Library and Information Science (LIS) Students Competency in Evaluating Information and Information Resources in Universities in Nigeria

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Abstract
The purpose of the study is to assess the undergraduates' competency to evaluate information and information resources for credible information. The study adopted descriptive survey method. A questionnaire tagged 'Library and Information Science Students' Competency in Evaluating Information Resources Questionnaire (LISSCEIRQ)'was designed to collect data from 806 undergraduates in seven universities offering Library and Information Science in the South-East and South-South regions, Nigeria. The study found that undergraduates in LIS verify the information they retrieve by checking the authors' name and qualification before using it. They also rated currency of the work, relevance of the content, scholarly/professional and overall quality of the information as important when evaluating information. It also emerged that the undergraduate students do not pay attention to elements such as the publisher, the author's affiliation and cited references when determining good sources of information. The findings from the study will inform librarians and information literacy instructors on the skills undergraduates needed to enable them evaluate and use only credible information. It will also inform librarians, and library administrators to re-design their information literacy programmes to include competencies needed by students to evaluate information and information resources.

Keyword (s): information evaluation, information literacy skills, websites, undergraduates, universities, Nigeria.

Introduction

Information users are confronted with an avalanche of information from different kinds of sources making it difficult to verify their authenticity. However, students have stronger need to be able to identify what is relevant for learning and recreational purposes as exposure to too much information may be counter-productive as a result of information overload (Yan, Sha, Yan, & Shang, 2015). Being faced with so much information, students run into the risk of using the information without thinking critically about it. One major strategy for dealing with information overload is filtering. According to Belanger, Slyke and Crossler (2019) filtering information involves knowing what information we need and what information merits attention and use, which makes being able to evaluate information a critical skill in today's information-rich world. With the tremendous amount of information available today, information evaluation becomes an important skill.

Information Literacy (IL) provides students with the critical skills needed to find and evaluate the information they need for their academic work and personal lives (ACRL, 2005).According to Association of College and Research Libraries (ACRL, 2005) "[. . .] to be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information."The information literate student knows how to learn because they know how knowledge is organized, how to find information and how to evaluate information resources for credible information. Information literacy is important particularly in this age because it enables us to analyze and evaluate the information we find, thus giving us confidence in using that information to make a decision or create a product (ACRL, 2005).An information literate student is deemed by the Association of College and Research Libraries (2005) to be one who can 'evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias'. Similarly, Keene, Colvin and Sissons (2010) noted the particular importance of relevance, timeliness and authority when presenting the Colvin-Keene IL model.

Despite the awareness of the relevance of IL among library professionals culminating innumerous studies by researchers around the world, there is little, if any that is dedicated to the competencies needed by LIS students in Nigerian universities to effectively evaluate information resources online for credible information. Most of the existing studies pointed out to students' poor evaluation

skills as are sult of over-concentration on lower-order IL outcomes. For example, Chang et al. (2012) developed a scale to measure the IL skills of students in Singapore and found, among others, that most of their respondents possessed lower-order IL skills in information seeking than higher-level skills such as evaluation. Similarly, the study from the University of Botswana to determine the level of integration of information literacy within its academic programs revealed among other things that most of the students:

> Were ill-equipped with requisite information literacy skills such as ability to identify, locate, evaluate, select, and apply information needed for their studies and in the work environment; had difficulties in critically evaluating, analyzing, and examining the information coming their way, etc.(Mutula, Wamukoya, &Zulu, 2004, p.3).

It is not clear whether undergraduates of LIS in Nigerian universities have the necessary competencies to evaluate available online information resources effectively. Additionally, "digital natives" often lack the ability to effectively use the vast array of information sources now available to them, they rely heavily on search engines and some questionable tertiary sources such as Wikipedia (Rowland et al., 2008). If undergraduates are exposed to high quality and credible resources which improves their critical thinking skills, they would learn to evaluate these resources by comparing them with simple Google search results. Also, if students are taught how to be their own internet detectives while choosing the most appropriate resources for their research paper, they will end up using credible information that is relevant to meet their information needs (Rowland et al., 2008).When that is done, students will walk away with valuable lifelong learning skills which will help them in their academics and later on in their personal and professional life. It is assumed that undergraduate students do not evaluate rigorously the information they come in contact with, they tend to assume that the information they find is true and valid. That is why the researchers are interested in assessing the competencies students of library and information science (LIS) in universities in Nigeria possess to effectively evaluate information and information resources for credible information. To do this, the following research questions are raised to guide the study:

RQ1. What factors do students of LIS consider when verifying the quality of the

information they find before using them?

RQ2. How do the students determine good information resources?

RQ3. What factors do students of LIS consider when evaluating information **on a** website?

RQ4. What information websites do students turn-to first for credible and reliable information when conducting research to complete assignment/project?

