ARTICLE

TEACHING WITH WEB 2.0 TECHNOLOGIES IN SELECTED FEDERAL UNIVERSITIES IN SOUTH WEST NIGERIA

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ABSTRACT

The purpose of the study reported on in this article was to investigate the extent of use of Web 2.0 for teaching purposes in selected federal universities in South West Nigeria. The study addressed two research objectives, namely: (1) to examine the extent to which Web 2.0 technologies are integrated into teaching in the selected federal universities; and (2) to investigate the factors influencing the use of Web 2.0 technologies for teaching purposes. The study was guided by the updated DeLone and McLean (D&M) Model of Information Systems Success. The population of the study comprised 240 academics from the faculties of technology, sciences and veterinary. A response rate of 195 (81.3%) was achieved. The results revealed that the uptake of Web 2.0 for teaching purposes in Nigerian universities is low but seems to be growing. Moreover, system quality, information quality and service quality were three major variables that influenced technology adoption and use by academic staff. The study recommends that the universities in South West Nigeria should focus more on Web 2.0 infrastructure development; create enabling policies; improve academic staff attitudes towards the use of technologies for teaching purposes; and develop capacity.

Keywords: Web 2.0; teaching; instruction media; e-learning; universities; Nigeria

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1. INTRODUCTION

Web 2.0 technologies are dynamic internet applications (Aharony 2008) that allow users to communicate with one another by creating, editing and sharing information. These technologies typically include blogs, forums, wikis, micro-messaging, cloud computing, RSS feeds, social networking sites (SNSs), multimedia sharing, social bookmarking, podcasts and more (Baro, Ebiagbe and Godfrey 2013). The Web 2.0 is different from the earlier Web 1.0 which was characterised as "read only web" (Drachsler, Hummel and Koper 2008). Web 2.0 is a "read-write web" (Mohammad 2011) which allows users to do more than just retrieve information, that is, to add, share or modify information. Web 2.0 collectively represents the social web which represents the online tools that facilitate collaboration, communication, and interactivity (Groff 2013).

Web 2.0 technologies are increasingly being used to enrich learning environments by enhancing collaboration, communication and interaction among learners and their peers (Narayan and Baglow 2010). In North America and Europe, Web 2.0 technologies are used as key components in achieving a richer teaching experience and are also used to communicate and deliver needed information such as course outlines, questions and solutions to assignment and tests, audio or visual instructional materials to students (Kumar 2008). In a study at Tallinn University in Estonia, Virkus (2008) demonstrated that some academics had successfully adopted Web 2.0 in supporting face-to-face lectures and online learning.

As in the developed world, developing countries are striving to adopt various learning technologies (Lwoga 2012). Gupta, Singh and Marwaha (2013) have pointed out that in the context of India, Web 2.0 has made distance learning more analytical, flexible, interactive and collaborative for both teachers and students. Okello-Obura and Ssekitto (2015) in a study among academics at Makerere University in Uganda, noted that Web 2.0 was being used to disseminate information to students; provide online distance learning; create learning materials; and assess students.

In spite of the increasing use of Web 2.0 to support teaching, the actual usage of these technologies is quite low in Africa, especially in countries such as Ghana, Tanzania, and Nigeria (Lwoga 2012; Munguatosha, Muyinda and Lubega 2011). However, Lwoga (2012) further asserts that the situation is not the same throughout Africa, as some South African universities have adopted a high use of e-learning.

2. PROBLEM STATEMENT

This study sought to investigate the extent of use of Web 2.0 by academics for teaching purposes in federal universities in South West Nigeria. The study was motivated by the fact that whilst the the use of Web 2.0 in Nigerian universities is increasing, the focus seems to be on librarians and information professionals (Baro, Ebiagbe and Godfrey 2013; Onuoha 2013). While many universities around the world are using Web 2.0 for teaching purposes (Hramaik and Boulton 2013), most Nigerian universities are still

battling with some challenges that affect the effective integration of Web 2.0 into the classroom. Similarly, there is a dearth of research on the use of Web 2.0 among academics in Nigeria (Diyaolu and Rifqah 2015). Echeng, Usoro and Majewski (2013) point out that many universities in Nigeria are yet to effectively espouse Web 2.0 particularly for teaching purposes. The reasons for the limited adoption of Web 2.0 by Nigerian universities have not been clearly researched and understood. However, anecdotal evidence seems to suggest low awareness; lack of recognition of the importance of Web 2.0; paucity of technical support; poor ICT infrastructure; erratic power supply; and slow technology acceptance culture (Echeng, Usoro and Majewski 2013).

3. OBJECTIVES OF THE STUDY

The study addressed the following research objectives:

1. to examine the extent to which Web 2.0 technologies are integrated into teaching in the selected federal universities in South West Nigeria;
2. to investigate the factors influencing the use of Web 2.0 technologies for teaching purposes in federal universities in South West Nigeria.

