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Internet information seeking and use by Medical Students of Nnamdi Azikiwe University, Nigeria.

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Every form of information resource needed to support academics is available on the Internet both retrospective and current. The research determined information seeking and use of the Internet by medical students of the College of Health Sciences, Nnamdi Azikiwe University, Nnewi, Nigeria. Data was collected using a questionnaire. Sample was 161 clinical students in 400 to 600 levels of study. Result shows that Internet was used daily by 72% of the respondents. Internet was used mainly to search for medical information (82%), social media communication, (77.6%) and for course assignments (62.2%). There is low use of academic resources such as online databases, e-journals, e-books and library websites to find information. The most frequently used website is Wikipedia (30.4%). This is followed by Medscape (25.5%) and PubMed (20.5%). Lack of Internet access (81.3%) was a barrier to the effective use of the Internet by the medical students. Other barriers identified by the respondents include: restriction of important information for payment (78.3%) and too many results returned for search (70.8%). The study concluded that Medical librarians have a role in improving students' use of educational resources on the Internet through an extensive and curriculum based information literacy programme.

Keywords: Internet use, medical students, medical education, information seeking behaviour.

INTRODUCTION

Students are at great advantage in the twenty first century in their academic endeavours because of the Internet which is proving to be an incomparable information resource for learning and research. Every form of information resource needed to support academics is available on the Internet both retrospective and current. For medical students, many of the tools that support and transmit medical education and health research are now available online. There are e-book, e-journals, subject databases, academic and professional websites with numerous educational resources. Jadoon et al. (2011) described the Internet as an important learning tool in medical education by providing access to latest evidence anytime and anywhere. It is especially useful for students from developing countries helping them to keep abreast of ever expanding knowledge bridging the gap resulting from scarcity of resources. Geissbuhler and Boyer (2006) also noted that as a

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collaborative work tool, the use of the Internet is now essential for biomedical research and for the development of health systems. Advanced information retrieval technologies integrating scattered databases give new meaning to knowledge management

Apart from creating easy availability of information resources that support education, the Internet as a digital object is a tool that has enriched the learning experience by giving new forms of access to information. As a multimedia education resource, students are benefiting from the wide range of interactive objects offered by the materials in the Internet. Chowdhury (1999) noted that the multimedia and hypermedia features have made the Internet particularly suitable for distant learning and self education. Computer – aided instruction packages and 'virtual' universities, etc., have opened new possibilities in the teaching and research environments throughout the globe.

Social media platforms and networking on the Internet is also a tool for exchange of ideas and knowledge sharing by students. World Federation for Medical Education (WFME), 1998 recognizes the potentials of computers and Internet in medical education. They noted that the computer with its capacity for managing information and linking is the most powerful tool for processing medical knowledge and opens new avenues to the teaching and learning process. It is also a knowledge sharing tool which through linking local networks allow institutions to collaborate worldwide and exchange teaching materials and ideas.

With these resources easily available online, students can now find information to solve a learning or research problem on any topic and improve their knowledge. They can also do their assignments with ease. This makes the Internet a great tool for education and research.

Medical Students Use of the Internet

Despite the fact that the Internet is a rich information resource that can support medical education, internationally, many reports show that medical students predominantly use the Internet for non medical and educational purposes such as social media, email and surfing. Lal et al. (2006) in a research on Internet use among medical students and residents of a medical college of North India ranked medical students use of the Internet as e-mail surfing, chatting, entertainment and education. Ghabili and Alizadeh (2008) in a study of computer and Internet use among 320 Iranian medical students reported that connection to the Internet by the students was largely for non-scientific purposes. A third used it for recreational purposes. The researchers suggested that curriculum supervisors and medical trainers should revise the current medical curriculum by adding courses in computer skills or search skills to

current educational programmes. Maroof et al. (2012) assessed how medical students were using the computer and Internet and found that the main use of the Internet was for communication (58.5%) and entertainment, that is, downloading movies and games (46.3%). Report by Kumar (2012) on application of information and communication technology by medical students in Chandigarh, India showed that 65.95% of the students use the Internet for scanning the available literature, while 63.82% use it for the purposes of sending and receiving e-mail. 34.04% use it for online chatting with their friends. Kommula and Kusneniwar (2013) found that 64.9 % Medical Students of Mediciti Institute of Medical Sciences, Andhra Pradesh, India have an account in social networking sites like Facebook and Orkut. However, over half the students 56.7% have no knowledge about medical education websites. The study concluded that training in computing skills and information regarding medical education websites are required to enable better utilization of digital resources by medical students. Similarly, in the study by Chathoth et al. (2013) on Internet behaviour pattern in undergraduate medical students in Mangalore, the most common purpose for Internet use was found to be social networking (97.8%), followed closely by e-mailing (87.8%).