Literature Review

Students' ability to verify the quality of information before use

Studies have shown that information evaluation skill is poor among students (Rowland et al., 2008;Faix, 2014; Ngo, Pickard, & Walton, 2019; Kattenbeck & Elsweiler, 2019).The study by Ngo, Pickard and Walton (2019) revealed that out of the four information literacy testing areas, information evaluation was the area where students performed most poorly (mean score: 38.36). They had better performance in the three other information literacy components (developing search strategies with mean score: 43.28, using English to engage with information effectively with mean score: 49.40 and using information ethically with mean score: 60.11). Students' ability to evaluate the resources used in research is important to their academic life. Based on research carried out in the UK in 2007, Rowlands and others, concluded that the speed with which young people searched the Web, indicated that “little time was spent in evaluating information, either for relevance, accuracy or authority” (Rowland et al., 2008).Information evaluation is the systematic determination of the merit and worth of information (Belanger, Slyke, & Crossler, 2019).Helping students to locate, identify, evaluate and use information is a concern of both librarians and faculty because even when students were able to analyze a source to determine whether it was scholarly or popular, they often did not correctly identify which specific type of source it was (Faix, 2014). Heinstrom (2006) discovered that, in a school situation, intrinsically motivated youngsters, who have a genuine desire to learn, are more 'attentive to information quality' than extrinsically motivated pupils, whose priority is simply to gather enough material to meet the requirements of the set task.

In evaluating the credibility of information sources there are several key criteria to consider: the authority of the author, the background of the publisher, the objectivity of the author, the quality of the work, the currency of the work, the relevance of the work, among others. The study by Kattenbeck and Elsweiler

(2019) on 'understanding credibility judgments for web search Snippets' reveals that users are very uncertain when assessing credibility and their impressions often diverge from objective judges who have fact checked the sources. The most notable finding was not how decisions were based, rather, how inaccurate and uncertain participants were in their judgments. According to Kattenbeck and Elsweiler (2019), teaching undergraduates how to critically evaluate web pages involves not only assessing aspects of authority, accuracy, objectivity, currency and coverage, but also doing so in an analytical fashion, promoting peer-reviewed and editorially reviewed resources, as well as using further sources to compare and corroborate contained facts.

Williams and Rowlands (2007) maintained that, essentially, there are two aspects associated with the evaluation of material, namely judging its relevance and assessing its quality and authority. According to Eisenberg, Lowe, and Spitzer (2004), in addition to accessing and using information, 'evaluating material forms one of the three skills that are essential for survival in the Information Age'. It is a known fact that not all information available and especially on the internet is authentic. Information is available in a multiple media such as graphical, aural, and textual. These pose special challenges for students in terms of evaluating, understanding, and using information in an ethical and legal manner (Bundy, 2004). Johnson and Lamb (2003) suggest that it is imperative for students to learn how to evaluate the quality of information they find on the web and any other information available elsewhere.

Currie, Devlin, Emde, and Graves (2010) studied "undergraduate search strategies and evaluation criteria" in the United States of America. The study found that students did not use as many of the criteria necessary for evaluating sources for a research paper. Similarly, Head and Eisenberg (2009) studied how students resolved issues of credibility, authority, relevance and currency of resources used for course-related research and for “everyday life research”. The latter is defined as ongoing information seeking strategies for solving problems that may arise in daily activities. The study revealed that students reported twice as many frustrations with conducting course-related research as they did with “everyday life research”. They also expressed frustration with identifying, accessing, and/or locating resources in the library. The study by Brown (2001) also discussed the lack of searching skills and information evaluation skills among students.

Determining good information resources

In evaluating the credibility of information source, there are several criteria to consider.

Taylor, (2007: p. 10) identified some of the elements to help you determine the author's authority, which will give you an idea about the credibility of the information:

- *Expertise:* look for signs that the author is an expert in the topic area and brings knowledge to the material. Expertise can come from academic degrees, work experience, previous publications, and extensive research. Consider conducting an internet search using the author's name to find organizations the author is associated with, other publications he or she has written, news stories about the author, or other references.
- *Academic background and credentials:* look for evidence that the author has a credible academic background and qualifications for writing on the topic. Self-proclaimed experts or those who have little idea about a topic may not be qualified to write about it. In research, a credible author might have a Ph.D. or at least a Master's degree in a related field signifying that he or she conducts research or teaches in the area.
- *Work-related or other experience:* in the business world, clues to credibility might be evident in work experience rather than academic credentials. Many credible websites have "Biography" sections listing the author's work-related experience. You can also conduct an internet search to see if the author's name is associated with a company or professional organization.
- *Licensure or certification:* in some areas, an author might have a license or certification in a specific area, such as an MCSE (Microsoft Certified Systems Engineer), meaning that he or she has passed an examination in Microsoft operating systems.
- *Affiliation:* look for the author's affiliations, such as with academic institutions, professional organizations, government agencies, and other professional groups. Authors who are affiliated with recognized organizations tend to be more credible.
- *Other publications:* in some cases, it is useful to find out what other publications the author has produced or contributed to. A simple search using the author's full name in quotes on www.google.com may turn up additional publications. Books and articles typically have "About the Author" information on the article or book jacket that provides a list of the

author's previous publications. Reputable authors also are often cited by other scholars.

- *Contact information:* In many publications, information about the author is available so you can contact the author either directly or through the publisher of the resource. Look for telephone numbers, mailing addresses, and e-mail addresses. Note that, only an e-mail address with no other information is not sufficient for assessing an author's credibility because anyone can easily create an e-mail address.