4. RESEARCH QUESTIONS

The following research questions were addressed:

1. To what extent are Web 2.0 technologies integrated into teaching and learning in Nigerian universities?
2. Which factors influence the use of Web 2.0 technologies for teaching?

5. THEORETICAL FRAMEWORK

The study was guided by the updated DeLone and McLean (D&M) Model of Information Systems Success (DeLone and McLean 2003). This theoretical model has been employed in various studies to understand the concept of adoption, use, acceptance and success of information systems (IS) (Edlund and Lövquist 2012; Onyedimekwu and Oruan 2013; Phan and Daim 2011).

The D&M Model posits that the success of information and communication technologies (ICTs) depend on several interrelated factors, including information quality, system quality and service quality, (intention to) use, user satisfaction, and net benefits (DeLone and McLean 2003). Dwivedi, Kapoor, Williams and Williams (2013) reported that the D&M Model is one of the most established and frequently utilised theories that facilitate the examination of success and user satisfaction of an IS.

Therefore, the study modelled academics' experience with the use of Web 2.0 by applying the following variables from the D&M Model: system quality; information quality; service quality; attitude; use/intention to use; and net benefits.

5.1. System quality

System quality generally refers to how good a system is. System quality is considered as a multidimensional construct (Bhatti, Baile and Yasin 2011) because it provides an explanation for the usability and performance characteristics of a system (Urbach and Müller 2011). In the Web 2.0 environment, system quality is the anticipated features of Web 2.0 that will positively influence users' attitude and use/intention to use the system (Lwoga 2013; Trkman and Trkman 2009). Based on this variable, the study tested the null hypothesis: **H1: There is no significant relationship between system quality and attitude towards use of Web 2.0 for teaching purposes.**

5.2. Information quality

Information quality refers to the desirable characteristics of the output of an IS which will positively influence its use (Okechi and Kepeghom 2013; Urbach and Müller 2012). In the context of the current study, information quality refers to the quality of teaching resources and content delivered through the use of Web 2.0. Thus, the study tested hypothesis 2: **H2: There is no significant relationship between information quality and attitude towards use of Web 2.0 or teaching purposes.**

5.3. Service quality

Service quality is the desirable characteristics of the output of technologies, such as Web 2.0, which will positively influence their adoption and use (Dwivedi et al. 2013). Service quality in the study is considered to be the overall support rendered by the Web 2.0 service provider or support given to the academics in the Web 2.0 environment. Some popular measures of service quality include accuracy, reliability, prompt responsiveness of the support team, availability of support services when needed, technical competence, and empathy of the personnel staff (Makokha 2011). Thus, the study tested hypothesis 3: **H3: There is no significant relationship between service quality and attitude towards use of Web 2.0 for teaching purposes.**

5.4. Attitude towards use

Galy, Downey and Johnson (2011) describe attitude towards behaviour as either favourable or positive evaluation or unfavourable or negative evaluation of performing the behaviour. Attitude may also be explained as an inward way of communicating one's perception of behaviour although expressed through actions and inactions. Attitude in

the study was used to examine the extent to which academics and students possess positive feelings about using Web 2.0 for teaching and learning purposes, respectively. Thus, the study tested hypothesis 4: **H4: There is no significant relationship between attitude towards use and intention to use Web 2.0 for teaching purposes.**

Based on these hypotheses, the conceptual model in Figure 1 was developed.

