

Influence of perceived ease-of-use on the use of Web 2.0 tools for academic activities by undergraduates in two Nigerian universities

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Abstract

Many undergraduates in Nigerian universities are faced with the problems of knowing which Web 2.0 tools are available for which academic activities and the need to use them seamlessly with little or no effort. It is to this end that this study sets out to examine the influence of perceived ease of use on the use of Web 2.0 tools for academic activities by undergraduates in two Nigerian universities. Descriptive survey research design was adopted for this study. Multi-stage sampling technique was used to select the sample size of 290 out of a population of 35,902 students. Data collected from 281 respondents who duly filled and returned the structured questionnaire from the University of Ibadan and Obafemi Awolowo University were analysed with descriptive and inferential statistics. Findings revealed that most of the respondents found Web 2.0 tools easy to use, easy to understand, flexible and user-friendly. These findings may not be unconnected with their past experiences in using the tools for recreational purposes. A significant positive correlation was found between perceived ease of use and use of Web 2.0 tools ($r = .291$; $df = 280$; $p < 0.05$). Meaning that, the students' perception of the ease of use of the tools actually increases their use for academic activities. The major constraints found by the study are lack of Internet connectivity, electrical power failures and cost of Internet access. The study recommended, among others, that higher Internet bandwidth, alternative electrical power sources and a wide range of Web 2.0 tools should be provided at little or no cost by the University Managements for the gainful use of the technology savvy students for enhanced learning achievements. It was further advised that training should be provided for lecturers who are much older and may not be that adept in the use of Web 2.0 tools for personal development and lecture delivery to enable their being in charge of the teaching-learning environment and to flow with and contribute meaningfully to the educational attainment of their millennia, 22nd century students.

Keywords: Perceived ease of use, Web 2.0 tools, Undergraduates, Nigerian universities, Nigeria.

Introduction

Higher education has been undergoing a paradigm shift away from teacher-centred instruction to student-centred learning whereby learners construct knowledge for themselves and take more active roles in shaping and leading their own educational experiences (Schoenborn & Rees, 2013). Increasingly, universities have started to engage their students as partners in contributing to curriculum design, delivery of learning resources and researching different aspects of learning and teaching. Exter, Rowe, Boyd and Lloyd (2012) posited that Web 2.0 tools are used in higher education context because they can: help engage students in their learning while providing social interaction with their peers in the learning process; enable

students to work at the conceptual level of understanding on authentic projects where they can solve problems, discover relationships, discern patterns and develop a deep understanding of content; and collaboratively build knowledge; allow students and teachers the opportunities for reflection and ultimately cultivate communities of practice. Collaboration, social-networking, as well as knowledge generation and sharing have been identified as the key learning technology trends that will reshape the education worldwide (Brown & Adler, 2008; Hargadon, 2008).

University education is undergoing a major transformation enabled by Information Technology (IT) such as Web 2.0 tools which support the key learning trends (Grosseck,

2009). Moreover, Web 2.0 tools provide on-demand applications for students in retrieving and sharing knowledge in a distributed environment. Zorba (2011) opined that in recent years, computer technology has been increasingly utilized for educational settings. University undergraduates are substantially involved in technology in and out of the classrooms. Most schools have been built according to computer technology needs and equipped with necessary hardware, software and network infrastructure for the Internet access.

Scholars (McLoughlin & Lee, 2010) suggest that there is an increasing student expectation for blended and online learning and teaching activities supported by Web 2.0 tools. More so, learning and teaching activities now take place both in physical and virtual spaces with a range of tools, including learning management systems, other university-supported applications and tools and an increasing variety of public Web 2.0 domains such as Facebook, Twitter, blogs, wikis, messenger, video-sharing sites, and the likes (Queensland University of Technology, 2011). Today's students, so-called digital natives or the Net generation, are typically familiar with Web 2.0 tools. Smith, Salaway and Caruso (2009) surveyed over 30,000 college students in the United States and found that 90% of the students use Web 2.0 tools and of these, 63% use them daily. Moreover, 40% of the students engage in content creation via other Web 2.0 tools including video-sharing websites (YouTube), wikis (Wikipedia), blogs and podcasts. Given that this survey was conducted in 2009, the number of students who use Web 2.0 tools has by now increased. These data suggest that the tools are an important part of students' lives. With the growing popularity of Web 2.0 tools among university undergraduate students, efforts have been made to integrate these technologies into their institutions' lecture rooms.

Several researchers have also reported on the pedagogical merits of Web 2.0 (McLoughlin & Lee, 2008). Web 2.0 tools in academia have recently been an active area of research and a topic of discussion. In contrast to e-learning technologies and e-research tools that have been created with a particular educational purpose or research activity in mind, technologies subsumed under the term "Web 2.0" are usually non-academic in nature. Yet, some Web 2.0 tools such as blogs and wikis have more or less obvious applications within academia and have been readily adopted generally by academics while others are only applicable in particular academic contexts.