Burton and Chadwick (2000) designed a survey and asked students regarding the criteria used when they evaluate sources on the internet and in the library. Students in this study said that the most desirable source for them was a source that is easy to find, easy to access, easy to understand, and available when it is needed. They also placed a high value on up-to-date information, primary sources, reputation of the publication and the author, but they were not concerned about publisher's reputation. Twait (2005) studied the source selection criteria identified by 13 undergraduates, and found that students primarily valued the content of the source, and also ranked familiarity and availability as important. Moreover, very few students ranked reputation/credibility as important. The author concluded that evaluation skills are lacking and are needed by the undergraduates. Hung (2004) also investigated how undergraduates evaluated five web pages using five evaluation criteria – coverage, accuracy, authority, objectivity, and currency. The study indicated that students usually employ only one or two criteria and use them repeatedly to evaluate all five web sites. They evaluated web sites superficially, even with the criteria spelled out for them.

The study by Currie et al. (2010) asked undergraduates how they determine whether a source was scholarly. A variety of statements were expressed in response to this question. The authors reported that two students actually stated that they were looking for peer-reviewed articles. Four students noted the existence and value of references and cited sources. Several students commented on the prestige of the journal that published the article, and four students believed that searching in a scholarly database leads to scholarly literature. Similarly, Pickard, Shenton, and Johnson, (2014) studied how 149 youngsters evaluate information on the World Wide Web, and found that participants felt that information on the Web should be current, topical, free from spelling and grammatical errors and easily verifiable elsewhere but reported that authorship was much less of a priority to them. Heidi

and Barker (2009) in their research into how high school students evaluate information sources found that most of the students viewed trustworthiness of information based on the website design rather than the content of the information. They cautioned that evaluating the website design alone is a risky practice and that students need to be better equipped to evaluate web content.

Studies have also argued that students' difficulty in evaluating sources stems from their lack of knowledge of different genres of information, and the differences between traditional print and online sources (Sidler, 2002; Jenson, 2004; & Purdy 2010).Sidler(2002) points out that the web has added many new genres of information, which means that today's "successful researchers must understand that various types of documents can be found online, including reproduction of print texts as well as multiple 'web page' genres."However, Brarranoik (2001) in her study of biology high school students found that over 80% of the students were more particular and concerned with the content of information and, therefore, recommended that librarians should rather give prominence to the process of information searching by equipping the students with the necessary skills and capabilities to search and evaluate information and information sources.

Evaluation of information on website for credible and reliable information

In today's society, we are faced with an ever-increasing array of information. Being able to deal with that information is a key life skill. Often, the amount of readily accessible information available online has both advantages and disadvantages. The obvious advantage is that we now have easy access to information that would have been quite time consuming and difficult to track down just a few years ago. Unfortunately, there are also a few downsides. One great thing about the Internet is that there are almost no "gatekeepers" who determine what can be posted. However, this also means that there is no quality control. Almost anyone can post information about almost any topic to the net. In most traditional media, evaluating the quality and correctness of information was the job of editors and publishers. Today, with respect to much of the information on the Internet, that responsibility shifts to the information user (students). Faix (2014) noted that, while identifying correctly what a source is, may seem like a small part of the research process, is an important first step that students must take before they can move on to effectively evaluate, use and cite sources. De Rosa, Gauder, Cellentani, Dalrymple, and Olszewski (2011) reported on an OCLC survey produced in 2005 which findings revealed that 72 per cent of college students indicated that "the search engine would

be their first choice the next time they need a source of information." Similarly, the study by Kean, Walker, Kerr-Campbell, and Mckoy-Johnson (2016) asked respondents about the overall quality of information found by using the resources such as Google, Wikipedia, catalogue, databases, Google scholar, ask friends/family, ask instructor, and ask a librarian. The study revealed that 33 per cent of the respondents indicated very high for the overall quality of Google, 22 per cent for Google scholar, 14 per cent for the library databases, 13 per cent for the catalogue and only 2 per cent for 'ask librarian'. The students rated the overall quality of information as high as follows: 37 and 33 per cent for Google and Google scholar, respectively; 30 per cent for 'ask my instructor' and 24 per cent for both the catalogue and the library databases. Boger, Dybvik, Eng, and Norheim(2016) in their comparative study of first and third year nursing students found that most first year students used Google as their choice of search system on the Internet. The authors attributed this choice to the ease and convenience of search engines as students are already familiar with search engine techniques.

Methodology

The study adopted descriptive survey method. A questionnaire was designed to collect data from the undergraduates in seven universities offering Library and Information Science in the South-East and South-South regions, Nigeria. The study used a multi-staged sampling technique. First, the researchers used purposive sampling technique to select seven universities offering Library and Information Science in the South-East and South-South regions, Nigeria. The reason for selecting these universities is based on the fact that they have been offering Library and Information Science (LIS) for long, as opposed to other universities which have just started offering the course.

The copies of the **q**uestionnaire were distributed to the students in their respective classrooms in the department of Library and Information Science100 - 400 level using convenience sampling technique and in some cases research assistants were trained and employed to distribute and collect the questionnaire. Data collection started December 2018 and ended February 2019. In total, 1,062 copies were distributed and 806 completed copies of the questionnaire were returned with return rate of 75.9%these were used for the analysis. The analysis was done using simple percentage and results presented in tables and charts.

Results

Table 1: Names of universities that responded with no of respondents

s/n	**Name of university**	**State**	**No of respondents**	**%**
1	Delta State University, Abraka. (Delsu)	Delta State	120	14.9%
2	Ambrose Alli University, Ekpoma. (AAU)	Edo State	97	12.0%
3	Imo State University, Owerri. (IMSU)	Imo State	109	13.5%
4	Amadu Bello University, Zaria. (ABU)	Kaduna State	110	13.7%
5	Enugu State University of Science and Technology, Agbani (ESUT).	Enugu State	95	11.8%
6.	Nnamdi Azikiwe University, Awka (UNIZIK)	Anambra State	140	17.4%
7	University of Nigeria, Nsukka (UNN).	Enugu State.	135	16.7%
	Total		**806**	

Table 1 showing 7 universities offering library and information science in the South-East and South-South that responded with the number of respondents (See details in Table 1).