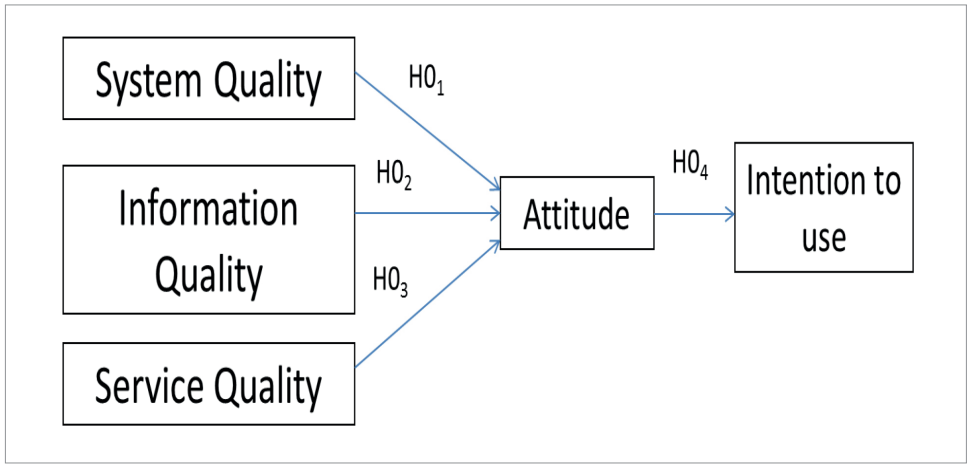

Figure 1: Conceptual framework for the use of Web 2.0 for teaching purposes

6. METHOD

The method consisted of a survey research design using structured questionnaires to obtain quantitative data from academics about their opinions, attitudes, feelings and experiences with the use of Web 2.0 technologies for teaching purposes. Two federal universities, the University of Ibadan (UI) and the Federal University of Agriculture, Abeokuta (FUNAAB) in the South West geo-political zone of Nigeria were purposively selected for the study. A total of 240 academics from the technology, sciences and veterinary faculties were selected to participate in the survey from which 195 copies of the questionnaire were duly completed and returned, giving a response rate of 81.3 per cent. The data collection instruments were pre-tested to confirm the clarity of questions and thereafter Cronbach's alpha (α) was used to help establish reliability and the internal validity of the questions. The data was analysed using descriptive statistics. Regression analysis was used to determine the strength of the relationship between the constructs. The hypotheses were tested at a 0.05 level of significance. The study complied with the research ethics protocol of the University of KwaZulu-Natal, UI and FUNAAB.

The questionnaire consisted of four sections, namely: Section A collected general information on the respondents regarding their demographic characteristics, including: name of university, faculty, gender, age category, educational qualification and years of

experience with Web 2.0. Section B gathered data on the academics' use of Web 2.0 for teaching purposes and their frequency of use. A 5-point Likert scale was used for the questions ranging from 0–4 with 0 = Never, 1 = Rarely, 2 = Occasionally, 3 = Frequently and 4 = Very frequently. Section C collected data on system, information and service quality, in order to test their influence on attitude towards use of Web 2.0 technologies for teaching. Sections D and E elicited responses that aided understanding on how attitude towards use influenced intention to use Web 2.0 technologies for teaching purposes. The questions for sections C to E were close-ended, and required the respondents to rate their responses on a 5-point Likert scale ranging from 0–4 with 0 = Undecided, 1 = Strongly agree, 2 = Agree, 3 = Disagree and 4 = Strongly disagree.

7. FINDINGS AND DISCUSSION

The findings are organised under the following headings: background information; extent of Web 2.0 integration in teaching and learning in Nigerian universities; and factors influencing use of Web 2.0 for teaching purposes.

7.1. Background information

The findings indicated that 71 per cent of the respondents were from UI while 29 per cent were from FUNAAB; 73 per cent were male, while 27 per cent were female; 39 per cent were within the age bracket 41–50 years, 36 per cent between 31–40 years, 13 per cent below 30 years, 10 per cent between 50–60 years and 3 per cent were 60 years and above. The highest population (39%) of the respondents was in the age range of 41–50 years and the least (3%) in the category of 60 years and above. The findings on educational qualification showed that 52 per cent of them had doctoral degrees, 37 per cent had master's degrees, while 11 per cent had other degrees or did not indicate their qualification. The findings indicated that the majority of academics who participated in the study had a PhD. It can be inferred from the findings that an average academic staff member from the universities surveyed (especially those above 40 years) was likely to hold a PhD. This finding corroborates Ani's (2013) finding that most academic staff (71.3%) in the Nigerian universities possess a PhD. These findings are consistent with international practice requiring academics applying for teaching posts to possess a PhD (Ameen and Ullah 2013).

7.2. Extent of Web 2.0 integration in teaching and learning

The findings presented in Table 1 indicate that SNSs (63%) were by far the most used Web 2.0 applications for teaching, followed by Wikipedia (57%), instant messaging (43%), YouTube (41%) and Skype (30%). Among the SNSs, Facebook (40%), WhatsApp (37%) and LinkedIn (29%) received higher responses for use in teaching.

Table 1: Academics' use of Web 2.0 technologies for teaching purposes

Web 2.0	Frequency	Percentage (%))
Blogs	41	21.0
Instant messaging	83	42.6
Newsgroups/Online forums	46	23.6
Podcasts/Webcasts/Vodcasts	14	7.2
RSS feeds	17	8.7
Skype	58	29.7
SNSs	123	63.1
Facebook	78	40.0
MySpace	6	3.1
Twitter	32	16.4
WhatsApp	72	36.9
2go	11	5.6
Flickr	4	2.1
Badoo	7	3.6
Bebo	1	0.5
LinkedIn	57	29.2
Social bookmarking	3	3.2
E-Portfolios	9	11.7
YouTube	80	41.0
Teacher Tube	6	3.1
Wikis	112	57.4
Wikipedia	111	56.9
Wiki-how	16	8.2
Others (Please specify)	9	4.6

The findings identified SNSs as the most widely used Web 2.0 applications for teaching purposes. The study revealed a high use (up to 63%) of Facebook, WhatsApp, LinkedIn, Wikipedia, instant messaging, YouTube and Skype, for teaching purposes in the surveyed universities. These findings seem to agree with those of Ajise and Fagbola (2013) who found that academics in Nigerian universities mostly used Web 2.0 for teaching purposes. Okereke (2014) in a survey on the use of social media in teaching by academics in South East Nigeria, found that academics mostly used Facebook (50 =

86.20%) and blogs (8 = 12.06%) for teaching purposes. It was also found that academics (up to 24%) similarly used newsgroups or online forums and blogs for teaching purposes. The minimal use of these technologies may be attributed to the lack of awareness, familiarity, interest, necessary skills, and unavailability of resources or facilities. Majhi and Maharana (2011) in a study among academics, students and researchers at Utkal and Sambalpur Universities in India, observed that academics lacked the necessary knowledge and skills to use some Web 2.0 applications, such as RSS feeds, blogs, and social bookmarking for teaching purposes. This finding also corroborates those of Azab, Abdelsalam and Gamal (2013) and Chawinga (2014) who found that academics rarely used these technologis for teaching purposes.