Previous studies have shown that students used Web 2.0 tools for personal purposes as communication tools (Kennedy, Dalgarno, Gray, Judd, Waycott, Bennett, Maton & Krause, 2007) and for educational purposes (Bawden, Bates, Steinerovu, Vakkari & Vilar, 2007; Trinder, Guiller, Marggaryan, Littlejohn & Nicol, 2008). A study by Virkus and Bamigbola (2011) on students' conceptions and experiences of Web 2.0 tools in Estonia, found that students used Web 2.0 tools as professional and multi-purpose tools. The study revealed that students' experiences of Web 2.0 tools varied and that resulted in the four different categories of descriptions of use such as: communication, educational, professional and multi-purpose. It was apparent from the study that students had realized various potentials of the Web 2.0 tools. They also realized that Web 2.0 tools could be used not only as communication and educational tools but also as professional and multi-purpose tools.

Web 2.0 tools can facilitate the exchange of information and ideas as well as collaboration, the tools support networking, enrich distance communication and can be used to manage and publish data and information. Yaoyuneyong, Thornton and Lieu (2013) concluded that currently, a wide variety of Web 2.0 tools with potential in

teaching and learning are available for educators and students. Through Web 2.0 applications, students can develop necessary skills for any professional-level position, including computer literacy, communication, presentation, problem-solving, collaboration and time management. In addition, Web 2.0 tools can help students connect their theoretical knowledge with skills that will help them in their future jobs and careers. Grosbeck (2009) concluded that Web 2.0 tools for higher education and students offers many advantages, which include: easier and faster access to information, when and where it is needed and sharing of accumulated experiences and resources, among others.

Moreover, because student work can be shared with people beyond the classroom, students can also benefit from interacting with a much wider audience (McLoughlin & Lee, 2008). Given this advantage of Web 2.0 tools, a growing number of instructors are considering using them in their classrooms. Teaching and learning with Web 2.0 tools seem to have an impact on students' actual learning and performance as well. Furthermore, Cobanoglu and Berezina (2011) reported that students in a hospitality course showed an enhanced engagement with their reflection paper assignments when they posted them on their blog, as compared to those instances in which they typed them in papers.

Park (2013) equally submitted that Web 2.0 tools share characteristics that accommodate support for autonomy, competence, and relatedness, which promotes student engagement. Several empirical studies according to Park have also indicated that Web 2.0 tools facilitated high-quality learning for students. Therefore, the integration of Web 2.0 tools into reading tasks is likely to enhance students' active engagement with reading materials. Ellison and Wu (2008) found that students in a general education course can use a blog to present their reflections about course readings. As each student can have his or her own customized blog, students are likely to

perceive ownership for the blog. To further support students' autonomy, they concluded that, the instructor may provide several discussion topics from which students can choose for their writings on the blog. Moreover, students may be asked to make comments on their peers' blog postings so that they can connect to their peers as well as receive feedback from them. For more efficient interactions, the entire class can be separated into several groups whose members become blogging peers. If individual students in the group choose to respond to different discussion questions, they can learn from each other's blog postings. Supporting this approach, Hsu and Wang (2010) maintained that with perceived ownership and responsibility accompanied by peer interaction, such blogging activities could promote student engagement in reading and learning.

Davi, Frydenberg and Gulati (2007) submit that the use of "blogs" has become popular among colleges because faculty members have integrated blogs into their courses to enhance class discussion. They concluded that liberal learning depends on students taking responsibility for their education while instructors in any discipline can use blogs to begin conversations about courses materials before and after classes and as such enhance active learning. Davi, et al. (2007) stated further that the idea behind blogging makes it an improvement for classroom use over the discussion groups because one can visit a blog occasionally to see if there is any new content posted by visitors to the blogs based on its "publish-subscribe" model in which the author publishes content and the subscribers use a program known as aggregator which checks the blog from time to time to notify the subscriber whenever new content are posted.

Morgan (2012) in his contribution opined that Web 2.0 tools give power to the students. 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. 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. These applications, such as blogs, wikis and aggregators, have a participative element, which encourage users to add, edit or simply rehash content (mashups) (Newstead, 2007).

Junco, Heiberger and Loken (2011) revealed that Web 2.0 tools, Twitter in particular, was used in a seminar course to facilitate students' academic and co-curricular discussions and found that students who used Twitter increased their academic engagement and subsequently achieved a higher semester GPA. They established that Twitter is a popular Web 2.0 tool that features a public, ongoing dialogue. On Twitter, students can post a message, or a tweet, with a limited number of characters or words. The posted messages are shared (re-tweeted) among other students (friends on Twitter) who can reply to the message. The authors reiterated that the unique feature of Twitter among undergraduate student is that users can tag keywords with hash tags within tweets. When the tagged word is clicked, all the tweets that tagged the same word are searched. In a simpler way, Twitter functions much like a text message sent publicly to a group of friends within this particular website. When Twitter is incorporated into a classroom, the interactive communication feature enabled by Twitter seems to facilitate student interest and trigger active participation and engagement. Students themselves also acknowledged the value of Twitter on their learning (Rinaldo, Tapp & Laverie, 2011).