However, some studies show predominant use of the Internet by medical students for academic and research purposes. Jadoon et al. (2011) evaluated Internet access and utilization by medical students in Lahore, Pakistan; and reported that about two third of the students (61.0%) use Internet for both academic and professional activities. Akporido (2014) studied Medical Students Use of Internet in College of Health Sciences, Delta State University, Abraka, Nigeria and found that all respondents (100%) use the Internet for email and research.

Nnamdi Azikiwe University is a Federal Government owned tertiary institution situated in Anambra State, Nigeria. Though researches on the use of the Internet by medical students have been carried out in many institutions in several countries, little is known about its use by medical students in this institution. The Internet is now an undisputable tool in medical education and health practice. It is imperative to find out how this group of students are maximally utilizing the tool that has potentials to enrich their learning experience as well as build their knowledge base. Data collected will provide an insight into the information seeking behaviour of the students on the internet and possibly establish gaps and barriers that need to be addressed so that the students can effectively use the Internet in their studies.

Objectives

The main purpose of the study was to determine the

Table 1. Respondents' demography.

Gender	Frequency	%
Male	113	70.2
Female	48	29.8
Ages of Respondents		
20-24	76	47.2
25-29	68	42.2
30-35	10	6.2
36 and above	2	1.3
Missing	5	3.1
Level of Study		
400	31	19.3
500	48	29.8
600	82	50.9

n=161

pattern of use of the Internet by the medical students of Nnamdi Azikiwe University. Specifically, the research determined:

1. Frequency of use of internet
2. Internet search skills of the medical students
3. Activities on the Internet
4. The most consulted websites for academic studies
5. Subject pattern of e-book access through the Internet
6. The benefits of the Internet to the medical students' academic career
7. Barriers encountered by the medical students in accessing the Internet for academics

Research questions

The following research questions guided the study:

1. What is the frequency of use of the internet by the medical students?
2. What is the Internet search skill of the medical students?
3. What activities do the medical students undertake on the Internet?
4. What are the most consulted websites for academic studies?
5. What is the subject pattern of e-book access through the Internet?
6. What are the benefits of the Internet to the medical students' academic career?
7. What are barriers encountered by the medical students in accessing the Internet for academic purposes?

METHOD

The survey research method was used for this study. The study was carried out in the Faculty of Medicine, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus. The research focused on clinical students of the faculty on 400 to 600 level. Data was collected using the questionnaire instrument. The Questionnaires (α = .846) were distributed to the medical students in their various classrooms and in the medical library. Two hundred copies of the questionnaire were distributed, a total of 161(80.5%) usable questionnaires were collected. Results were analyzed using simple percent and mean score. Analysis was done using SPSS version 17.

RESULTS

Respondents' demography is shown in Table 1. A higher percentage of the respondents were male 113 (70.2%), as compared to female 48 (29.8%). Majority of the respondents 76 (47.2.3%) were aged 20 to 24 years and 68 (42.2%) were aged 25-29. 10(6.2%) were aged 30-35, and 2(1.3%) 36 years and above. On level of study, about half (50.9%) were in the final year.

Access to the Internet

Respondents' access pattern and Internet search skills is shown in Table 2. Results as shown in Table 2 indicates that 117 (72.7%) of the student have personal computers (Laptop). 142 (88.2%) have access to the Internet. Majority (73.3%) of the students access the Internet through the Smartphone. There is no access from the faculty and Library. This is expected because the Internet facility of the College is currently not functional.

On frequency of use, Internet was used daily by 116(72%) of the respondents. It was used two to three times a week by 29 (18%) of the respondents. 5 (3.1%) never use the Internet to search for information.

On Internet search skills, Majority 88(54.7%) rated their skills as proficient. Few 7 (4.4%) had no skills.

The most satisfactory information resource used for search

The students were asked to indicate which information resource gives the most satisfaction when searching for information. Result is shown in Table 3. The table shows that majority 121(74.5%) of the respondents indicated that the Internet gives them the most satisfaction when searching for information. 37 (23%) prefer print books and journals. Only 4 (2.5%) considered CD-ROM as the most satisfactory information resource.

Activities on the internet

Respondents were asked to rate the frequency of various

Table 2. Access to the Internet.