Table 2: Gender

Gender	**No of respondents**	**Percentage**
Male	325	40.3 %
Female	481	59.7 %
Total	**806**	**100**

From Table 2, the analysis shows that more than half (481: 59.7%) of the respondents were females, while 325 (40.3%) were males.

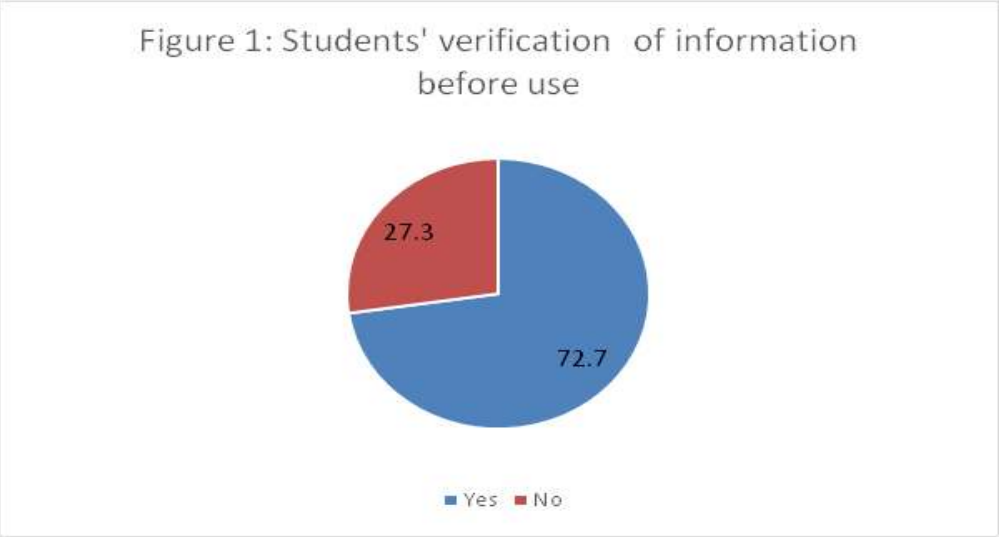
Table 3: Level of study

Level	**No of respondents**	**Percentage**
100	202	25.1%
200	301	37.3%
300	176	21.8%
400	127	15.8%
Total	**806**	**100**

The study covered undergraduates from 100 to 400 levels, results in Table 3 shows 200 level students with the highest number (301: 37.3%) of respondents, followed by 100 level students with 202 (25.1%) respondents.

R.Q.1.

Figure 1: Students' verification of the quality of information they find before use.



Respondents were asked whether they verify the **quality** of the information they retrieve before use. **Quality information** was explained in the questionnaire as "to prove that the information is genuine, real or true". An overwhelming majority (586: 72.7%) answered yes. While, 220(27.3%) of the respondents answered no, to show that they never bothered to verify the information they retrieve before use (Figure 1).

Table 4: A cross -tabulation of name o f university with students' verification of the quality of information.

Name of University	Yes	%	No	%	Total
Delsu	90	15.4%	30	13.6%	120
AAU	71	12.1%	26	11.8%	97
IMSU	65	11.1%	44	20.0%	109
ABU	107	18.3%	3	1.4%	110
ESUT	40	6.8%	55	25.0%	95
UniZik	112	19.1%	28	12.7%	140
UNN	101	17.2%	34	15.5%	135
Total	**586**	**100%**	**220**	**100%**	**806**

The cross-tabulation of name of university with students' verification of the quality of information before use revealed that students in UniZik (19.1%), ABU (18.3%) and UNN (17.2%) verify the authenticity of the information more than students in other universities (see details in Table 4).

Table 5: Cross-tabulation of gender with students' verification of the quality of information

Gender	Yes	%	No	%	Total
Male	301	92.6%	24	7.4%	325
Female	285	59.3%	196	40.7%	481
Total	**586**		**220**		**806**

The cross-tabulation of gender with students' verification of the quality of information revealed that majority of males (301: 92.6%) than the females (285: 59.3%) verify the quality of information before use (see details in Table 5).

Table 6: Cross-tabulation of level of study with students' verification of the quality of information

Level	Yes	%	No	%	Total
100	104	51.5%	98	48.5%	202
200	221	73.4%	80	26.6%	301
300	140	79.5%	36	20.5%	176
400	121	95.3%	06	4.7%	127
Total	**586**		**220**		**806**

The cross-tabulation of level of study with students' verification of the quality of information revealed that almost all (121: 95.3%) the 400 level students indicted as the highest number of students who verify the quality of information followed by 300 level students (see details in Table 6).

R.Q. 2.