Facebook is another Web 2.0 tools which is the most popular Web 2.0 tools commonly used by students. For the most part, students use it to share life events or opinions. Facebook users, basically students can also

chat with friends, share personal photos and/or videos, join and/or form social interest groups and play online games. He maintained that Facebook thus enables students to effectively connect to and interact with friends. As a result of the various activities provided by Facebook, many students are attracted to it. Facebook can be used in a way similar to the manner in which Twitter is integrated into course reading assignments. Benefits of Facebook as opined by Mazman and Usluel (2010) include the opportunity to: have a personalised profile, communicate and share information, create friends list, create and/or watch reels and create and/or play different kinds of online music. Moreover, students can give comments, support ideas or retrieve new knowledge whilst networking with their friends at the same time (Uzunboylu, Bicen, & Cavus, 2011). The use of social sites such as Facebook can significantly contribute to students' life-long learning outcomes.

A 2011 Report by the EDUCAUSE Centre for Applied Research showed that students utilise the Web for social interaction through sites like Myspace and LinkedIn which offer professional and social post-sharing (blogging), link-sharing (bookmarking), collaborative or competitive gaming platforms, fora, chat rooms and webinars (Dahlstrom, de Boor, Grunwald & Vockley, 2011). Additionally, as noted in 2012, tablet computing has filtered into higher education (Johnson, Holdsworth, Hoel, & Zapf, 2013). A large majority of students use tablets, not only to access media content, including wikis, blogs, podcasts, webcasts and email but also to access textbooks, journals and other course materials (Johnson et al., 2013). It is worth of note that tablets are now becoming affordable to Nigerian undergraduate students and their use for academic activities is now common.

Majid (2014) submitted that Web 2.0 tools are expected to assist students to acquire knowledge effectively in their university environment. According to him, Web 2.0 tools

should be integrated into learning strategies in order to enhance the motivation of the students to use the tools. In his study, the integration of the tools in learning the programming course he examined is based on PQR strategy, which includes three components: Preview, Questions and Reflect. The study sample consisted of 39 students who identified their preferences for the use of Web 2.0 tools which include Blog, YouTube, Google Form and Padlet. The results show that the influence of Web 2.0 tools' use on the students' learning was positive. He concluded that it was possible to integrate a learning strategy with specific Web 2.0 tools and thus facilitate blended learning.

Similarly, another finding from a study by Köse (2010) on a blended learning model which supported the use of Web 2.0 tools revealed that 26 out of 39 students agreed that learning based on PQR model using Web 2.0 tools made learning more effective and attractive. This shows that Web 2.0 tools provide an alternative way for the students to discuss the subject with the lecturer other than by face-to-face meeting. Buzzard, Crittenden, Crittenden and McCarty (2011) found that students, more than instructors, preferred using technologies in the classroom.

Cloud computing is also a key member of Web 2.0 tools where applications reside in the cloud (O'Reilly, 2005). An example of this is Google docs spreadsheet, a cloud application which students from different locations can co-edit simultaneously (Qiyun & Huay Lit, 2009). Evidence from the students who use podcasts, another Web 2.0 tool, according to Edirisingha, Rizzi, Nie and Rothwell (2007), clearly showed that they immensely benefited from its usage and that the key objective for the use of podcast among the undergraduate module was to improve the students learning and study skills while the data analyses revealed that podcasts were successful in supporting students preparation for assessed work as well as provision of

significant advice on portfolio and presentations. Furthermore, Radel (2011) opined that majority of the past research into the social networking sites and their uses actually suggested that the World Wide Web usage is changing rapidly while the higher education institutions are also following the trend and working to develop their blended learning opportunities.

Web 2.0, 3.0 and beyond are the greatest opportunity in offering "environments of collective intelligence" where every user participates in the process of creating new knowledge (Radel, 2011). Meanwhile, the study of Leung and Kaiwahchu (2009) on using Wiki for collaborate learning examined the use of wiki in a group project among students in Hong Kong and discovered that wiki logs and discussion boards greatly assist in the learning process and also contribute to the learning community in higher education. Similarly, wikis can be used as a means of collaborative creation of knowledge artefacts; Wikipedia being a prominent example. In educational settings, wikis can be successfully used by students for collaborative writing tasks among the members of a team, as well as for creating and maintaining learning content, both by students and teachers.

Social bookmarking tools can equally be used for storing and sharing links to resources of interest for the course (that is, a kind of 'personal knowledge management tool'). Students can share bookmarks they have discovered with their peers and also tag and rate the collected resources (Homola & Kubincova, 2009). It has been found that both undergraduate and graduate students use the bookmarking function very frequently when it is offered by the university and library (Kim & Abbas, 2010). In order to meet the patrons' needs, many universities' libraries have made their sites more attractive by offering bookmarking, tagging and the ability to add book reviews/ratings/summaries to contents on their Websites.