The study findings further revealed that instant messaging, Wikipedia, WhatsApp, YouTube, LinkedIn and Facebook were frequently used (Hassan, Khan and Lalitha 2016, 260), while Skype was occasionally for teaching purposes. However, up to 98 per cent of the academics had never used social bookmarking, Bebo, Teachertube, Flickr, Badoo, E-portfolio, MySpace, 2go, podcasts/webcasts/vodcasts, Wiki-how, RSS feeds, Twitter and blogs for teaching purposes in the previous three months. This finding may suggest that the academics did not accept these particular Web 2.0 technologies, which concurs with Ajjan and Hartshorne's (2008) finding that faculty had low intention to adopt Web 2.0 technologies for teaching at Florida State University in the United States where 55, 62.2, 74 and 80 per cent of academics had never used wikis, blogs, social networking and social bookmarking, respectively. The findings generally suggest that that more academics are using SNSs, although such use is limited to a few specific applications from the many Web 2.0 technologies available.

7.3. Factors influencing the use of Web 2.0 for teaching purposes

System quality, information quality and service quality variables in the D&M Model were found to be the three major variables impacting IS success. Lwoga (2013) found that the quality factors did influence attitude and behaviour of academics (specifically librarians) towards the use of Web 2.0. The findings in the current study revealed that the majority of academics (up to 89%) strongly agreed or agreed that they found Web 2.0 easy to use; easy to collaborate with colleagues; reliable and useful for teaching; and helped to accomplish teaching tasks more quickly. Notably, the responses from the majority of the respondents suggested that all the measures of system quality would have positive influence on use of Web 2.0 for teaching purposes. Surprisingly, the findings from the regression analysis revealed that the system quality variable in the D&M Model had no significant influence on users' attitude towards the use of Web 2.0 for teaching purposes. This is in sharp contrast with previous studies (Dwivedi et al. 2013; Lwoga 2013; Makokha and Ochieng 2014; Urbach and Müller 2012) which found that system quality positively influenced users' attitude towards use or intention to use the system. Petter, DeLone and McLean (2008) found that system quality in the D&M Model had

significant effects on system use in an analytical study of 18 different studies that used system quality construct. Dwivedi et al. (2013) in another study in the United Kingdom reported a significant influence of system quality ($\beta = 0.328$; $p = 0.000$) on actual use of RFID integrated systems. Kapoor, Dwivedi and Lal (2013) also concurred that a higher system quality would attract greater positive users' intention and use.

In other related studies, Moon and Kim (2001) and Olatokun and Owoeye (2012) found a significant effect of system quality, perceived ease of use and perceived usefulness on users' attitude towards online technology usage. Ajjan and Hartshorne (2008) and Hartshorne and Ajjan (2009) also found that ease of use, usefulness, and compatibility (dimensions of system quality) were major determining factors of academics and students' attitude towards the use of Web 2.0 technologies. However, the present finding on the insignificance of system quality on users' attitude corroborates the finding of Zhang (2010) who observed that although information quality played a significant role in developing sense of community which could enhance the use of social networks, system quality did not. Manochehri and Sharif's (2010) investigation on the influence of classroom technology on student's learning attitude in a Qatar university showed that ease of use (another measure of system quality) at an initial stage of technology use did not lead to increase in their use in the classroom. This variability in results on system quality could be as a result of the different context, theories, population, methodology, locations and groups of people considered in the studies.

The findings showed that most academics concurred that information quality had a positive influence on the use of Web 2.0 for teaching purposes. For instance, the majority of academics (up to 87%) strongly agreed or agreed that Web 2.0 made it easy for them to prepare teaching materials; provided them with sufficient information for teaching; provided meaningful and up-to-date information; allowed information to be accurately presented; and enabled timely transfer and reception of information. The extant literature revealed that service quality and information quality variables of the D&M Model are important factors in delivering technology-based services to users (Cheng 2012; Demirci and Kara 2014; Kallweit, Spreer and Toporowski 2014; Lee and Yang 2013). Previous studies, such as those by Petter and McLean (2009), Halonen, Acton, Golden and Conboy (2009), Masrek, Jamaludin and Mukhtar (2010), Urbach and Müller (2012), Cheng (2012) and Lwoga (2013) revealed that information quality had significant positive impacts on perceived usefulness and use and user satisfaction. Zheng, Zhao and Stylianou (2013) in an investigation on the influence of information quality and system quality on users' continuance intention to participate in "Virtual communities" found that user satisfaction ($R^2 = 69.6\%$) essentially depended on information quality, system quality and individual benefits. Evidently, IS and Web 2.0 with good service quality and information quality will attract favourable attitude from users. Though the effect of information quality on the attitude towards use of IS was not considered in many of the previous studies, the findings of the current study showed that information quality and service quality had considerable influence on academics'