Table 7: How students determine good information resources.

s/n	Items	Very important	Important	A little important	Not at all important	Total
1	Check the author name/Qualification	307 (38.1%)	215 (26.7%)	190 (23.6%)	94 (11.6%)	806
2	Verify the publisher	155 (19.2%)	10 (1.2%)	411 (51%)	230 (28.5%)	806
3	Currency of the source	239 (29.7%)	390 (48.4%)	102 (12.6%)	75 (9.3%)	806
4	Author's affiliation	107 (13.3%)	165 (20.5%)	401 (49.8%)	133 (16.5%)	806
5	Relevance of the content	431 (53.5%)	317 (39.3%)	58 (7.2%)	- (0)	806
6	Objectivity	207 (25.7%)	202 (25.1%)	224 (27.8%)	173 (21.4%)	806
7	Audience for which work is produced	288 (35.7%)	321 (39.8%)	100 (12.5%)	97 (12.0%)	806
8	Cited references	101 (12.5%)	250 (31.0%)	365 (45.3%)	90 (11.2%)	806
9	Scholarly/professional	330 (40.9%)	295 (36.6%)	136 (16.9%)	45 (5.6%)	806
10	Overall quality	344 (42.7%)	205 (25.4%)	69 (8.6%)	188 (23.3%)	806

Respondents were asked the level of importance when determining good information resources. Results in Table 7 shows that item such as 'Check the author name/Qualification' was rated by a majority (522: 64.8%) of the respondents as very important and important. The majority (641: 79.5%) of the respondents rated 'verifying the publisher 'as a little important and not at all important. Currency of the source was rated by a majority (629: 78.1%) as very important and important when evaluating information sources. Author's affiliation was rated by more than half (534: 66.3%) of the respondents as a little important and not at all important when evaluating good sources of information. An overwhelming majority (748: 92.8%) of the respondents rated 'relevance of the content' as very important and important when evaluating good sources of information. Opinion is divided among the respondents on considering 'objectivity' of the work when evaluating good sources of information as more than half (409: 50.8%) rated it to be very important

and important, while almost half (397 49.2%) of the respondents rated it as a little important and not at all important. The majority of the respondents (609: 75.5%) rated 'audience' as very important and important. More than half (455: 56.5%) of the respondents rated 'cited references' as a little important and not at all important when evaluating good sources of information. The majority (625: 77.5%) of the respondents rated 'scholarly/professional' as very important and important. More than half (549: 68.1%) of the respondents rated 'overall quality' as very important and important when evaluating good sources of information.

R.Q.3.

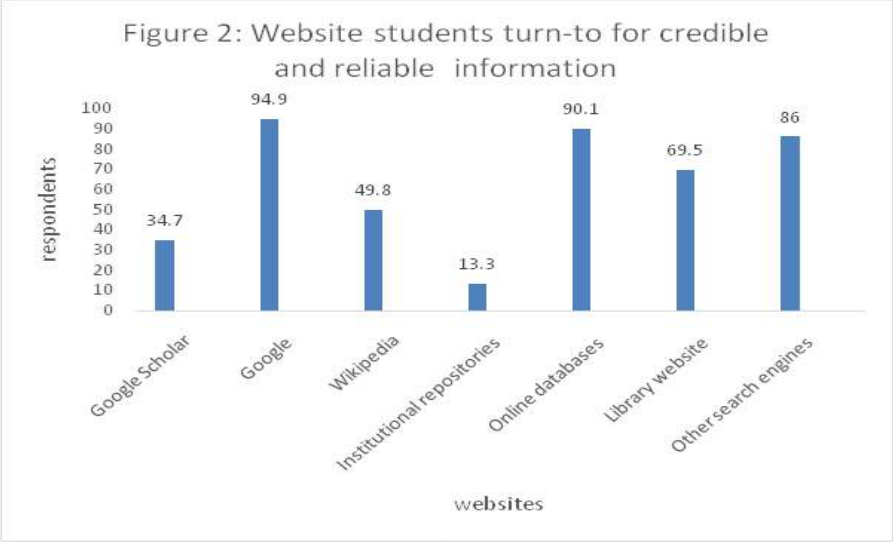
Table 8: How students evaluate information in a website

s/n	Items	Very important	Important	A little important	Not at all important	Total
1	The author is well known.	334 (41.4%)	298 (37%)	102 (12.7%)	72 (8.9%)	806
2	The information is detailed rather than brief.	90 (11.2%)	221 (27.5%)	305 (37.8%)	189 (23.5%)	806
3	The page is new or has been recently updated.	299 (37.1%)	350 (43.4%)	101 (12.6%)	56 (6.9%)	806
4	The page refers to the works of other experts.	301 (37.3%)	270 (33.5%)	165 (20.5%)	70 (8.7%)	806
5	The writing seems to be free from spelling and grammatical errors.	269 (33.4%)	402 (49.9%)	96 (11.9%)	39 (4.8%)	806
6	It is easy to check in other places that the information on the page is correct.	40 (5.0%)	109 (13.5%)	380 (47.1%)	277 (34.4%)	806
7	The information given is clearly topical.	411 (51%)	217 (26.9%)	99 (12.3%)	79 (9.8%)	806
8	The page is provided by a reputable organization.	342 (42.4%)	309 (38.4%)	120 (14.9%)	35 (4.3%)	806
9	The website provides an opportunity to find out more about the author.	307 (38.1%)	288 (35.7%)	129 (16.0%)	82 (10.2%)	806
10	The website is popular.	401 (49.7%)	309 (38.3%)	77 (9.6%)	19 (2.4%)	806

