Information behaviour of Nigerian undergraduates in the world of Web 2.0

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Abstract

This study investigated the information behaviour of Nigerian undergraduates in the world of Web 2.0 at the Federal University of Petroleum Resources, Nigeria. The study is drawn from a doctoral thesis that used a mixed methods approach. The population and sample of the study was a total of 803 undergraduate students. Three research questions which focused on the information needs, information resources and infrastructure, and barriers to information seeking were answered using a questionnaire. The study revealed that students need information both for academic purposes and in their everyday life experiences. The data provide support for the convenience school of thought. It seems that time constraints and the inconvenience of traditional sources might be critical factors in the choices that students make in their information seeking. The barriers which students experience are both physical and intellectual. The physical barriers relate to technical issues such as the system freezing, server down time, access speed, and erratic power supply. The intellectual barriers concern their inability to choose appropriate subject headings, keywords, formulating search strategies, and choosing appropriate databases.

Keywords: Information behaviour, information literacy, Web 2.0, undergraduates, Nigeria

Introduction and background

The purpose of this research was to investigate the information behaviour of Nigerian undergraduates online, including Web 2.0, that is, the interactive World Wide Web. The Federal University of Petroleum Resources (FUPRE), Effurun, Delta State Nigeria, being a specialised university, was used as the case site for this study. Established in 2007 primarily to meet the demands of the petroleum industry, FUPRE is the first of its kind in Nigeria and the sixth in the world (Federal University of Petroleum Resources 2014). The mission of the University is to design, develop and deliver cutting edge education and training programmes for professionals in the industry and to engage in research, consultancy and development activities in all technical and managerial aspects of the oil and gas sector.

The University comprises two colleges, College of Science and College of Technology, and both colleges offer ten specialised degree courses. This research attempted to establish whether Nigerian undergraduates have the resources and skill sets for personal and academic development, which by extension translates to national development.

Universities, polytechnics, colleges of education, monotechnics, and innovative enterprise institutions offer tertiary education in Nigeria. In line with Nigeria Vision 20:2020, the primary aim of tertiary education in Nigeria is the production of highly skilled, knowledgeable, competent, conscientious, and globally competitive citizens (National Planning Commission 2010). Given Nigeria's vision to be one of the top 20 economies by the year 2020, the importance of information and communication technologies (ICTs) within the nexus of higher education and the thrust of human capital development initiatives in Nigeria, the timing of this research work with its focus on the information behaviour of undergraduates online, especially Web 2.0, is significant.

Literature review

The review of the literature that follows on the information behaviour of undergraduates focuses on two aspects, the internet and Web 2.0. While research studies on the online information behaviour of university students have been widely published since the late 1990s, there are fewer that focus on Web 2.0 tools and services in the teaching and learning context. Research studies in African countries in which Web 2.0 is used for educational purposes have emerged only in the last six years. This study addressed the gap in research on Web 2.0 use in African higher education, particularly student and faculty usage.

The information behaviour of students on the internet

The literature reveals a growing influence of the internet on students' information behaviour. Studies on students' information behaviour cover both information seeking for their academic studies and for their everyday life personal needs.

Across the literature and in disciplines such as the natural and applied sciences, social sciences and humanities, undergraduates use the internet as their primary source of information for academic purposes; this is due to the ease of use and convenience that is associated with search engines. Bawden and Vilar (2006), Griffiths and King (2008), Head and Eisenberg (2010), and Connaway, Dickey, and Radford (2011) showed that convenience is a critical factor in information seeking in different situations, including academic and everyday information seeking.

In Nigeria, there is some research on the information behaviour of Nigerian undergraduates and their information literacy levels, some of which takes place within specific faculties and disciplines, for example, Adetimirin (2012), Baro and Fyneman (2009), Baro, Onyenania, and Osaheni (2010), Ejiwoye and Ayandare (2011), and Emmanuel and Jegede (2011). These studies show that students seek information both for their academic work and their everyday life information needs.

The use of the internet tops the list of information sources due to its speed, easy accessibility, multimedia formats and it seems to have all the information that is needed (Nkomo 2009; Krubu 2013). Even though undergraduate students do consult the internet as their primary information source, the content varies based on their discipline. Besides the heavy reliance on the internet, it is also noted by Nkomo (2009) and Krubu, Zinn and Hart (2017) that students still depend on other sources, especially text books.

Students' information behaviour on Web 2.0

Besides the use of Web 2.0 in social networking, the teaching-learning potential of Web 2.0 has led to its recent more frequent application in higher education (Arnold and Paulus 2010; Hung and Yuen 2010). It is a trend in teaching and learning that is quite unique to the 21st century. Web 2.0 tools offer different ways of communicating with young library users in non-traditional ways that extend beyond physical walls (American Library Association 2013).

The use of Web 2.0 tools for academic purposes is one of the topical issues demanding serious attention in the research. The literature on the subject in the Nigerian context appears slim, probably due to the low level utilisation of Web 2.0 tools for teaching and learning purposes by students and educators alike. However, some research in Nigeria, Australia, the United States of America (USA) and South Africa is discussed.