Majid (2014) further in his study stated earlier concluded that 24 out of 39 students agreed that 'If Web 2.0 tools are used for my other lessons, my success will increase' (item 10). This shows an interesting finding in which the students may want to use Padlets to post their questions, use blog to share information related to the subject or use YouTube to preview the contents of the upcoming class. He submitted that a student can stick a note on a wall for any questions related to a topic anonymously. The lecturer then can discuss every sticky note on the wall during the lecture. The students will be appreciated when the lecturer responds to their questions in this interaction. The use of Web 2.0 tools in learning processes can help to develop the cognitive skills of undergraduates in thinking, problem solving and learning. It is necessary for all the teachers and student teachers to develop their personal knowledge and ability in technology in order to seamlessly help and guide their students in that regard.

The attention of Sandars and Schroder (2007) was drawn to the noticeable development of the high use of instant messaging, media sharing and social networking by young people, especially those below 24 years of age and hence examined the use of Web 2.0 among undergraduate and post-graduate medical students. He found an overall high awareness of a range of Web 2.0 tools for educational purposes while calling for increased training on the specific use of more of the tools among the students. Day and Kumar (2010) however, specifically established that the three (3) most useful Web 2.0 tools were online forums or blogs; class capture in the form of video casts, audio podcasts or smart board capture as well as Google documents. Their study also shows that undergraduates welcome teaching and learning experiences with the adoption of new technologies which will add value to the existing practice and lead to the enhancement of the learning process which gratify all types

of learners. In using Web 2.0 tools, the ease of updating content allows materials to stay current while students may still access posts or episodes from months (or years) earlier. Content is also easily extended in these environments, as links to additional information may be included.

From the extant literature above, it has been established that higher education students, especially university undergraduates used many types of Web 2.0 gainfully, particularly for educational purposes. However, we need to know factors which may influence their use of these tools. Prior research studies in the same regard showed that some factors can play important roles in influencing undergraduates' decision on whether or not to use a Web-based technology. These factors have been found to include Perceived Usefulness (PU), Perceived Ease of Use (PEoU) and Perceived enjoyment (PE). They are constructs proposed by the Technology Acceptance Model edition 3 (TAM3) developed by Venkatesh, Morris, Davis and Davis (2003).

Perceived Ease of Use (PEoU) was defined as the degree to which an individual believes that by using a particular technology he would be exposed to little or no effort (Davis, 1989). PEoU has strong influence on intention to use, technology acceptance and use. In other words, if one perceived a technology to be easy to use, one will make it a new alternative to use. Based on previous research on TAM, PEoU was found to have indirect effect on intention and attitude but the effect is much more on the indirect mediation factor from PU (Igbaria, Pavri & Huff Sid, 1989). According to Burkšaitienė and Selevičienė (2015), "perceived ease of use is defined as the extent to which students believe that using a particular Web 2.0 tool would free them of effort". This study therefore intends to investigate the PEoU (or otherwise) of Web 2.0 tools by undergraduate students and its effects on their use of the tools for academic activities in two Nigerian universities.

Statement of the problem

Some undergraduates in Nigerian universities seemed familiar with the use of Web 2.0 tools basically for recreational purposes and social engagements but they do not explore these innovative and interactive tools effectively to enhance their academic performance other than using the ubiquitous technology for fun and pleasure seeking through image and video making, editing and uploading, online chatting, online transactions, e-commerce, e-transport booking and the likes. However, some of these undergraduates *do not know* that a good number of these Web 2.0 tools can be proficiently exploited to bring about robust value addition to their studies in the areas of quantum access to some online resources which may be useful for classroom work, research studies and general performance in the teaching and learning situation. Moreover, they are faced with the problems of knowing which Web 2.0 tools are available and for which academic activities they could be used profitably. Besides, if the available ones are not easy to use the students may not accept and use them in any subject of interest.

It is to this end that this study sets out to examine the influence of perceived ease of use on the use of Web 2.0 tools for academic activities by undergraduates in two South-western Nigerian universities, namely, University of Ibadan, Ibadan and Obafemi Awolowo University, Ile Ife.

Research questions

The following research questions have been raised to guide the study:

1. What are the academic activities for which undergraduate students in the two universities use Web 2.0 tools?
2. How easy to use are the Web 2.0 tools perceived by the students for academic activities?
3. What are the constraints to the use of Web 2.0 tools by the students for academic activities?

Hypotheses

The study will test the following null hypothesis at 0.05 level of statistical significance:

Ho1: There is no significant relationship between students' perceived ease of use and the use of Web 2.0 tools by the undergraduates for academic activities.

Methods

The research design employed for this study is the descriptive survey design. Descriptive survey research design requires systematic and scientific collection of data or information from the population or sample of the population, through the use of personal interview, scaled opinion questionnaire, direct observation or a combination of the stated methods (Babbie, 2007). Descriptive survey is the most appropriate design for collecting original data to describe a population too large to be observed directly such as we have in this study.