Respondents were asked how they evaluate information found in a website. Results in Table 8 shows that the majority (632: 78.4%) of the respondents rated 'the author is well known' as very important and important when evaluating information on a website. More than half (494: 61.3%) of the respondents rated 'the information is detailed rather than brief' a little important and not at all important when evaluating information on a website. The majority (649: 80.5%) of the respondents rated 'the page is new or has been recently updated' as very important and important. The page refers to the works of other experts was rated by a majority (571: 70.8%) as very important and important when evaluating information in a website. The majority (671: 83.3%) of the respondents also rated 'the writing seems to be free from spelling and grammatical errors' as very important and important when evaluating information in a website. It is easy to check in other places that the information in the page is correct was rated by a majority (657: 81.5%) as a little important and not at all important when evaluating information in a website. The majority (628:77.9%) of the respondents rated the information given is clearly topical or current as very important and important. The page is provided by a reputable organization was rated very important and important by a majority (651: 80.8%) of the respondents. The majority (595: 73.8%)of the respondents rated the website provides an opportunity to find out more about the author as very important and important when evaluating information in a website. The majority (710: 88.0%) of the respondents also rated the website is popular as very important and important when evaluating information in a website.

R.Q.4.

Figure 2: Websites students' turn–to first for credible and reliable information



Respondents were asked to indicate the website they turn-to first for credible and reliable information when confronted with information need. The majority (765: 94.9%) of the respondents indicated Google, followed by 726 (90.1%) respondents indicating online databases, 693 (86%)indicating other search engines, and 560 (69.5%) indicating library websites as the most visited websites. Websites such as Wikipedia (401: 49.8%), Google scholar (280: 34.7%), and institutional repositories (107: 13.3%) were indicated to be the least visited websites. (Figure 2).In the others please specify option, some of the respondents mentioned visiting EbscoHost, NUC (National Universities Commission) virtual library, yahoo, library catalogue, library Facebook.

Discussion of findings

Students' verification of the quality of information they find before use.

The study found that majority of the undergraduates in LIS verifies the information they retrieve before using it. This finding agrees with the findings of Nielsen and Borlund (2011) who discovered that their Danish high school students did take a critical approach to information, using other sources to verify the information they found.

The cross-tabulation of university with students' verification of the quality of information before use revealed that respondents in UNIZIK, ABU and UNN universities verify the quality of the information more than other universities. These three universities have reviewed their LIS curricula and have integrated the information literacy course as a stand-alone course in their LIS programme. This might be the reason why the undergraduate students in these universities are equipped with the skills to verify information before use.

The cross-tabulation of gender with students' verification of the quality of information revealed that majority of males than the females verify the quality of information before use. The finding on students verifying the quality of information resources before use is in agreement with findings from previous studies by Kean, et al. (2016), Shenton and Johnson (2014), and Currie, et. al. (2010).

A cross-tabulation of level of study with students' verification of the quality of information revealed that the 400 level students as indicted are the highest number of students that verify the quality of information followed by 300 level students. The study revealed that 100 level students are the least in verifying the quality of information before use. This might be as a result of difficulties fresh students face in terms of being ill-equipped with information literacy skills needed to evaluate

information and information resources. For students to use qualitative information, the information retrieved should be verifiable based on facts that can be authenticated by another credible source or several credible sources before use. One important element is to determine if the information is accurate and of good quality.

How students determine good sources of information

The study found that more than half of the undergraduates check for 'the authors' name and qualification' before using it. This finding confirms the findings of Yeboah, Dadzie, and Owusu-Ansah (2017) who found in their study that the majority of the students in two "first-class" senior high schools in the Kumasi Metropolis of the Ashanti Region of Ghana check the sources of the information they used. After determining the kind of resource you want to use, the next step in evaluating your information is to determine the authority of its author. Evaluating the authority means to look critically at the author of the information as well as the sponsor or owner of the specific resource. Your goal is to determine if those who wrote the information are qualified to do so and whether they are providing credible information. In many information sources, the author's name is displayed prominently on the front and title page of a book, on the first page of journal articles, and as a byline of newspaper and magazine articles.

It is evident from the analysis that the majority of the undergraduates do not verify the publisher before using the information. This finding re-enforced earlier finding by Burton and Chadwick (2000) in the literature that students in their study do not show concern about the publisher. Checking the reputation of the publisher is important because one component of authority is the publisher of the resource. The publisher is responsible for the actual publication in which the information is located. Resources can be published by a university press, a trade press, a governmental agency, a non-for-profit organization, a specialized press, or an individual (Burton & Chadwick, 2000).Academic print products often are published by university presses, which tend to be scholarly and highly reputable. These publishers put their materials through a formal and rigorous screening to ensure that they meet the standards and goals of the publishing organization. The content often undergoes a peer review process, which gives it high credibility. Trade presses publish trade journals and magazines, which tend to be less formal in their review of information and typically do not require a peer review of their content (Borlund, 2011).

From the analysis, information currency was rated as very important by majority of the undergraduates. Currency refers to the timeliness of the information. On a print product, currency is determined by the date of publication. An information literate

student also understands how current the information has to be for specific purpose. For some needs, the information must be as up-to-date as possible. For other purposes, such as historical research, currency is not important. Additional clues can be found within the information. Look carefully at the references the author used. A journal article that has been published recently but uses references from ten years ago is not likely to be as current as one that uses more recent references.

