)	10(7.5%)
Support from the university management	33(70.2%)	10(21.3%)	4(8.5%)	89(63.1%)	24(17%)	28(19.9%)
Presence of facilities and supporting infrastructure	34(72.3%)	11(23.4%)	2(4.3%)	92(65.2)	26(18.4%)	13(9.2%)

Source: Field Data, 2016

The study findings show that familiarity with technologies plays a crucial role in the process of adoption of the same. The results show that 46(97.9%) of academic staff and 112(83%) of postgraduate students agreed that familiarity would influence the integration of Web 2.0 technologies in teaching and learning whereas 8(5.9%) of students disagreed.

Furthermore, the results show that 43(91.5%) of academic staff and 109(80.7%) of postgraduate students agreed that training is one of the aspects that influence the integration of Web 2.0 tools in teaching and learning. Moreover, expertise on the use of Web 2.0 technologies in teaching and learning was revealed to be one of the factors influencing the use of Web 2.0 tools in the teaching and learning process. The findings further indicate that 41(87.2%) of academic staff and 98(72.6%) of postgraduate respondents saw expertise as one of the factors that influence the use of Web 2.0 technologies, whereas 3(6.4%) of academic staff and 15(11.1%) of postgraduate students disagreed with the statement.

Regarding the ease of use of Web 2.0 technologies in teaching and learning activities, the results show that 41(87.3%) academic staff and 83(60.6%) postgraduate students agreed that the ease of use of Web 2.0 technologies as platforms has a bearing on the integration of such web-based tools in the teaching and learning process. On the other hand, 1(2.1%) academic staff and 21(15.4%) postgraduate students did think that ease of use of Web 2.0 technologies influenced the integration of the technologies in the teaching and learning process.

Faculty members and students were asked to indicate their attitude towards the integration of Web 2.0 technologies as teaching and learning platforms. The results show that 42(89.4%) academic staff and 97(72.4%) postgraduate students affirmed that attitude towards Web 2.0 tools could influence its integration in teaching and learning.

Basically, for smooth integration of Web 2.0 technologies to occur, certain conditions must first be met. These prerequisites in the institutions under study include support from the university management who should make sure that ICT infrastructure is in place, including favourable ICT and E-learning policies, and ICT tools, which were the focal point in this regard. The results show that 33(70.2%) academic staff and 89(63%) postgraduate respondents agreed that support was necessary, while 4(8.5%) academic staff and 28(19.9%) postgraduate students disagreed. Furthermore, the study findings show that 34(72.3%) staff members and 92(65.2%)



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postgraduate students agreed that facilitative conditions such as ICT infrastructure, ICT and E-learning policies and availability of ICT tools influence the integration of Web 2.0 technologies in the teaching and learning process.

Provision of technical support is necessary for efficient use of technologies in the teaching and learning process. The results show that 37(78.7%) staff members and 94(70.1%) postgraduate students agreed, whereas 10(7.5%) postgraduate students disagreed that getting technical support is critical in the integration of Web 2.0 tools in the teaching and learning processes in the universities under review. Furthermore, Web 2.0 technologies have features that allow users to share information and contents. The findings show that 43(91.5%) academic staff and 114(82.6%) postgraduate respondents agreed that sharing of information and contents influenced their use of Web 2.0 technologies in teaching and learning.

## **Discussion of the Findings**

### ***Motives behind the Use of Web 2.0 Technologies in Academic Activities***

The study findings show that staff members and students acknowledged the benefits of integrating Web 2.0 technologies in teaching and learning. They started to apply them in academic activities because they believed they could help them to enhance their performance whereas others integrated the technologies in their activities because of their personal interests. In fact, staff members who used Web 2.0 technologies in teaching and learning activities were those who had used them previously or had attended training and, hence, had seen the benefits of adopting such technologies. To a great extent, the performance facilitative role of Web 2.0 tools has motivated staff members and students to integrate Web 2.0 technologies in teaching and learning activities in the universities surveyed. In this regard, Masele (2014) observes that individuals or organisations tend to adopt technologies once they realise that they offer direct financial and operational benefits.