attitude to use of Web 2.0 technologies, particularly for teaching purposes. This result is perhaps due to the benefits that can be derived from the use of Web 2.0 such as Wikipedia, Facebook and YouTube in education. This could also be attributed to the popularity of the technologies as they were found to be more commonly used by academics than some other Web 2.0 technologies. This affirmed the findings of Olatokun and Owoeye (2012), Zheng, Zhao and Stylianou (2013), Lwoga (2013) and Ellahi and Bokhari (2013) that service quality and information quality are important predictors of attitude to using technologies. Therefore, it can be inferred that the quality of information existing or generated by Web 2.0 technologies is an important determinant of attitude towards their use for teaching purposes.

The findings in respect of service quality confirmed the findings of Olatokun and Owoeye (2012) and Lwoga (2014) on the significance of service quality constructs on users attitude. They found that technical guidance and support (one of the matrix for measuring service quality) enhanced service quality and students' technology acceptance (Hartshorne and Ajjan 2009; Lwoga 2014). The findings on service quality also showed that the majority of the academics (between 60 and 85%) strongly agreed or agreed that Web 2.0 provide reliable and prompt support for teaching. This finding may suggest that academics have developed a strong interest in the use of Web 2.0 for teaching purposes. Lwoga (2013) emphasises the key role service quality plays on users' usage intention by revealing that service quality (among other qualities such as information quality and system quality) had the strongest effect on intention to reuse Library 2.0 among undergraduate university students in Tanzania. Makokha and Ochieng (2014) in a study in Kenya found that service quality has a significant impact on use and user satisfaction. Further findings from Ramayah and Lee (2012) showed the positive impact of service quality ($\beta = 0.30$, $p < 0.01$) on continuance intention to use the e-learning systems in Malaysia. Thus, it can be deduced from the findings that the more users gain understanding and support on the use of Web 2.0, the more they develop a positive attitude towards using these technologies.

The findings on academics' attitude of intention to use Web 2.0 showed that their attitude significantly ($p < 0.05$) influenced their intention to use Web 2.0 for teaching purposes. The relationship was also positive with the majority of academics (between 66% and 87%) in the surveyed universities conceding that they enjoyed using Web 2.0 for teaching purposes. Attitude accounted for only 25.7 per cent of the total variance on academics' intention to use Web 2.0 for teaching purposes. These results suggest that most of the academics had a positive attitude towards the use of Web 2.0 for teaching purposes, while a few of them did not support the use of Web 2.0 for teaching purposes. Ajjan and Hartshorne's (2008) study found that attitude plays a substantial role in influencing the academics' interest in adopting Web 2.0 technologies. Chiou (2011) also substantiated the current findings that attitude towards use of computer (one of the devices used to access Web 2.0) is a critical factor that predicts academics' use of Web 2.0. Furthermore, in Castillo's (2014) descriptive survey, academics' attitude

was found to strongly and positively influence (β = 0.626) the behavioural intention of academics to use Web 2.0 in delivering instructions. Thus, the findings of the current study validate those of previous studies that attitude would strongly predict the future use of technologies such as Web 2.0 especially for teaching purposes.

The results of the hypotheses tested helped to establish how the independent variables in the study influenced the use of Web 2.0 technologies by academics for teaching purposes. The results of the regression analysis carried out revealed that service quality (β = 0.305, $p < 0.05$) and information quality (β = 0.224, $p < 0.05$) significantly contributed to academics' attitude towards use of Web 2.0 technologies for teaching purposes, while the relationship between system quality and attitude towards use was not significant ($p > 0.05$). The results also revealed that attitude towards use (β = 0.511, $p < 0.05$) significantly and positively contributed to academics' intention to use Web 2.0 for teaching purposes while attitude towards use accounted for only 25.7 per cent variation on academics' intention to use Web 2.0 for teaching purposes (Adjusted R^2 = 0.257). Therefore, hypotheses H2, H3 and H4 are rejected, while H1 is accepted.

In summary, the study findings revealed that system quality did not significantly ($p > 0.05$) influence academics' attitude towards the use of Web 2.0 technologies for teaching purposes, while information quality and service quality had a positive significant relationship with attitude towards use of Web 2.0 for teaching purposes. The findings suggest that factors such as information quality and service quality are responsible for influencing academics' attitude towards the use of Web 2.0 technologies for teaching purposes. Based on the findings of the current study, which also suggest that "attitude towards use" is a significant factor, it would be a good idea to extend the D&M Model with "attitude towards use" as a variable. Besides, system quality in the D&M Model may be disregarded when independently examining the influence of the three quality factors of the model on attitude towards use of Web 2.0.