In Nigeria, Dyaolu and Rifqah (2015) reported on a study of undergraduate use of Web 2.0 for educational purposes at two private universities, Crescent Abeokuta and Caleb, Lagos. Their findings revealed that Wikipedia, wikis, Google docs, blogs, and social networking were the preferred choices although the study did not gauge whether academic staff used Web 2.0 tools and services in teaching and learning. Eze's (2016) study on the awareness and use of Web 2.0 tools by Library and Information Science (LIS) students at the University of Nigeria, Nsukka, revealed that students are aware and also use Web 2.0 tools but mainly for social and entertainment purposes, not necessarily for academic purposes. Contrary to this, Folorunso, Olapade, and Awujoola (2016) found that undergraduates at the Universities of Ibadan and Obafemi Awolowo use Web 2.0 tools both for academic and entertainment purposes. However, all three research works are silent on the incorporation of Web 2.0 tools by lecturers in the process of teaching.

Newer studies apply the debate to lecturers' use of social media. Chawinga (2016; 2017) focuses on lecturers' use of social media such as Twitter and blogs in a Malawian university classroom. He makes the case for social media being an "impetus for the learner-centred approach to teaching and learning" (2016: 45). Murire and Cilliers's (2017) study of social media adoption among lecturers at the University of Fort Hare reports that lecturers are positive about adopting social media in teaching and learning in the near future.

In Australia, Bennett, Kennedy, Waycott, Dalgarno, and Bishop (2012) investigated how the use of Web 2.0 tools influences undergraduates' engagement in academic work and possible learning outcomes. Findings explicated the possible learning benefits that Web 2.0 offers if it is used effectively. Such benefits may arise especially through student content creation and sharing. However, students' inability to use technologies efficiently, which is suggested in the survey, was confirmed in the case studies. Dohn (2009: 344) argues that, to use Web 2.0 effectively, there is a need to possess a "lifelong, life-wide" set of skills that traverses the boundaries between formal and informal learning that cannot be overemphasised. For students to utilise Web 2.0 tools effectively, they must be able to gather, analyse and synthesise information, communicate effectively, collaborate with others, think creatively and critically, and also possess computer and internet literacy skills.

The EDUCAUSE Centre for Applied Research (ECAR) (Dahlstrom 2012) explored the use of social networks on Web 2.0 platforms across 184 USA institutions. Findings revealed that students do not want to mix their social lives with academic lives. Three of every five students who participated in the study, both in 2011 and 2012, preferred social networks for interacting with friends more than for academic communication. Recently, however, studies by Atieno (2013) and Chawinga and Zinn (2016) revealed that students are beginning to adopt Web 2.0 technologies for academic purposes. Similarly, Sugimoto, Hank, Bowman, and Pomerantz (2015) acknowledge that there is a blurring of boundaries between social networks used for entertainment and academic purposes with a trend towards acceptability in academia.

Conceptual framework

This study is premised on the concepts of information behaviour, information access, the World Wide Web and Web 2.0, and the convenience school of thought (Connaway et al. 2011).

Information behaviour

Information behaviour is a concept that incorporates information needs, uses, seeking and gathering. Information need is the conscious awareness of a gap, fanned by the intention to seek meaning in order to fill the gap and become knowing (Bawden and Robinson 2012). Information seeking is a conscious and deliberate effort to acquire information in order to bridge a gap in one's knowledge (Case 2006).This process requires information handling skills, also referred to as information literacy skills.

Information access

Information access comprises three levels, physical, intellectual and social, which determine the ability of an individual to seek, find and use information for the purpose of satisfying a need. Both intrinsic and extrinsic factors determine access to information (Burnett and Jaeger 2011).

Physical access is the first level of access to information which may be enhanced or constrained by external factors. This level of access includes the physical structures that contain information, the electronic infrastructures that contain information, and the paths that are travelled to get the information (Burnett, Jaeger and Thompson 2008). Physical access is a pre-condition to the next level of access (Krubu 2013).

Intellectual access is dependent on the individual's cognitive skills which translate to the knowledge of how to source the needed information, critique, evaluate and filter the information and exploit it to achieve some set objectives and goals.

Social access refers to the information behaviour of people within defined social contexts (Burnett et al. 2008). The social context may range from personal communication for academic engagement to personal communication for other activities.

The World Wide Web and Web 2.0

The World Wide Web or Web is an electronic environment that is ever evolving with new applications. Web 2.0 describes the upgraded, improved, and modernised World Wide Web in use in this epoch (Funk 2009); it involves a paradigm shift in technology and the way people interact online. Web 2.0 captures the evolving trends in the use and design of World Wide Web technology that enhance creativity, communication, secure information sharing, collaboration, interaction, and functionality (Sastry and Reddy 2010). Examples of Web 2.0 platforms are social networking sites such as Facebook, Twitter, Yahoo, and Google; blogs, Weblogs and moblogs (mobile blogging – blogging from a mobile phone or other handheld device); wikis; video sharing sites (YouTube), and slide sharing sites (Slideshare).