	Frequency	%
Have personal computers		
Yes	117	72.7
No	41	25.5
Missing	3	1.8
Have access to the Internet		
Yes	142	88.2
No	19	11.8
Internet Access Points*		
Smartphone	118	73.3
home facilities	69	42.9
cyber café	36	22.4
other students	26	16.2
Faculty and Medical Library	Nil	Nil
Frequency of Internet Use		
Daily	116	72
2 to 3 times a week	29	18
At least monthly	8	5.0
Never	5	3.1
Missing	3	1.8
Internet search skills		
Very Proficient	41	25.5
Proficient	88	54.7
Little Skills	25	15.5
No skills	7	4.4

* Response not mutually exclusive.

Table 3. The most satisfactory information resource used for search.

Information resource	Frequency	%
Printed Books / journals	37	23
Internet resources	121	74.5
CD ROM resources	4	2.5

activities on the Internet on a four point scale of very often to never. Result is shown in Table 4. Percentage score in Table 4 indicates that the Internet is regularly used by the respondents for searching for medical information (82%), social media communication, (77.6%) course assignment (62.2%) and sending and receiving e-mail (57.2%). Notably a substantial percentage never consulted online databases (41.6%), read or downloaded e-books (42.9%), accessed e-journals (41%) or visited library websites (68.9%).

Most consulted websites for academic studies

Respondent were asked to list three websites they consult most frequently for academic studies. Result in Table 5 shows that the most frequently consulted website by the students is Wikipedia. This is followed by

Table 4. Rate of use of the Internet for activities.

Activities	Very often/often	Occasional	Never	Mean	Std. D
Search for academic medical information	132(82)	23(14.3)	6(3.7)	3.21	0.83
Use social media e.g. Facebook, Chat	125(77.6)	20(12.5)	16(9.9)	3.26	1.04
Course assignment	100(62.2)	53(32.8)	8(5.0)	2.93	0.97
Send and receive e-mail	92(57.2)	52(32.3)	17(10.5)	2.75	1.01
Read newspapers	90(55.9)	53(32.9)	18(11.2)	2.8	1.07
To get Research information	87(54.1)	64(39.7)	10(6.2)	3.03	0.99
Use Online databases e.g., PubMed	42(26.1)	52(32.3)	67(41.6)	1.89	0.93
access electronic books	39(24.2)	53(32.9)	69(42.9)	1.88	0.97
Use e-journals	33(20.5)	58(36)	66(41)	1.82	0.92
Visit library websites	21(13.1)	29(18.00)	111(68.9)	1.47	0.87

Table 5. Three most consulted websites for academic studies.

Website	Frequency	%
Wikipedia	49	30.4
Medscape / E-medicine	41	25.5
PubMed	33	20.5

Table 6. Respondents' Downloading of E-books through the Internet by Subjects.

	Frequency	%
Internal Medicine	34	21.1
Pathology	27	16.8
Pharmacology	25	15.5
Paediatrics	24	14.9
Surgery	24	14.9
Obstetrics and Gynaecology	23	14.3
Ophthalmology	22	13.7
Community medicine	21	13
Radiology	20	12.4
Anaesthesiology	15	9.3

Medscape/E-medicine and PubMed.

Access to e-books in medicine through the Internet

Respondents were requested to indicate subjects to which they have downloaded e-books for study. The result is shown in Table 6.

Table 6 shows that the most downloaded subjects by the students are Internal Medicine 34 (21.1%), Pathology 27 (16.8%) and Pharmacology 25 (15.5%). Anaesthesiology 15 (9.3%) is the least downloaded subject.

Benefit of the Internet to Academic studies

Respondents were asked to indicate the benefits of the Internet to their academic studies.

Results in Table 7 shows that large majority indicated that easy access to information (81.3%), faster access to

Table 7. Benefits of the Internet to Respondents' Academic Studies.

	Yes	%
Easier access to information	134	83.2
Faster access to information	131	81.3
Access to current information	128	79.5
Access to a wider range of information	127	78.9

Table 8. Barriers to using the Internet.

Barriers	Yes	%
Lack of Internet access	131	81.3
Important information I need on the Internet are restricted for payment	126	78.3
Too many results returned for my search	114	70.8
I find it difficult to get local information from the Internet	108	67.1
Limited access to a computer	99	61.4
Information I find are too technical and foreign for my use	84	52.2
Lack of Internet search skills for effective search	72	44.7

information (83.2%), access to current information (79.5%) and access to wider range of information (78.9%) are the benefits of the Internet to their academic work.