The population for this study consisted of undergraduates of University of Ibadan (UI) and Obafemi Awolowo University (OAU), Ile. According to the data collected from the Records Office of UI, there are thirteen (13) faculties offering undergraduate programmes with a population of thirteen thousand one hundred and fifty three (13,153) undergraduates. The data collected from Academic Planning Unit of OAU showed that there are fourteen (14) faculties offering undergraduate programmes with a population of twenty two thousand, seven hundred and forty nine (22,749) undergraduates. This gives a total of thirty five thousand, nine hundred and two students (35,902) as the total population of the study (see Table 1).

Multi-stage sampling technique was used to select the sample size for the study. At the first stage, eleven (11) faculties were purposively selected on the basis of their availability in both universities with the

population of nineteen thousand eight hundred and fifty eight (19,858) students. The faculties are: Agriculture, Arts, Basic Medical Sciences, Clinical Sciences, Dentistry, Education, Law, Pharmacy, Science, The Social Sciences and Technology. At the second stage, a sampling fraction of 50% was used to select six (6) out of the eleven (11) faculties earlier selected and the selection was based on the randomization method. The Faculties include: Clinical science, Pharmacy, The Social sciences, Technology, Agriculture and Dentistry. This gave a total number of 14,480 students. The final stage involves the use of a sampling fraction of 2% to select the sample size for each of the faculties. Therefore, the sample size for this study comprise of 172 students from OAU and 118 from UI. This gave a total of two hundred and ninety (290) students (Table 2). This sample size is justified by Krejcie and Morgan (1970) cited in Hill (1998) who stated that a sample of 384 is enough for a population size of 100,000, thus the sample size is adjudged adequate for this study.

The research collection instrument was a structured questionnaire. The questionnaire had 4 Sections: A, B, C and D. Section A collected information on demographic data of the undergraduates including faculty, age and gender. Section B comprised of 18 items on the academic activities for which undergraduates use Web 2.0 tools while Section C comprised 14 items which measured perceived ease of use of Web 2.0 tools for academic activities. Section D

however, comprised 8 items on the constraints to the use of Web 2.0 tools by undergraduates for academic activities. A 4-point Likert scale with values ranging from 4 for Strongly Agree (SA), 3 for Agree (A), 2 for Disagree (D) to 1 for Strongly Disagree (SD) were adopted to measure the data collected under Sections B to D.

To ensure face validity of the instrument, the questionnaire was submitted to colleagues who read through and make necessary corrections towards determining the appropriateness of the items going by the research objectives. Relevant corrections were effected before administering copies of the questionnaire on the respondents. The reliability coefficient of the instrument was tested on 30 participants outside the study area using Cronbach's Alpha method.

The researchers administered the two hundred and ninety (290) copies of the questionnaire on the respondents in the selected faculties of the two universities. Copies of the questionnaire were collected, coded and analysed. The Statistical Package for the Social Sciences (SPSS) was used for the analyses. Descriptive statistics such as simple percentages, frequency counts, means and standard deviations were used to analyse the demographic data and data used to answer the research questions while inferential statistics such as multiple regression and correlation analyses were used to test the hypothesis at 0.05 alpha level of statistical significance.

Table 1 Study population of the undergraduates

Obafemi Awolowo University		University of Ibadan	
Faculty	No. of students	Faculty	No. of students
Administration	2,891	-	-
Agriculture	1,416	Agriculture and Forestry	1,368
Arts	2,495	Arts	1,695
Basic Med. Sciences	715	Basic Medical Sciences	521
Clinical Sciences	475	Clinical Sciences	1,161
Dentistry	176	Dentistry	190

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Education	1,778	Education	1,613
Environmental design and management	1,677	-	-
Law	1,659	Law	707
Pharmacy	648	Pharmacy	421
-	-	Public Health	142
Science	2,966	Science	2,098
The Social Sciences	2,835	The Social Sciences	1,452
Technology	3,018	Technology	1,340
-	-	Veterinary Medicine	445
Total	22,749	Total	13,153

Sources: Records Office, UI and Academic Planning Unit, OAU, 2014/2015 Session

Table 2 Sample size of the study

Faculties	OAU		UI		
	Population	Sample 2%	Population	Sample 2%	Sample size
Clinical Science	475	10	1161	23	33
Pharmacy	648	13	421	8	21
Social Sciences	2,835	57	1,452	29	86
Technology	3018	60	1340	27	87
Agriculture	1416	28	1368	27	55
Dentistry	176	4	190	4	8
Total	8568	172	5912	118	290

Results

A total of two hundred and ninety (290) copies of the questionnaire were administered to respondents in the two universities (University of Ibadan and Obafemi Awolowo University). One hundred and seventy two (172) copies were administered at Obafemi Awolowo University, out of which one hundred and sixty seven (167) copies were duly filled and

returned giving a response rate of 97.1%. In the same vein, one hundred and eighteen (118) copies were administered at the University of Ibadan out of which 114(96.6%) copies were returned.