Convenience concept in information behaviour

The concept of convenience is a critical factor in information seeking in a variety of situations, including academic and everyday like information seeking. Convenience relates to ease of access to information resources, ease of use, and time to access and use resources (Connaway et al. 2011: 28). The theoretical underpinnings are the concepts of bounded rationality and rational choice theory, Savolainen's (2005) concept of time as a context in information seeking, as well as his gratification theory.

Research questions

The research was guided by the following three research questions and sub-questions that were in turn informed by the literature and the conceptual frameworks.

1. What are the information needs of Nigerian undergraduates in terms of their academic work and everyday life?
2. What are the information resources and infrastructure available to undergraduates?

i. What personal electronic devices do undergraduates have and use?
ii. What access to the internet do students have off and on campus?
iii. What are the search tools and information sources mainly consulted by undergraduates?
iv. What online electronic resources such as full text databases are available via the library and other information centres?

3. What is the information behaviour of undergraduates in the world of Web 2.0?

Research methodology

This article reports on a section of a broader doctoral study that used a mixed methods approach (Creswell and Creswell 2018) and included, besides the questionnaire, interviews with librarians and lecturers, analysis of assignments, and large group discussions. In this article the focus is on the results of a survey by questionnaire completed by students at FUPRE, Effurun, Delta State.

The total enumeration sampling technique was used in the study which comprised the first and third year students of the Colleges of Science and Technology. Students within each college might well have had different information behaviour – perhaps following the norms of their college's discipline. The first-year students were chosen as first years are those bridging the gap between secondary school and university. They provided the study with insight into the information behaviour of students traversing this divide. Third-year students are senior students with more experience of ICTs and online information resources than first years. By choosing these two extreme levels it was hoped the study would reveal both similarities and differences in their information behaviour.

The total population of the first and third year students in both colleges is 803 as indicated in Table 1. Due to the relatively low population, the researchers targeted the entire population of students in the 100 (first year) and 300 (third year) levels in both colleges.

Table 1: Student population in the Colleges of Science and Technology

Serial No.	**College of Science**	**College of Technology**	**Total**	**%**
First year	201	206	407	51
Third year	176	220	396	49
Total	**377**	**426**	**803**	**100**

A pilot study was conducted to test the instrument among undergraduates of the Department of Computer Science in Ambrose Alli University, Edo State, Nigeria, where one of the researchers is currently employed. Using the responses from the pilot study, the questionnaire was improved.

With the support and cooperation of some course lecturers and class representatives, 803 copies of the questionnaire were distributed during class time to all the first and third years in the Colleges of Science and Technology at FUPRE. However, although 782 copies of the questionnaire were returned by the 803 students targeted only 711 were found usable. Consequently, the response rate was 88.5%.

Data presentation and discussion of findings

The demographic data are presented first, followed by the general academic information seeking behaviour, and then the data on the information behaviour when using Web 2.0 for academic and personal use.

Gender

A much larger number of male (80%) than female (20%) students in both first and third years at FUPRE responded to the questionnaire. FUPRE is a specialised university of science and technology and has low patronage by female students. This appears to be because the nature of the courses offered which are science- and technology-based, are mistakenly assumed to be the preserve of males.

There has been a growing concern about the low enrolment of females generally in tertiary institutions across Africa and, in fact, the world (Kishore 2008). A study by Aderemi, Hassan, Siyanbola, and Taiwo (2013) on gender participation in tertiary enrolment, graduation and staffing of science and technology, sponsored by the Federal Ministry of Science and Technology in Nigeria, showed that female participation over the period of 1997 to 2006 varied across the different geopolitical zones of Nigeria. However, there was a general increase of 81% for males and 110% for females over the 10-year period.

Age and level of study

The majority of respondents in both first and third years were within the age bracket of 15 to 24 years as evident in Figure 1. There is no record of any respondent above the age of 34. This suggests that the majority of the respondents had grown up with digital technology.

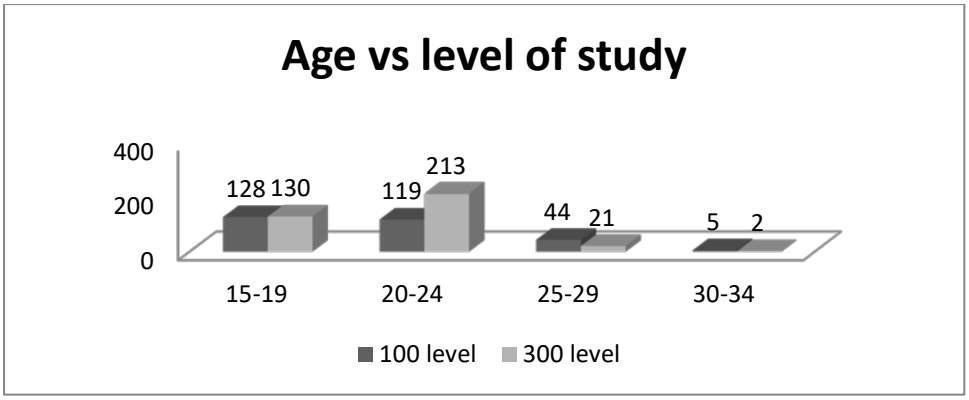

Figure 1: Age vs level of study of respondents (n=711)

Research question one: What are the information needs of Nigerian undergraduates in terms of their academic work and everyday life?