Personal interest in using new technologies and social influence from peers play a big role in the adoption and integration of technologies in teaching and learning activities. For staff members to integrate new teaching technologies, they were sometimes influenced by other staff members who had already started using such technology, for example, early adopters. Evidently, the study findings indicate that social influence has a big role to play in the adoption and integration of technologies in teaching and learning. As for this study, the findings show that, 68.1% of the faculty members and students reported that they had observed successful use of Web 2.0 technologies from their fellow faculty members. Basically, some faculty members had integrated Web 2.0 technologies because they wanted recognition from their peers and that had greatly influenced the latter to integrate such technologies in the courses they teach. These findings indicate that social influence has tremendously contributed towards the integration of Web 2.0 technologies in the teaching and learning process. A study by Mirriahi *et al.* (2012) shows that professional social network of instructors tend to include colleagues with whom they have positive rapport on the use of technology. On the other hand, Kim *et al.* (2009) observed that the community (people of the same profession) subscribe to and create their profile to identify and promote themselves and the rest of the community. Through these communities they promote professional networks which influence their usage of technology. For example, popular social networks such as LinkedIn, Facebook and MySpace can help different communities such as those of academicians and students promote the usage of technology. Uimonen (2012)

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observes that the users of social media pages post and share information as well as direct their friends to blogs, thus using one social medium to promote the use of another social medium through remediation. Thus they create social influence towards the adoption and use of new technologies such as Web 2.0 tools in the teaching and learning process.

In addition, the management of universities has a big role to play in motivating staff members to adopt new technologies in the teaching and learning. If the management instructs staff members to use ICT and related technologies in teaching and learning, then it is possible for such staff members to integrate it in their teaching. It should be noted that the management of a university is responsible for formulating and implementing policies that require staff members and students to adopt modern technology in teaching and learning. They are also responsible for the acquisition of modern teaching facilities in their respective universities. Buabeng-Andoh (2012) believes that leaders who implement technology plans and also share a common vision with teachers inspire them to apply such novel technology in their lessons. Conversely, the majority of the faculty members and students indicated that the integration of Web 2.0 technologies is inevitable in the current teaching and learning environment of universities. Indeed, there are technological changes taking place in the world now being applied in teaching and learning. The technologies adopted and deployed in teaching and learning activities are ICT-related technologies such as Web 2.0 tools that have tremendously changed the teaching and learning environment in most of the universities in the country and elsewhere in the world. Other e-learning technologies used for delivering learning content online to any person who wants to take a course, with no limit on attendance, are Moodle (Learning Management System - LMS), mobile technology, and Massive Open Online Courses (MOOCs).

### ***Factors Influencing the Integration of Web 2.0 Technologies in Teaching and Learning***

There are many factors influencing the integration of Web 2.0 technologies in teaching and learning activities (Armstrong & Franklin, 2008). Such factors include familiarity with the technology, which generally plays a crucial role in adopting such tools. The study findings show that academic staff and students agreed that unfamiliarity with Web 2.0 technologies influence the integration of these tools in teaching and learning; so they were of the opinion that training on the use of the Web 2.0 tools would enhance people's familiarity with Web 2.0 tools and their application in teaching and learning. On the whole, there was a general consensus that attending training helped the trainees to understand and apply the knowledge gained, in real life situations.

Findings indicate that staff members and students see expertise and ease of use of technology as factors that influence the use of Web 2.0 technologies. Long (2010) and Kazoka and Mwantimwa (2019) assert that enabling technology use depends on the ease of use by the user. The findings suggest that a large portion of staff members and students agreed that ease of use of Web 2.0 technologies as platforms has a bearing on the integration of such tools in the teaching and learning process. In this regard, Echeng and Usoro (2014) and Brodahl, Hadjerrouit, and Hansen, (2011) also declare that Web 2.0 technologies encourage mass participation and provide an architecture (ease of use, handy tools) that lowers the barriers to participation. In addition, attitude towards technology as a platform for teaching and learning has influence on its usage. Some scholars such as Buabeng-Andoh (2012) and Gaffer, Singh, Thomas (2011) affirm that personal attitude and perception towards the technology are important indicators of acceptance and subsequent use of any technology.