With regard to author's affiliation, more than half of the undergraduates rated it as a little important and not at all important when evaluating good information resources. The analysis revealed that the majority of the undergraduates rated 'relevance of the content' as very important when evaluating good information resources. This finding supports earlier findings by Brarranoik (2001) that over 80% of high school students were more particular and concerned with the content of information. When evaluating content, you will have to determine whether information is fact or opinion. Facts are things that can be proven to have happened or to exist. Opinions are statements or judgments or beliefs, which may or may not be true (Belanger, Slyke, &Crossler, 2019). Facts should be backed up by a credible source to find the same information. An information source should be critiqued to see if there is any prejudice or bias in the way it is presented. For example, an author may provide accurate facts about the benefits of taking a specific medication for a disease but leave out the serious side effect of taking the medication. Content should be evaluated based on whether the author conveys personal emotions or prejudices makes unjustified claims or excessive claims of certainty, or distorts facts to support a point of view.

Opinion is divided among the undergraduate students on 'objectivity of the work' when evaluating good information resources. In regard to audience, the study revealed that majority of the undergraduate students rated 'audience' as very important and important when evaluating good information resources. It is important to consider the intended audience for whom the information was written. In general, information is sometimes written for specialized groups, practitioners, a general audience or the general public, an educated audience. The intended audience of the information and the information source dictate the type, depth, and focus of the content. In general, you should ask if the content is sufficiently scholarly to meet your goal but not so technical that it is too difficult to understand.

The study found that more than half of the undergraduate students rated 'cited references' as of little importance and not at all important when evaluating good

information resources. However, it is important to consider the listed references to ensure that they support what has been stated. With regard to scholarly articles, the study revealed that majority of the undergraduate students rated being 'scholarly/professional' as very important and important. This is not surprising because the undergraduate students will want to look for credible information from scholarly resources that will meet their information needs. This finding corroborates the findings of Currie et al. (2010) who in a work asked their undergraduate students at the University of Kansas, United States of America "How did you determine whether a source was scholarly" and found that two students actually stated that they were looking for peer-reviewed articles. Four students noted the existence and value of references and cited sources. Journals, not magazines or newspapers, were viewed as more scholarly by four students in that study.

Further analysis of the data revealed that more than half of the undergraduates rated 'overall quality' as very important and important when evaluating good sources of information. The overall quality of information need to be evaluated, that is assessing the structure of the document and how the information is arranged. High-quality information is arranged in a logical and consistent manner. The information is broken down into logical sections or parts and is well laid out.

The factors LIS students consider when evaluating information.

On how the undergraduates evaluate information found in a website, it was found that the majority of the students rated 'the author is well known' as very important and important when evaluating information in a website. Sometimes information found in a website gives clues about the author, publisher, and sponsor or owner. By understanding the clues, you can more readily make an informed decision about the quality of the information and the site itself.

From the results the majority of the respondents rated 'the page is new or has been recently updated' as very important and important when evaluating information in a website. With regard to currency of websites, the date of the last revision is often found on the bottom of the first page or on every page. A reputable website typically gives the last date the site was updated. In some cases, each page has a date, indicating the currency of the information. For example, if an organization's website has a page for the Board of Directors and the page has a current date, you can assume with some certainty that the information is current. Although not true in every case, a current date usually is an indication of currency, but be aware that a site could indicate an update and still contain outdated information.

Another finding revealed that the majority of the undergraduates rated 'the page refers to the works of other experts' as very important and important when evaluating information in a website. In a web page, undergraduates need to check the links to see if they go to where they say they will go and if the linked source is also credible. The study revealed that the majority of the respondents also rated 'the writing seems to be free from spelling and grammatical errors' as very important and important when evaluating information in a website. This finding agrees with the findings of Pickard, Shenton and Johnson, (2014) who in their study found that participants felt that information in the web should be free from spelling and grammatical errors.

The majority of the respondents rated 'the information given is clearly topical' as very important and important. Websites are created for specific purpose. For example, some websites sell products or services. Others convey information on a narrow topic area. Others attempt to persuade readers to a specific viewpoint or opinion. Still other sites are intended for entertainment. Some web pages are even created to cause damage to another individual or group. With this in mind, you can gain a great deal of information on topic of discussion whether it is related to what you are looking for to meet your information need.

The study also showed that the page is provided by a reputable organization, and the website provides an opportunity to find out more about the author were rated as very important and important by majority of the students in this study. Evaluating the person or organization that created and maintains the website is important in knowing the credibility of the information. You must think critically about the purpose of the site. In some cases, especially on reputable websites, information about the author is easily found on the website itself. Look for “Contact Us,” “About,” “Background,” “Who Am I” on the site. Most websites give names, addresses, phone numbers, or e-mails inviting you to contact the site's owner or administrator. The goal is to find someone who is responsible for the site in terms of the information and its accuracy.

It also emerged that the majority of the respondents rated 'the website is popular' as very important and important when evaluating information in a website. Undergraduates will probably want to use websites that their fellow students are frequently using leading to rating popularity of the website as important. From the

results, only items such as 'the information is detailed rather than brief' and 'it is easy to check in other places that the information on the page is correct' were rated to be of little importance and not at all important when evaluating information in a website. This shows that the students do not care about detailed information and checking the information in other sources for accuracy. This might be due to time factor, as many of the students will not want to waste time confirming the page information in another source. This finding agrees with the findings of Rowland et al., (2008) which indicate that students do not want to waste time verifying information found on websites. Similarly, Heidi and Barker (2009) in their study also found that most students viewed trustworthiness of information based on the website design rather than on the content of the information. This clearly shows the difficulty students face in authenticating Internet sources. This may be why Johnson and Lamb (2003) suggested that it is imperative for students to learn how to evaluate the quality of information they find on the web and any other information available elsewhere.