Table 2 reveals that apart from information seeking for academic purposes, students also seek information for everyday life. Students seek information mainly on careers, finance, health, entertainment, sport, relationships, travel and transport, family, accommodation, legal issues, sexual abuse, crime, music, personal development, and religion. This finding in the survey about everyday life information seeking was confirmed in the large group discussions (Krubu et al. 2017). For example, respondents mentioned that if they wanted to know how to bake or how to remove stains from their clothes, they used Google.com to find answers. This resonates with the findings in the survey (Table 3) which reveal that students mostly consult Google.com in their everyday life information seeking followed by Wikipedia. Students also visit discussion forums such as the Nigerian website www.nairaland.com in order to meet their everyday life information seeking.

Of the 18 students who indicated “other” in Table 2, 11 sought information on religious issues, and six sought everyday life information on personal development while one looked for classical music. Studies by Savolainen

Table 2: Information needs of undergraduates (n=711)

Item	Number	%
Study related issue	435	61.0
Career	274	38.5
Money issue	179	25.0
Health	167	23.5
Entertainment or leisure	164	23.0
Sports/hobby	152	21.0
Relationship issue	136	19.0
Travel and transport	92	13.0
Family-related issues	88	12.0
Accommodation	81	11.0
Legal issue	40	5.6
Sexual abuse	27	3.8
Crime	25	3.5
Other	18	2.5

(1995), Fisher, Durrance and Hinton (2004), Ajiboye and Tella (2007), and Ejiwoye and Ayandare (2011) confirm that besides seeking information for academic purposes, students also seek information for everyday life concerns. Students could select more than one item giving rise to multiple answers.

Table 3: Information sources consulted in everyday life information seeking (n=711)

Item	Number	%
Google or another search engine	425	60.0
Wikipedia	216	30.0
Books in your own collection	164	23.0
Library books	159	22.0
Personal interaction with a professional	120	17.0
Newspaper articles	109	15.0
Email a friend or someone you trust	104	14.6
Facebook postings	97	13.6
Online discussion groups (listservs, chat rooms)	74	10.0
Journal articles	58	8.0
Blogs	54	7.6
University Web site	53	7.5
Other social media (e.g. Twitter, Delicious, SlideShare)	34	4.8
Non-governmental organisation Web sites	32	4.5
Government Web sites	22	3.0
Personal interaction with librarian (face to face or by email/sms)	8	1.0
Other	3	0.4

A significant majority of respondents use Google and other search engines and Wikipedia in their everyday life information seeking, as shown in Table 3. The number of those who consult a librarian is very low, similar to their academic information seeking due to the convenience of information access through their personal electronic device. This finding was reported in a larger study by Krubu (2015). The number of respondents who consulted social media such as Twitter and SlideShare is low; it implies that they are more familiar with Web 2.0 technologies such as Wikipedia, Facebook, discussion groups, and blogs. A surprising number of students still consult books and newspapers. Students could select more than one item giving rise to multiple answers in Table 3.

Research question two: What are the information infrastructure and resources available to undergraduates?

To answer the second research question, three sub-questions are addressed:

Ownership of personal electronic devices

Students owned smarts phones (474, 66%), followed by laptops/notebooks (323, 45%) iPads or other tablet devices (123, 17%), and desktop computers (82, 11%) (see Table 4). This fits with the findings of Dahlstrom (2012) in which undergraduates in the USA favoured the use of portable electronic devices such as phones, while nine out of ten had laptops. The 63 respondents who indicated "other" use Java phones which are also internet enabled. Students could select more than one device resulting in multiple answers.

Table 4: Ownership of personal electronic devices (n=711)

Item	**Number**	**%**
Smartphone	474	66.0
Laptop / notebook	323	45.0
iPad or another tablet device	123	17.0
Desktop computer	82	11.0
Other	63	9.0

What access to the internet do students have on and off campus?

Table 5 shows students' preference for online sources which raises the question of where and how they access the internet. A striking number of the respondents access the internet using the campus wi-fi (568, 80%) on their personal electronic devices (Table 5), followed by many who also access the internet at

home (394, 55%). However, the 43 respondents who indicated "other" did spell out in their responses that they bought internet bundles on their phone to enable them to use the internet. This confirms the research on students' information seeking by the New Media Consortium (2007), Dahlstrom (2012), and Agbo and Igwebuike (2016). The data provides support for the convenience school of thought as described by Connaway et al. (2011). Students could select more than one item giving rise to multiple answers.

Table 5: Access to the internet off and on campus (n=711)

Item	Number	%
My own laptop / notebook / iPad /tablet/phone - using WI-FI on campus	568	80.0
At home	394	55.0
Cybercafé - off campus	261	37.0
Library computers	147	21.0
Residence's (hostel's) computer labs	112	16.0
Campus computer labs	70	10.0
Other	43	6.0
I don't use the internet at all	2	0.28

What are the search tools and information sources mainly consulted by undergraduates?