The findings further indicate that support from the university management influences the integration of the Web 2.0 tools in the teaching and learning process. The university management is responsible for the installation of ICT infrastructures, formulation and implementation of ICT



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and e-learning policies, the availability of ICT tools, internet connectivity, employing ICT experts and conducting of regular training to equip staff members with the necessary skills on the use of ICT and other emerging technologies in teaching and learning. These are called facilitating conditions, according to Venkatesh *et al.*'s (2003) theory of UTAUT. In addition, the findings show that the majority of faculty members and students agreed that getting technical support is critical in the integration of Web 2.0 tools in teaching and learning in universities. Some studies (see Armstrong & Franklin, 2008) indicate that the provision of support to instructors who are already motivated to engage in new approaches to teaching and learning remains a challenge to fostering technology-based learning or any e-learning platform based on Web 2.0 technologies on college or university campuses. This anomaly is partially attributed to lack of technical assistance to staff members and students. It should also be noted that getting technical support on the use of Web 2.0 technologies is vital in the integration of such tools in the teaching and learning process.

Characteristically, support from university management is vital in the smooth introduction and implementation of any new and innovative technologies in teaching and learning activities. Such support includes technical support, especially from the ICT experts, motivation of staff members and students, employing ICT experts to assist faculty members from all technical issues, acquisition of modern computers, and having a reliable power supply for sustainable use of the Web 2.0 tools in the teaching and learning. Buabeng-Andoh (2012) warns that without ample technical support for teachers, they become frustrated and, hence, their unwillingness to use ICT. Some studies (see, for example, Korte & Husing, 2007 as cited by Buabeng-Andoh 2012) in countries such as Britain and the Netherlands have appreciated the significance of technical support in helping teachers to integrate technology in their teaching. Indeed, such technical support in schools will encourage staff to apply ICT in the classroom without wasting time with troubleshooting hardware and sorting out software problems.

Web 2.0 technologies have features through which users can share information and ideas. The findings show that staff members and students confirm that the habit of sharing information and content influences the use of Web 2.0 technologies in the teaching and learning process. A study carried out by Uimonen (2012) found that Facebook as part of Web 2.0 technologies is the most popular platform among young Tanzanians; it is mostly used for social communication and sharing of information among individuals and organisations. They prefer this web platform because it helps them to make friends and exchange ideas with other people. Moreover, it is easy to use and constitutes a cheap means of communication and sharing thoughts. In this regard, once properly guided and trained to use this in teaching and learning purposes, staff and students can share educational information in the course of teaching and learning instead of students using the tools mostly for social communication.

## **Conclusion**

It was evident from the findings that there are many factors influencing integration of technologies in teaching and learning activities. It was established that familiarity and attitude towards the technologies greatly influence its usage. Furthermore, support from the university management is crucial for proper and smooth application of technologies such as Web 2.0 technologies in teaching and learning. Availability of reliable ICT infrastructure and fast internet connectivity, establishment of ICT and E-learning policies and availability of ICT tools such as Factors Influencing Pedagogical Activities in Web 2.0 Technologies Integration: A Case of Three Universities in Tanzania

computers connected to the Internet for use by staff members and students were identified as factors that influenced the integration of Web 2.0 technologies in the teaching and learning process.

### Recommendations

University management should foster awareness creation and provide technical support on proper design and use of Web 2.0 technologies in teaching and learning activities. Furthermore, there is a need for improving ICT infrastructure in universities for smooth use of Web 2.0 technologies and other emerging technologies which are viable for learning activities. There is a need to conduct regular seminars and workshops for staff members, and provide support to staff and students for proper integration of Web 2.0 technologies in the teaching and learning process. Through training, staff members and students will have the opportunity to acquire a deep understanding and knowledge of how to properly utilise Web 2.0 tools and other emerging technologies in the teaching and learning process.

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