Barriers to using the Internet

Respondents were asked to indicate barriers to the use of the Internet for academic studies. The Result is shown in Table 8. As shown in the table, the major barrier to use of the Internet for academic purposes is lack of Internet access (81.3%). Other barriers include restriction of important information for payment (78.3%) and too many results returned for my search (70.8%).

DISCUSSION

The research determined pattern of information seeking and use of the Internet by medical students of Nnamdi Azikiwe University. Results show that 88.2% have access to the Internet. Internet was used daily by 72% of the respondents and this access is mainly through their smart phones. This pattern of use is consistent with the findings of Aggarwal et al. (2015) where 78.57% of the medical students use Internet daily and majority access the internet through their phones. This appears to show increasing preference and shift in sources of access to hand held devices. The rate of use is however higher than that of Singh et al. (2013) where only 51.2% respondents used it daily.

The students were asked to indicate their level of

Internet search skill which is very essential for them to access educational and research resources on the Internet. 80.2% gave a high rating of their Internet search skills as proficient, and very proficient.

The Internet was highly rated by the medical students as an information resource. It gives majority of the students the most satisfaction when searching for information with 74.5% of the respondents preferring the Internet compared to 23% that prefer print books and journals. This percentage of preference for the Internet is higher than that found by Unnikrishnan et al. (2008) where 42% of the respondents prefer the Internet and 24% textbooks. This is not unexpected considering the wide diffusion of the Internet in the past five years.

On Internet activities, percentage score shows that the Internet is highly used by the respondents for searching for medical information (82%), social media communi-cation, (77.6%) course assignment (62.2%) and sending and receiving e-mail (57.2%). This pattern of use is different from earlier findings (Parashar and Bansalm, 2012; Ghabili and Alizadeh, 2008) which showed that the main use of the Internet was for recreation, communi-cation and entertainment. Notably, the Internet is highly used for medical information and course assignment, but there is low use of online databases, e-journals, e-books and library websites. This implies that students may not be accessing quality information from the subject databases specifically developed for the purpose. Kommula and Kusneniwar (2013) also reported that 56.7% of the students have no knowledge about medical education websites. For Jadoon et al (2011) it was only 34% that posses the knowledge. They researchers noted that there is under utilization of the potential of Internet

resources to augment learning. Increase in awareness, availability of requisite facilities and training in computing skills are required to enable better utilization of digital resources by medical students.

Textbooks are major information resource for students. Many of the core medical texts are now available in e-format and are accessible through the Internet either for free download or on payment. 82 (50.9%) indicate downloading their medical text through the Internet. Internal Medicine 34 (21.1%), Pathology 27 (16.8%) and Pharmacology 25(15.5%) are the most downloaded subjects by the students. Anaesthesiology 15 (9.3%) was the least. Though the percentage of downloading for the medical subjects is small, it shows a growing awareness and acceptance of the e-book format.

The major barrier to the use of the Internet for the medical students was lack of Internet access (81.3%). This is not unexpected because the Internet facility in the College is currently not functional so students source for their own Internet services. This is an important issue that needs to be rectified to ease the problem and costs these students face in accessing the Internet for their education. Another barrier raised by the students is on subscription based publications which deny access to important information they need on the Internet (78.3). This is an issue because many quality journals and textbooks are subscription based and available for purchase with foreign currency. Many of the students may not afford the cost. A good percentage of the students also indicated that too many results are returned for search (70.8%). This may be the result of poor information search skills. Good information search skill may help the students to filter search results for precision.

The study established that the medical students of the institution use the Internet for academic purposes not just for social networking. This is a good development; however this needs to be channelled to the use of academic and subject bibliographic databases relevant to medical education. Medical librarians in the institution have a role to create awareness as well as impart skills that are needed to harness quality medical information resources on the Internet. Therefore there is need for a well organized information literacy programme that will empower the students to use the Internet effectively in their education.

Conclusion

For learning and research in today's academic world, the Internet has brought lots of information resources that fully support the acquisition of knowledge. Results of the research show that even though the medical students use the Internet highly to access medical and research information, there is low use of quality information resources such as online subject databases, e-books, e-

journals and library websites. They need to be aware of these resources in order to utilize them. Medical librarians have a role in improving students' use of educational resources on the Internet through an extensive and curriculum based information literacy programme. This is highly needed considering the growing concern on the quality of information on the open net.

Conflict of Interests

The authors have not declared any conflict of interests.

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