As revealed in Figure 2, which summarises the responses to the question what search tools respondents had used in the academic assignment, the most common tool by far is Google (or any other search engine) (472, 66.4%), followed by Wikipedia (284, 40%) and a reading list from lecturers (278, 39%); also worth noting is the fact that they do consult classmates and friends as sources of information. This result is similar to the findings of Barker, Cook and Whang (2006) in their study of information sources consulted by University of Washington College Engineering students in which the use of Google or any other search engine ranks the highest as their information search tool, followed by their lecturer and then classmates as their sources of information. Students could select more than one tool resulting in multiple answers.

However, the OPAC and online bibliographic and full text databases seemed to be unpopular with the students. This may be linked to convenience, a crucial factor in the process of information seeking (Bawden and Vilar 2006; Griffiths and King 2008; Head and Eisenberg 2010; Connaway et al. 2011).

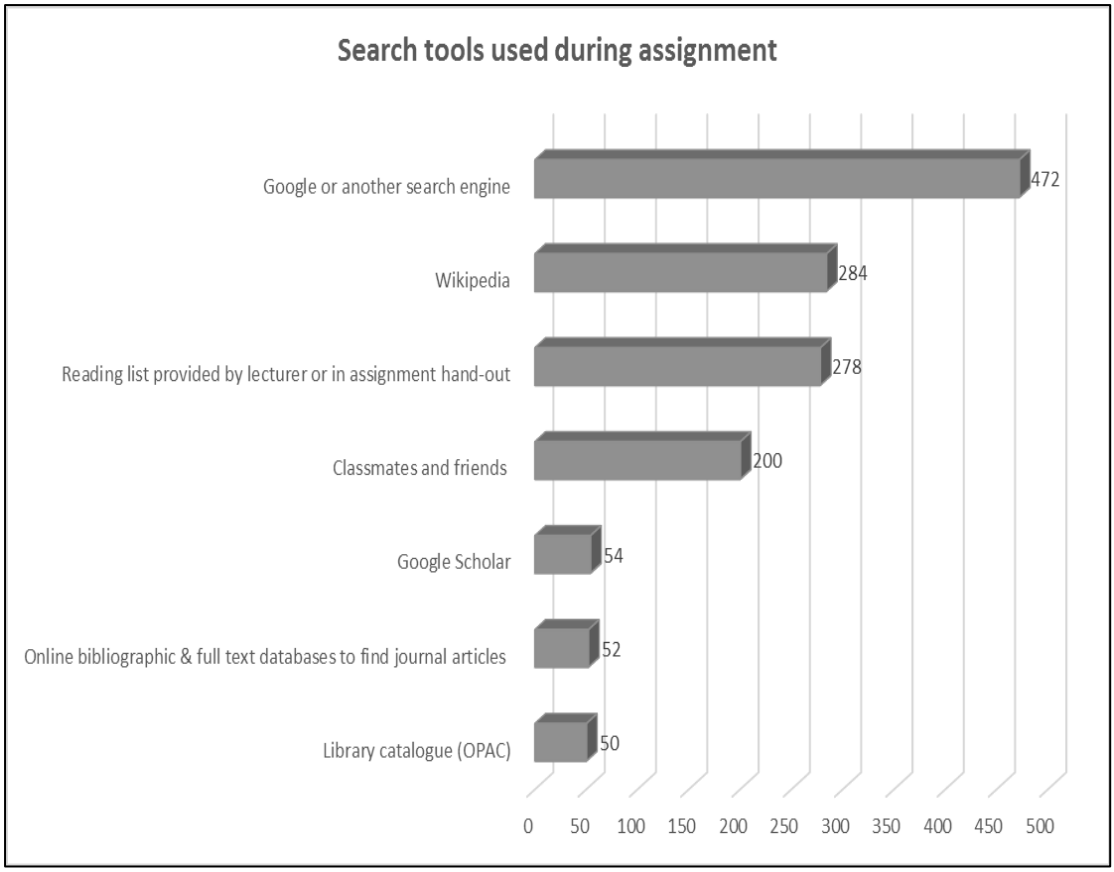

Figure 2: Search tools used during assignment (n=711)

Of the respondents 330 (46%) use course notes and 246 (35%) use print books in attending to their assignment as revealed in Figure 3. This appears to be in harmony with findings of Ejiwoye and Ayandare's (2011) investigation of the information seeking habits of undergraduate students of the Federal University of Technology, Ondo State, Nigeria. However, the latter study asserts that the reason why students consult course materials and print books is because of the erratic power supply which has negatively impacted on the use of the internet; this may affect the use of the library and its resources on campus. But this may not be the case with FUPRE students as a marked number of the respondents (66%) have smart phones and laptops or notebooks (45%).

As revealed in Figure 3, theses and dissertations, technical reports, journals, social media (Twitter, Delicious, SlideShare) and blogs appear not to be widely consulted information resources among the students for their assignments. Students could select more than one information resource resulting in multiple answers.