The overall response rate from both universities as shown in Table 3 was 281(96.9%)

Table 3: Response rate

Faculties	Name of university		Total
	UI	OAU	
Agriculture	27 23.7%	28 16.8%	55 19.6%
Clinical Science	25 21.9%	10 6.0%	35 12.5%
Dentistry	4 3.5%	4 2.4%	8 2.8%
Pharmacy	8 7.0%	11 6.6%	19 6.8%
Social Sciences	27 23.7%	54 32.3%	81 28.8%
Technology	23 20.2%	60 35.9%	83 29.5%

Data on demographic characteristics of the respondents is presented using pie charts.

Fig. 1 revealed that most of the respondents 193(68.7%) were males. This implies that there were more males than females in the study. Figure 2 shows that 154(54.8%) of the

respondents were between ages 21 – 25 years while, 7(2.5%) were ages above 35 years. This implies that most of the respondents were still in their youthful and active years of university education as undergraduate students since they were still under 30 years.

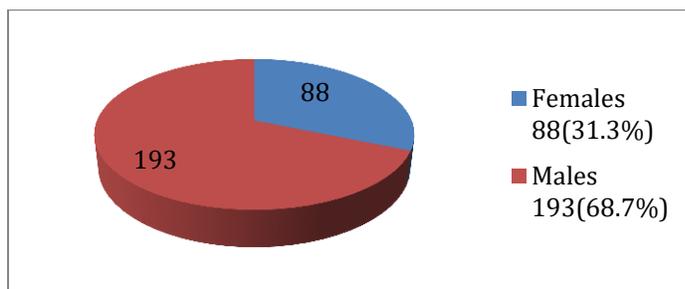


Figure 1: Gender of the respondents

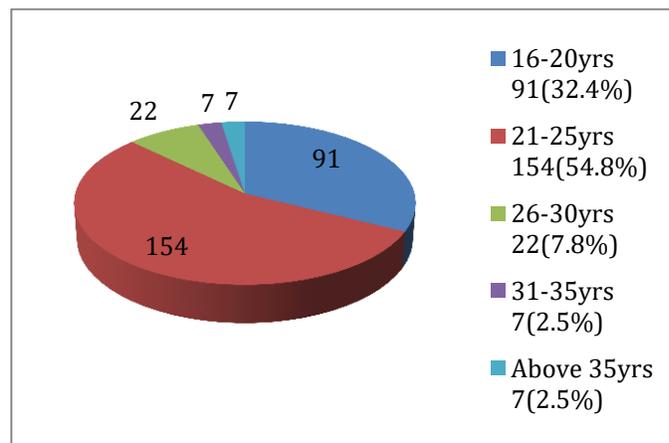


Figure 2: Age of the respondents

Research question one: What are the academic activities for which undergraduates in the selected universities use Web 2.0 tools?

Web 2.0 tools considered in this study include applications such as MySpace, Flickr, Orkut, YouTube, Blogs, Bookmarking, Google AD, E-Mail Tutorial, Scribd, Podcast, Twitter, Facebook, Instant Messaging App such as WhatsApp and BBM.

Table 4 presents the responses on the academic activities for which undergraduates in the selected universities use the Web 2.0 tools highlighted above.

Most of the respondents indicated that they used Web 2.0 tools for Assignment (mean = 3.45; std. = .721), dissemination of information (mean = 3.32; std. = .835), and Registration of courses (mean = 3.19; std. = .888). The least academic activities for which

the undergraduate students used web 2.0 include Workshop (mean = 2.61; std. = .912), Seminar (mean = 2.83; std. = .911), and Group discussions (mean = 2.91; std. = .926). Hence, it could be inferred that most of the

respondents used web 2.0 tools for assignment, dissemination of information, registration of courses, examination preparation, course material generation, and so on.

Table 4: Use of the Web 2.0 tools by the students for academic activities

Academic activities		SD	D	A	SA	Mean	Std. Dev.
Assignment	F	11	5	111	154	3.45	.721
	%	3.9	1.8	39.5	54.8		
Lectures	F	14	45	139	83	3.04	.810
	%	5.0	16.0	49.5	29.5		
Seminar	F	23	76	109	73	2.83	.911
	%	8.2	27.0	38.8	26.0		
Workshop	F	33	94	104	50	2.61	.912
	%	11.7	33.5	37.0	17.8		
Payment of tuition fees	F	27	33	132	89	3.01	.906
	%	9.6	11.7	47.0	31.7		
Registration of courses	F	24	17	122	118	3.19	.888
	%	8.5	6.0	43.4	42.0		
Group discussions	F	22	67	105	87	2.91	.926
	%	7.8	23.8	37.4	31.0		
Exam preparation	F	22	31	122	106	3.11	.890
	%	7.8	11.0	43.4	37.7		
Course material generation	F	17	46	118	100	3.07	.871
	%	6.0	16.4	42.0	35.6		
Dissemination of information	F	15	22	102	142	3.32	.835
	%	5.3	7.8	36.3	50.5		

Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD)

Table 5: Perceived ease of use of Web 2.0 tools by the undergraduates for academic activities