8. SUMMARY AND CONCLUSION

The study sought to investigate the extent of use of Web 2.0 for teaching purposes in federal universities in South West Nigeria by addressing two research objectives, namely: (1) to examine the extent to which Web 2.0 technologies are integrated into teaching in the selected federal universities; and (2) to investigate the factors influencing the use of Web 2.0 technologies for teaching. The results revealed that the uptake of Web 2.0, especially SNSs, for teaching purposes by academics in Nigerian universities is low but seems to be growing, with some Web 2.0 technologies being used more than others. Moreover, the study found that quality factors of information quality and system quality significantly influenced attitude towards the use of Web 2.0 for teaching purposes. However, system quality was found not to influence attitude to the use of Web 2.0. This implies that academics' attitude towards the use of Web 2.0 may not be affected by ease of use or how reliable the technologies are. Furthermore, a significant

positive relationship was found to exist between attitude and intention to use Web 2.0 for teaching purposes.

Thus, on the whole, the study revealed a strong enthusiasm among academics towards use of Web 2.0 for teaching purposes. However, for effective integration of these technologies into teaching to happen, there is a need for university authorities to create awareness on the different types of Web 2.0 technologies for teaching purposes and also make provision for institutional policy on the integration of Web 2.0 in teaching and learning activities. In addition, instruction media infrastructure development, capacity building plans, and financial resources to institutionalise use of Web 2.0 for teaching purposes is needed. The enabling policies would, for example, aim at ensuring that academics uploaded their course outlines, lecture notes and other relevant materials onto designated and authorised websites where students could easily assess such using Web 2.0. Similarly, such policies would ensure the responsible use of Web 2.0 technologies.

REFERENCES

Aharony, N. 2008. "Web 2.0 in US LIS Schools: Are They Missing the Boat?" http://www.ariadne.ac.uk/issue54/aharony/ (accessed May 2, 2014).

Ajise, B., and O. Fagbola. 2013. "Awareness and Usage of Web 2.0 Tools Among Lecturers in Nigerian Universities: Implications for Teaching and Learning in Schools." *Nigerian School Library Journal* 12. http://www.ajol.info/index.php/nslj/article/view/97455 (accessed March 24, 2014).

Ajjan, H., and R. Hartshorne. 2008. "Investigating Faculty Decisions to Adopt Web 2.0 Technologies: Theory and Empirical Tests." *The Internet and Higher Education* 11 (2): 71–80.

Ameen, K., and M. Ullah. 2013. "Challenges of Getting Faculty Status: Perception of University Librarians in Pakistan." *International Information and Library Review* 45 (1): 83–91.

Ani, O. E. 2013. "Accessibility and Utilization of Electronic Information Resources for Research and Its Effect on Productivity of Academic Staff in Selected Nigerian Universities Between 2005 and 2012." Doctoral thesis, University of South Africa.

Azab, N., H. M. Abdelsalam, and S. Gamal. 2013. "Use of Web 2.0 Collaboration Technologies in Egyptian Public Universities: An Exploratory Study." In *E-Government Implementation and Practice in Developing Countries*, edited by Z. Mahmood, 99–127. Hershey: IGI Global.

Baro, E. E., E. J. Ebiagbe, and V. Z. Godfrey. 2013. "Web 2.0 Tools Usage: A Comparative Study of Librarians in University Libraries in Nigeria and South Africa." *Library Hi Tech News* 30 (5): 10–20.

Bhatti, Z., S. Baile, and H. Yasin. 2011. *The Success of Corporate Wiki Systems: An End User Perspective*. Mountain View: Association for Computing Machinery.

Castillo, C. M. 2014. "Faculty Behavioral Intention to Adopt Web 2.0 Technologies: A Path Analysis." *UIC Research Journal* 18 (2): 187–209.

Chawinga, W. D. K. 2014. "The Use of Web 2.0 by Students and Lecturers at Mzuzu University, Malawi: The Case of the Faculty of Information Science and Communications." E-thesis. http://etd.uwc.ac.za/xmlui/handle/11394/4113 (accessed May 12, 2015).

Cheng, Y. M. 2012. "Effects of Quality Antecedents on E-Learning Acceptance." *Internet Research* 22 (3): 361–390.

Chiou, Y. 2011. "Perceived Usefulness, Perceived Ease of Use, Computer Attitude, and Using Experience of Web 2.0 Applications as Predictors of Intent to Use Web 2.0 by Pre-Service Teachers for Teaching." PhD thesis, Ohio University. https://etd.ohiolink.edu/ (accessed October 20, 2014).

DeLone, W. H., and E. R. McLean. 2003. "The DeLone and McLean Model of Information Systems Success: A Ten-Year Update." *Journal of Management Information Systems* 19 (4): 9–30.

Demirci, O., and A. Kara. 2014. "Supermarket Self-Checkout Service Quality, Customer Satisfaction, and Loyalty: Empirical Evidence from an Emerging Market." *Journal of Retailing and Consumer Services* 21 (2): 118–129.