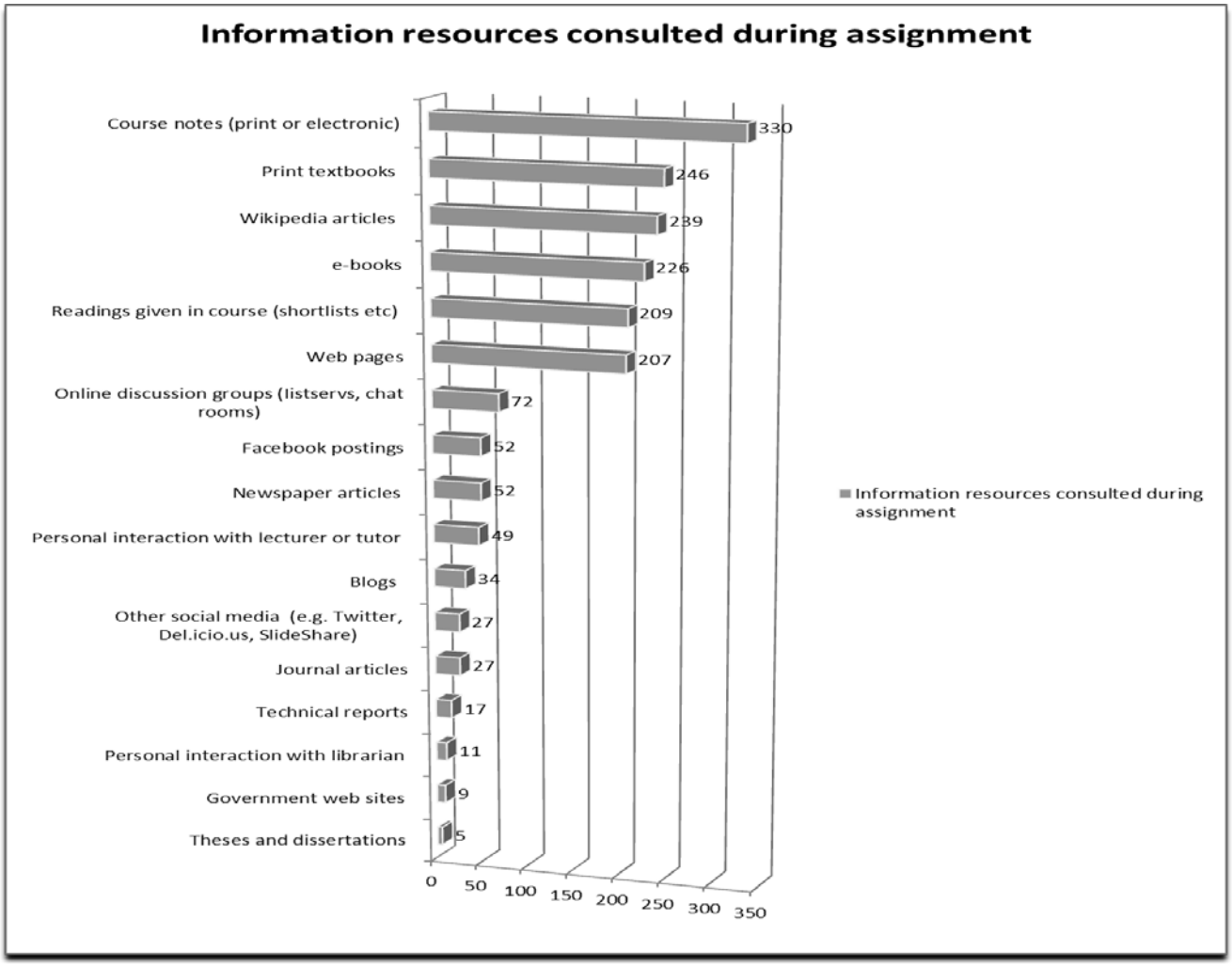

Figure 3: Information resources used during the assignment (n=711)

Research question three: What are the barriers that undergraduates experience in their information seeking?

Tables 6 and 7 address the barriers that undergraduates experience in their information seeking at the level of physical and intellectual access to information.

Physical access is the first level of access; it dominates the barriers to information seeking by undergraduates as revealed in Table 6. Irregular electricity supply is a major challenge that hinders respondents in their information seeking. The study of Ejiwoye and Ayandare (2011) on the information seeking behaviour of undergraduate students in three Nigerian universities found that electricity is a major barrier to undergraduates in information seeking. Another noteworthy challenge is poor access to information resources and lack of finance in terms of accessing funds to buy internet bundles for data. These were also expressed in the large group

discussions (Krubu 2016; Krubu et al. 2017). Chawinga's (2016; 2017) studies of social media usage in Malawian higher education confirms the barriers caused by very high costs of internet bundles. Some students experienced more than one barrier thereby indicating multiple answers.