PEoU items		SD	D	A	SA	Mean	Std. Dev.
I don't normally get confused when I use Web 2.0 tools	F	5	51	158	67	3.02	.702
	%	1.8	18.1	56.2	23.8		
I don't usually make errors when using Web 2.0 tools	F	8	99	144	30	2.70	.695
	%	2.8	35.2	51.2	10.7		
Interacting with Web 2.0 tools is not frustrating	F	4	48	180	49	2.98	.635
	%	1.4	17.1	64.1	17.4		
I do not need to consult the user manual often when using Web 2.0 tools	F	3	46	148	84	3.11	.703
	%	1.1	16.4	52.7	29.9		
Interacting with the Web 2.0 tools does not require a lot of my mental effort	F	2	65	141	73	3.01	.722
	%	0.7	23.1	50.2	26.0		
I find it easy to recover from errors encountered while using Web 2.0 tools	F	8	32	172	69	3.07	.685
	%	2.8	11.4	61.2	24.6		
Web 2.0 tools content is very flexible to interact with	F	7	35	177	62	3.05	.667
	%	2.5	12.5	63.0	22.1		
Web 2.0 tools are easy for me to understand	F	6	27	173	75	3.13	.658
	%	2.1	9.6	61.6	26.7		
The level of uncertainty surrounding the outcome of the use of Web 2.0 tools for academic purposes is minimal	F	14	107	129	29	2.83	.581
	%	5.0	38.1	45.9	10.3		
The interfaces of Web 2.0 tools are user-friendly	F	5	57	146	73	3.02	.732
	%	1.8	20.3	52.0	26.0		

It is easy for me to remember how to perform tasks using Web 2.0 tools	F	5	34	170	72	3.10	.663
	%	1.8	12.1	60.5	25.6		
I find Web 2.0 tools helpful in doing assignments and other academic tasks	F	6	24	174	77	3.15	.652
	%	2.1	8.5	61.9	27.4		
Overall, I find Web 2.0 tools easy to use	F	4	25	163	89	3.20	.651
	%	1.4	8.9	58.0	31.7		

Research question two: What is the level of perceived ease of use of web 2.0 tools by the undergraduates for academic activities?

Data on perceived ease of use of Web 2.0 tools by the undergraduates is presented in Table 5.

The responses in Table 5 revealed that majority of the respondents indicated that they found Web 2.0 tools listed above easy to use (mean = 3.20; std. = .651). Similarly, most of the respondents affirmed that the Web 2.0 tools are helpful in doing assignments and other academic tasks (mean = 3.15; std. = .652). Many of the respondents also indicated that they interact easily with the Web 2.0 tools (mean = 3.13; std. = .658). On the other hand, a reasonable number of the respondents affirmed that they don't usually make errors when using Web 2.0 tools (mean = 2.70; std. = .695). In addition, not a few of the respondents indicated that the level of uncertainty surrounding the outcome of the use of Web

2.0 tools is minimal (mean = 2.83; std. = .581). It could therefore be inferred that most of the respondents not only perceived that Web 2.0 tools are easy to use, they also perceived them as flexible (mean = 3.05; std. = .667) and user-friendly (mean = 3.02; std. = .732).

In order to establish the level of the ease of use of Web 2.0 tools, a test of norm was conducted. Results showed that the scale 1 – 17 is low; 18 – 34 is moderate while 35 – 54 is high. The overall mean for perceived ease of use yielded “39.37” which falls between the high scale (35 – 54). Therefore, it could be concluded that the level of perceived ease of use of Web 2.0 tools for academic activities by undergraduates of the two universities under study is high.

Research question three: What are constraints to the use of Web 2.0 tools by the undergraduates for academic activities?

Table 6 presents the constraints to the use of Web 2.0 tools for academic activities by the undergraduates

Table 6: Constraints to the use of Web 2.0 tools by the undergraduates for academic activities

Constraints		SD	D	A	SA	Mean	Std. Dev.
Insufficient skills to apply the tools	F	17	97	131	36	2.66	.777
	%	6.0	34.5	46.6	12.8		
Insufficient access	F	10	71	152	48	2.85	.738
	%	3.6	25.3	54.1	17.1		
High cost of access	F	6	61	142	72	3.00	.749
	%	2.1	21.7	50.5	25.6		
Electricity failure rate	F	8	45	146	82	3.07	.750
	%	2.8	16.0	52.0	29.2		
Lack of Internet connectivity	F	6	46	136	93	3.12	.753
	%	2.1	16.4	48.4	33.1		
Inadequate training	F	18	107	137	19	2.56	.715
	%	6.4	38.1	48.8	6.8		
Time constraint	F	16	89	132	44	2.73	.793
	%	5.7	31.7	47.0	15.7		

Table 6 shows that most of the respondents indicated “Lack of Internet connectivity” (mean = 3.12; std. = .753) and “Electricity failure rate” (mean = 3.07; std. = .750). In the same vein, many of them indicated high cost of access (mean = 3.00; std = 749). The least constraints indicated by the respondents were “Inadequate training” (mean 2.56; std. = .715) and “Insufficient skills to apply the tools” (mean = 2.66; std. = .777). Thus, it could be inferred that the main constraints to the use of Web 2.0 tools by the undergraduates for academic activities include: lack of Internet connectivity;

electricity failure rate and high cost of access and that the students are adequately trained and sufficiently skilled to use Web 2.0 tools for academic activities.