Diyaolu, A. M., and O. O. Rifqah. 2015. "Investigating the Educational Use of Web 2.0 Among Undergraduates in Nigerian Private Universities." *Journal of Library and Information Science* 6 (1): 69–97.

Drachsler, H., H. Hummel, and R. Koper. 2008. "Personal Recommender Systems for Learners in Lifelong Learning Networks: Requirements, Techniques and Model." *International Journal of Learning Technology* 3 (4): 404–423.

Dwivedi, Y. K., K. K. Kapoor, M. D. Williams, and J. Williams. 2013. "RFID Systems in Libraries: An Empirical Examination of Factors Affecting System Use and User Satisfaction." *International Journal of Information Management* 33 (2): 367–377.

Echeng, R., A. Usoro, and G. Majewski. 2013. "Acceptance of Web 2.0 in Learning in Nigerian Higher Education: A Pilot Study." *Computing and Information Systems* 17 (1): 1–7.

Edlund, S., and A. Lövquist. 2012. "The Role of System Administrators in Information Systems Success." Master's thesis, Uppsala University. http://www.diva-portal.org/smash/get/diva2:534363/FULLTEXT01.pdf (accessed April 16, 2014).

Ellahi, A., and R. H. Bokhari. 2013. "Key Quality Factors Affecting Users' Perception of Social Networking Websites." *Journal of Retailing and Consumer Services* 20 (1): 120–129.

Galy, E., C. Downey, and J. Johnson. 2011. "The Effect of Using E-Learning Tools in Online and Campus-Based Classrooms on Student Performance." *Journal of Information Technology Education* 10: 209–230.

Groff, J. 2013. "Technology-Rich Innovative Learning Environments." *Innovative Learning Environments* 1: 1–30.

Gupta, P., B. Singh, and T. Marwaha. 2013. "Relationship Between Social Media and Academic Performance in Distance Education." *Universal Journal of Educational Research* 1 (3): 185–190.

Halonen, R., T. Acton, W. Golden, and K. Conboy. 2009. "DeLone & McLean Success Model as a Descriptive Tool in Evaluating the Use of a Virtual Learning Environment." Paper presented at the International Conference on Organizational Learning, Knowledge and Capabilities (OLKC 2009), Amsterdam.

Hartshorne, R., and H. Ajjan. 2009. "Examining Student Decisions to Adopt Web 2.0 Technologies: Theory and Empirical Tests." *Journal of Computing in Higher Education* 21 (3): 183–198.

Hassan, I. M., H. U. Khan, and V. M. Lalitha. 2016. "Pedagogical Potentials of IEEE 802.11 WLAN to Nigerian Universities: A Case Study of the University of Uyo." *International Journal of Information and Education Technology* 6 (4): 256–261.

Hramiak, A., and H. Boulton. 2013. "Escalating the Use of Web 2.0 Technology in Secondary Schools in the United Kingdom: Barriers and Enablers Beyond Teacher Training." *Electronic Journal of E-Learning* 11 (2): 91–100.

Kallweit, K., P. Spreer, and W. Toporowski. 2014. "Why Do Customers Use Self-Service Information Technologies in Retail? The Mediating Effect of Perceived Service Quality." *Journal of Retailing and Consumer Services* 21 (3): 268–276.

Kapoor, K. K., Y. K Dwivedi, and B. Lal. 2013. "RFID Systems in Libraries: Extending the TAM Model for Empirically Examining the Use." European, Mediterranean and Middle Eastern Conference on Information Systems 2013 (EMCIS2013), Windsor, October 17–18.

Kumar, S. 2008. "Undergraduate Perceptions of the Usefulness of Web 2.0 in Higher Education: Survey Development." http://plaza.ufl.edu/swapnak/ecel09Kumar.pdf (accessed April 14, 2014).

Lee, H., and K. Yang. 2013. "Interpersonal Service Quality, Self-Service Technology (SST) Service Quality, and Retail Patronage." *Journal of Retailing and Consumer Services* 20 (1): 51–57.

Lwoga, E. T. 2012. "Making Learning and Web 2.0 Technologies Work for Higher Learning Institutions in Africa." *Campus-Wide Information Systems* 29 (2): 90–107.

Lwoga, E. T. 2013. "Measuring the Success of Library 2.0 Technologies in the African Context." *Campus-Wide Information Systems* 30 (4): 288–307.

Lwoga, E. T. 2014. "Critical Success Factors for Adoption of Web-Based Learning Management Systems in Tanzania." *International Journal of Education and Development Using Information and Communication Technology* 10 (1): 4–21.

Majhi, S., and B. Maharana. 2011. "Familiarity of Web 2.0 and Its Application in Learning: A Case Study of Two Indian Universities." *International Journal of Library and Information Science* 3 (6): 120–129.

Makokha, M. W. 2011. "Assessing the success of ICT's from a User Perspective: A Case of Coffee Research Foundation." PhD thesis, University of Nairobi.