Table 6: Factors that hinder information seeking (n=711)

Item	Number	%
Irregular electricity supply	349	49.0
Poor access to information resources	337	47.0
Lack of funds/finance	307	43.0
Lack of time	217	38.0
Poor infrastructure	157	22.0
Lack of search skills	100	14.0

Table 7 reveals that about 70% of the respondents experience technical problems (e.g. the system freezes, server down time, slow access speed) and the issue of inadequate facilities on campus. A barrier to intellectual access in the course of undertaking an assignment was revealed both in Tables 6 and 7 as lack of search skills. Some students experienced more than one problem thereby indicating multiple answers. The barriers to intellectual access explained by Burnett et al. (2008) and Burnett and Jaeger (2011) are discernible in students' problems (in the current study) with choosing appropriate subject headings, keywords and formulating a good search strategy (263, 33%) and choosing the most relevant database (119, 16%). Students could choose more than one problem giving rise to multiple answers.

Table 7: Problems encountered when using electronic resources during an assignment (n=711)

Item	Number	%
Technical problems (e.g. system freezes, server down time, access speed)	517	72.0
Not enough facilities on campus	265	37.0
Choosing appropriate subject headings, keywords, and formulating a good search strategy	236	33.0
Choosing appropriate database	119	16.0
Operating the physical devices	28	4.0
Other	29	4.1

Among the 29 respondents who indicated "other", 12 had internet connectivity problems, but two of them specifically said that the campus wifi was weak, which is similar to the first option in Table 7 about technical problems. Eight respondents indicated financial problems, that is, their inability to buy data bundles for personal internet access. The remaining nine complained about the internet "giving irrelevant answers to questions". This latter problem, according to Burnett et al. (2008) and Burnett and Jaeger (2011), is a reflection of the poor cognitive ability of the individual which translates into a lack of information literacy skills.

Information behaviour of undergraduates in the world of Web 2.0

This section presents data on the information behaviour of undergraduates in the world of Web 2.0. Responses revealed that a number of respondents explore some Web 2.0 tools in their everyday life information seeking. This section also indicates whether or not these tools are used for academic and other information seeking.

Social media platforms

Table 8 shows that students use social media platforms both for academic and entertainment purposes, but largely for entertainment purposes. Dahlstrom (2012) also found that, across 184 USA institutions, three out of every five students who participated in the studies both in 2011 and 2012, used social networks like Facebook and online forums for interacting with friends more than for academic communication.

The data presented in Table 8 reveal that respondents use Wikipedia for academic purposes. Dyaolu and Rifqah (2015) identified Wikipedia as a key information tool among undergraduates in their Lagos study. There seemed to be less use of email for entertainment purposes, probably because Facebook has features which incorporate email, photo-sharing, video and voice chats (Funk 2009).

Of the respondents 79 indicated "other" Web 2.0 tools for entertainment. They were Blackberry messenger (32, 4.5%), WhatsApp (61, 8.6%) and 2go(67, 9%). These mobile network platforms are for text (instant) messaging, audio and video sharing. Students could choose more than one social media platform giving rise to multiple answers.

Table 8: Social media platforms used for academic and entertainment purposes (n=711)

Item	Academic purposes		Entertainment purposes		Both	
	Number	%	Number	%	Number	%
Social networking (e.g. Facebook, Twitter)	124	17.0	579	81.0	422	59.0
Video sharing sites (e.g. YouTube)	38	5.0	167	23.5	68	10.0
Photo sharing sites (e.g. Flickr)	18	2.5	113	16.0	15	2.0
Blogs (Weblog, moblog and diaries)	18	2.5	80	11.0	19	2.7
Online discussion forums e.g. Yahoo group, Google circles	98	13.8	83	11.7	34	4.8
Email (e.g. Gmail)	154	21.7	90	12.7	56	8.0
Virtual worlds (e.g. Second life, Sims)	83	11.7	63	8.9	34	4.8
Wikis (e.g. Wikipedia)	408	57.0	37	5.0	4	0.6
Slide sharing sites (e.g SlideShare)	28	3.9	32	4.5	10	1.4
Other	-	-	79	11.0	-	-

Table 9 is a cross tabulation of social media platforms used for academic purposes only versus level of student. The cross tabulation was used to determine any similarities or differences in their use of social media for academic purposes. The 100 level students appear to be more engaged with email, social networking sites and online discussion forums than the third year students. Notably, the 300 level students use Wikipedia more than the first year students.

It is surprising to see that a sizeable number of students do take advantage of virtual worlds such as Second life and Sims despite the challenge of internet access. Nonetheless, Sims 3 and Sims 4 released in 2009 and 2014 respectively can be accessed offline (http://www.thesims.com/) while Second Life is an online virtual world (http://www.secondlife.com/). However, there are cheap bundles sold by telecommunication service providers for night calls and night browsing which students do use, as mentioned during WhatsApp chats with some students in the Department of Petroleum and Electrical Electronics Departments **(**Krubu et al. 2017).