Ho1: There is no significant relationship between the perceived ease of use of Web 2.0 tools and their use by the undergraduates for academic activities.

The null hypothesis formulated for this study was statistically tested at 0.05 level of significance and the results were presented in Table 7

Table 7: Correlation matrix table showing the relationship between the variables

Variable lists	Mean	Std. Dev.	Perceived ease of use	Use of Web 2.0 tools
Perceived ease of use	39.37	6.693	1	
Use of Web 2.0 tools	28.36	9.698	.291**	1
			.000	

** . Correlation is significant at the 0.01 level (2-tailed); N = 281

Table 7 shows that a positive and significant relationship exists ($r = .291^{**}$; $df = 280$; $p < 0.05$) between perceived ease of use and the undergraduates’ use of Web 2.0 tools for academic activities. This implies that the more the undergraduates perceived the Web 2.0 tools to be easy to use, the more they will use the tools. Thus, the null hypothesis was rejected.

Discussion

Findings revealed that most of the respondents used Web 2.0 tools for assignment, dissemination of information, registration of courses, examination preparation, course material generation, and so on. This is in line with Gibbons (2007) who posited that students not only search for information on the Web for their personal lives and school work, but act as creators to share information and their knowledge, experiences and/or opinions with people on the Web. The finding also supports Tautkevičienė, Gintarė and Dubosas (2014) who submitted that a learning environment, empowered by Web 2.0 technologies, substitutes a one-way stream of knowledge and information between a teacher (as an expert) and a student (as a novice) by the

exchanging knowledge and information with a network of learners.

It was found that most of the respondents perceived that Web 2.0 tools are easy to use just as their contemporaries in the developed world and that they provide helpful guidance in performing tasks; understandable and not confusing. Hence, the level of perceived ease of use of Web 2.0 tools by the undergraduate students of the two Nigerian universities is high. This is in support of Chen, Cannon, Gabrio, Leifer and Bailey (2005) and Boulos, Maramba and Wheeler (2006) who submitted that the increasingly ubiquitous access, ease of use, functionality and flexibility of emerging Web 2.0 technologies have made them much more appealing as instructional tools.

It was further revealed that the main constraints to the use of Web 2.0 tools by the undergraduates include: lack of Internet connectivity; electricity failure rate and high cost of access. However, Franklin and Van Harmelen (2007) pointed out that the problems and issues in the use of Web 2.0 tools by students in universities are: Intellectual Property Right protection for material created and modified by university members and external contributors; finding

appropriate pedagogical approaches for the curricular use of Web 2.0 tools; assessing the quality and validity of materials that may be collectively created and open to modifications; choosing uniform and compatible computer systems across the institution; rolling out Web 2.0 services across the university; choosing whether to host the services within the university or outsource it to external service providers and integrating each departmental networks with the institutional systems. Other problems found by the study relate to accessibility; visibility and privacy; control over content; longevity of data; data preservation; information literacy and staff and student training, some of which were corroborated in this research.

Finally, it was found that a positive and significant relationship exists between perceived ease of use and the undergraduates' use of Web 2.0 tools for academic activities. This corroborated the research of Richardson (2006) who found out that the acceptance and dependability of students on the use of Web 2.0 technology for academic activities correlated with how trusting they feel about the ease of use of the technology in the learning environment.

Conclusion

Based on the findings, it is concluded that the undergraduate students in the universities surveyed had high perceived ease of use of Web 2.0 tools and this influenced positively and significantly their use of Web 2.0 tools for academic activities. However, the main barriers to the use of the tools by the undergraduates include: lack of Internet connectivity; electrical power high failure rate and high cost of access, among others.

following recommendations were therefore made based on the results of the study:

1. The management of the universities in Nigeria should subscribe to high bandwidth Internet service and give access to students at affordable rates to enable their increase use of Web 2.0

tools for assignment, registration of courses, examination preparation and course material generation, among other academic activities as found in this study, in order to enhance their fruitful engagements and learning achievements.

2. Students should be encouraged to make use of their smart devices not only for chatting, leisure and entertainment but also for academic activities especially on Web 2.0 apps. This will ensure that their present ease-of-use of Web 2.0 tools for academic activities is sustained and improve upon.
3. In order to address the constraint of electricity outages, among others, it becomes imperative for university authorities to provide alternative power sources such as electrical power generating plant, solar powered panels, portable and rechargeable power batteries and inverters and biofuel for sustainable and gainful use of Web 2.0 tools for academic activities.
4. Adequate training, seminar and workshops on the use of modern, educational and pedagogical technologies should be organised by stakeholders for lecturers in the universities from time to time. This will enable them to attain mastery and maximize the opportunities presented by the use of (Web 2.0) technologies for teaching, learning and lecture delivery in order to impact and keep pace with their technology savvy students.

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