Makokha, M. W., and D. O. Ochieng. 2014. "Assessing the Success of ICT's from a User Perspective: Case Study of Coffee Research Foundation, Kenya." *Journal of Management and Strategy* 5 (4): 46–53.

Manochehri, N., and K. Sharif. 2010. "A Model-Based Investigation of Learner Attitude Towards Recently Introduced Classroom Technology." *Journal of Information Technology Education* 9: 31–52.

Masrek, M. N., A. Jamaludin, and S. A. Mukhtar. 2010. "Evaluating Academic Library Portal Effectiveness: A Malaysian Case Study." *Library Review* 59 (3): 198–212.

Mohammad. A. 2011. "Modeling Student Perception of Web 2.0 Technologies Adoption in Kuwait." PhD thesis, University of North Texas. http://digital.library.unt. edu/ark:/67531/meta-dc67955/ (accessed February 10, 2014).

Moon, J. W., and Y. G. Kim. 2001. "Extending the TAM for a World-Wide-Web Context." *Information and Management* 38 (4): 217–230.

Munguatosha, G. M., P. B. Muyinda, and J. T. Lubega. 2011. "A Social Networked Learning Adoption Model for Higher Education Institutions in Developing Countries." *On the Horizon* 19 (4): 307–320.

Narayan, V., and L. Baglow. 2010. "New Beginnings: Facilitating Effective Learning Through the Use of Web 2.0 Tools." In *Curriculum, Technology and Transformation for an Unknown Future, Proceedings Ascilite Sydney 2010*, edited by C. H. Steel, M. J. Keppell, P. Gerbic and S. Housego, 658–667. http://ascilite.org.au/conferences/sydney10/procs/Narayan-full.pdf (accessed March 14, 2014).

Okechi, O., and O. Kepeghom. 2013. "Empirical Evaluation of Customers' Use of Electronic Banking Systems in Nigeria." *African Journal of Computer and Information and Communication Technologies* 6 (1): 7–20.

Okello-Obura, C., and F. Ssekitto. 2015. "Web 2.0 Technologies Application in Teaching and Learning by Makerere University Academic Staff." *Library Philosophy and Practice* 124 (8): 1–23.

Okereke, E. C. 2014. "Awareness, Competencies and Use of Social Media in Teaching by Lecturers in Higher Institutions in South–East of Nigeria." *European Journal of Business and Management* 6 (36): 149–154.

Olatokun, W., and O. Owoeye. 2012. "Influence of Individual, Organizational and System Factors on Attitude of Online Banking Users." In *Proceedings of Informing Science and IT Education Conference*, 389–403. http://proceedings.informingscience.org/InSITE2012/InSITE12p389-403Olatokun0111.pdf (accessed October 13, 2014).

Onuoha, U. D. 2013. "Librarians' Use of Social Media for Professional Development in Nigeria." *Information Management and Business Review* 5 (3): 136–143.

Onyedimekwu, O., and M. Oruan. 2013. "Empirical Evaluation of Customers' Use of Electronic Banking Systems in Nigeria." *African Journal of Computing and ICTs* 6 (1): 7–20.

Petter, S., and E. McLean. 2009. "A Meta-Analytic Assessment of the DeLone and McLean IS Success Model: An Examination of IS Success at the Individual Level." *Information and Management* 46 (3): 159–166.

Petter, S., W. DeLone, and E. McLean. 2008. "Measuring Information Systems Success: Models, Dimensions, Measures, and Interrelationships." *European Journal of Information Systems* 17 (3): 236–263.

Phan, K., and T. Daim. 2011. "Exploring Technology Acceptance for Mobile Services." *Journal of Industrial Engineering and management* 4 (2): 339–360.

Ramayah, T., and J. W. Lee. 2012. "System Characteristics, Satisfaction and E-Learning Usage: A Structural Equation Model (SEM)." *Turkish Online Journal of Educational Technology* 11 (2): 196–206.

Trkman, M., and P. Trkman. 2009. "A Wiki as Intranet: A Critical Analysis Using the DeLone and McLean Model." *Online Information Review* 33 (6): 1087–1102.

Urbach, N., and B. Müller. 2012. "The Updated DeLone and McLean Model of Information Systems Success." In *Information Systems Theory: Explaining and Predicting Our Digital Society, Vol. 1*, edited by Y. K. Dwivedi, M. R. Wade and S. L. Schneberger, 1–18. New York: Springer.

Virkus, S. 2008. "Use of Web 2.0 Technologies in LIS Education: Experiences at Tallinn University, Estonia." *Electronic Library and Information Systems* 42 (3): 262–274.

Zhang, Z. 2010. "Feeling the Sense of Community in Social Networking Usage." *IEEE Transactions on Engineering Management* 57: 225–239.

Zheng, Y., K. Zhao, and A. Stylianou. 2013. "The Impacts of Information Quality and System Quality on Users' Continuance Intention in Information-Exchange Virtual Communities: An Empirical Investigation." *Decision Support Systems* 56: 513–524.

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