Table 9: Social media platforms used for academic purposes (n=711)

Item	100 level		300 level		Grand Total	
	Number	%	Number	%	Number	%
Wikis (e.g. Wikipedia)	90	12.7	178	25.0	268	37.7
Email	98	13.8	56	8.0	154	21.7
Social networking (e.g. Facebook, Twitter)	79	11.0	45	6.0	124	17.0
Online discussion forums eg. Yahoo group, Google circles	63	8.9	35	4.9	98	13.8
Virtual worlds (e.g. Second life, Sims)	36	5.0	47	6.6	83	11.7
Video sharing sites (e.g. YouTube)	20	2.8	118	16.6	138	19.0
Slide sharing sites (e.g. SlideShare)	15	2.0	13	1.8	28	3.9
Photo sharing sites (e.g. Flickr)	10	1.4	8	1.0	18	2.5
Blogs (Weblog, moblog and diaries)	6	0.8	12	1.7	18	2.5

The use of social media by undergraduates both for entertainment and education may imply that they are *digital natives* (Tapscott 2009), part of the *Net Generation* - the first generation to grow up in a global environment that was already connected before they were born. They are also referred to as the *native speakers* who speak the digital language of computers, video games and the internet (Prensky 2001; Bennett, Maton and Kervin 2008). Multiple answers are reflected in Table 9.

Web 2.0 platforms incorporated into teaching and learning

For the 100 level students, the number of those who indicated that their lecturers incorporate Web 2.0 tools in their teaching and learning is low compared to 300 level, as shown in Table 10. Not all of the 711 students responded to the question resulting in 629 responses.

Table 10: Web 2.0 platforms incorporated in teaching and learning by lecturers (n=629**)**

Item	100 level		300 level		Grand Total	
	Number	%	Number	%	Number	%
Yes	47	7.5	158	25.1	205	32.6
No	272	43.2	152	24.2	424	67.4

Upon request, 177 of 208 students specified the Web 2.0 tools incorporated in their teaching and learning by lecturers as follows: Wikipedia - 151; Email - 79; Blogs - 11. Of the 79 who indicated Gmail, one wrote: “just to receive emails”.

The vast majority of students do make entries on social media platforms, in the form of text, and uploading of photos (90%). Web 2.0 encourages creativity, interaction and constructivist active learning rather than merely consuming information as in Web 1.0. However, fewer upload videos and audio, while even fewer respondents actually blog (12%) as evident on Table 10. Respondents preferred the quick chatting and interactions on Facebook.

Conclusion and recommendations

Apart from seeking information for academic purposes, the data analysed also revealed that students not only engage in information seeking for academic purposes but also for their everyday life; this aligns with the research of Savolainen (1995). FUPRE students engage in everyday life information seeking; the top three on the list are career, money and health issues. The findings reveal that the common ground between the academic and everyday life information seeking is the use of the Google search engine and Wikipedia.

With regard to students’ preferences in terms of sources and resources, the findings indicate an overwhelming preference for online resources such as Google and Wikipedia. The data provide support for the convenience school of thought as described by Connaway at al. (2011).

Regarding the problems students experience in their information seeking, physical and intellectual barriers were revealed in the questionnaire survey. The primary barrier was physical, relating to technical issues such as the system freezing, server down time, access speed, and erratic power supply. The intellectual barriers concerned students’ inabilities to choose appropriate subject headings and keywords, to formulate search strategies, and to choose appropriate databases. Burnett et al. (2008) and Burnett and Jaeger (2011) point out that physical access is a precondition to intellectual access and problems with both constitute a major barrier to information seeking. The intellectual barrier is an individual problem which translates to lack of information literacy skills.

The majority of the students own electronic devices and top of the list is a smart phone owned by two out of three, followed by a laptop or notebook and tablet device. This might explain the popular use of social media among the respondents. It seems, however, that they are more in use for entertainment than for academic purposes. The top three Web 2.0 platforms on the list for

entertainment are social networking sites (Facebook and Twitter), video sharing sites (YouTube) and Photo sharing sites (Flickr). For academic purposes, the top three are Wikipedia, email (Gmail) and social networking sites such as Facebook and Twitter.

Only about half of the 300 level students mention that their lecturers incorporate Web 2.0 tools in their teaching and learning, while for the 100 level students, the number is very low (less than a quarter).

These findings show that undergraduates are abreast of the use of emerging technologies, but they need to acquire information literacy skills to be relevant in the 21st century workplace.

As information behaviour is a subjective sense making process, there is a huge demand for undergraduates to keep abreast of emerging technologies for life-long learning and information literacy skills. These are critical graduate attributes required in the work place in Nigeria, and in the world at large. These skills should be evident against the background of optimal participation in the Knowledge Economy of NV20:2020, and informs the fundamental question of this research which explored whether the Nigerian undergraduates have the ability and requisite skills to use the 21st century resources available for both personal and academic development, which by extension translates to national development.

The Federal University of Petroleum Resources, Effurun – Delta State, Nigeria, was the case site of this study. It is a specialised university, the only one of its kind in Nigeria and Africa, established primarily to meet the workforce demands of the petroleum industry in Nigeria. The petroleum industry, being the largest industry and the main generator of Gross Domestic Product (GDP), with the strategic position of the specialised university in national development, makes a compelling argument for its appropriateness as a case site.

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