Information sources students' turn-to first for credible and reliable information.

Regarding the website students first turn to for information to complete their research or assignments, it emerged that Google is the search engine students first turn to for information, followed by online databases, other search engines, and library website. The finding on turning to Google first for information support earlier findings by Kean et al. (2016) that Google was the resource most likely to be used by the undergraduates at the University of the West Indies, *Jamaica* to start their research. From the present study, it shows that students rarely turn to library resources for information. This finding re-echoed earlier finding by Grimes and Boening (2001) who found that students used unauthenticated websites and none of them took advantage of the library's resources when left to their own devices, that the students evaluated websites superficially.

The study also found that Wikipedia, Google scholar, and institutional repositories were indicated to be the least visited websites. This might be due to unfamiliarity with these websites. It probably should be expected that students would turn to the information resources with which they are most accustomed, especially to begin their research. There is certainly more work to be done, especially in helping our students to understand the variation in the quality of the information from the different sources and why this is so. The study by Kean et al (2016) reported that only 38 per cent of the respondents indicated that the quality of the information

from the library's databases was high and very high. Similarly, Colon-Aguirre and Fleming-Mary (2012) in their study on undergraduates' use of library resources and Wikipedia found that most respondents recognized that the information sources found in the library are superior to freely available online information and tend to describe them as "reliable" and "credible" sources. In the others please specify option, the respondents mentioned visiting sites such as EbscoHost, NUC virtual library, yahoo, library catalogue, library Facebook for information.

Conclusion

From the analysis, the study found that undergraduate students in LIS verify the information they retrieve by checking the authors' name and qualification before using it. The students of LIS rated currency of the work, relevance of the content, scholarly/professional and overall quality of the information as important when evaluating information. It is imperative students evaluate the information they find from the different sources for credible and reliable information. Besides evaluating the authority of the author, and the currency, you will have to evaluate various aspects of the content itself. When looking critically at the content, you should evaluate for whom the material was written, purpose and scope of the information, objectivity of the information, and its accuracy and verifiability. Information literacy is one of the major solutions to the information explosion, as it enables individuals to cope with this situation by providing them with skills to know when information is needed, where it can be located, how to evaluate it and use it effectively and efficiently.

Presently, the evaluation of information and information resources has come to be regarded as a mainstream skill that should be promoted by teachers in the classroom, as well as by librarians in the context of IL instruction. With regard to how students evaluate information in a website, majority of the undergraduate students rated 'the author is well known', 'page is new or has been recently updated', 'page refers to the works of other experts', 'the writing seems to be free from spelling and grammatical errors', 'the information given is clearly topical', 'the page is provided by a reputable organization', 'the website provides an opportunity to find out more about the author', and 'the website is popular' as very important when evaluating information in a website.

The study also found that students first turn to Google, followed by online databases, other search engines, and library website for information to complete their research or assignments. Websites such as Wikipedia, Google scholar, and institutional repositories were indicated to be the least visited websites.

Discovering the search process of undergraduate students will help to determine what might be needed to improve instructional practices in other countries. Librarians need not discourage the use of search engines and different websites but they must educate teachers and students on quality websites and how to evaluate them independently.

Acknowledgement

The authors acknowledge the support of the Tertiary Education Trust Fund (TETFund), Abuja, Nigeria, through the Isaac Boro College of Education, Sagbama, Baylesa State.

References

Association of College and Research Libraries (ACRL)(2005). *Information Literacy Competency Standards for Higher Education*.American Library Association. Retrieved from: http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/standards.pdf

Barranoik, L. (2001). Research Success with Senior High School Students school librarians Worldwide" *Introduction*- (3rd ed.) Eaglewood, Colorado: Libraries Unlimited,226-227.

Belanger, F., Slyke, C.V., & Crossler, R. E. (2019). *Information Systems for Business: An Experimental Approach*. Burlington: Prospect Press.

Boger, T. S., Dybvik, H., Eng, A. L., &Norheim, E. H. (2016). An assessment of library instruction: its influence on search behaviour of first-and third-year students. *Journal of Information Literacy,10(*2), 23-34.

Brown, G. (2001). Locating categories and sources of information: how skilled are NewSealand Children? *School Library Media Research, 7 (1), 20-34.*

Bundy, A. (2004).*Australian and New Sealand IL Framework: Principles, Standards, and Practice*, 2nd ed., Australian and New Sealand Institute for IL(ANSIIL), Adelaide.

Burton, V.T. & Chadwick, S.A. (2000). Investigating the practices of student researchers: patterns of criteria for use of internet and library sources, *Computers and Compositions*, 17(3), 309-28.

Chang, Y., Shang, X., Mokhtar, I. A., Foo, S., Majid, S., Luyt, B., &Theng, Y. (2012). Assessing students' information literacy skills in two secondary schools in Singapore. *Journal of Information Literacy*, *6* (2), 19–34.

Colon-Aguirre, M. & Fleming-May, R.A. (2012). You just type in what you are looking for: undergraduates' use of library resources vs wikipedia, *The*

Journal of Academic Librarianship. 38(6), 391-399.

Currie, L., Devlin, F., Emde, J. & Graves, K. (2010). Undergraduate search strategies and evaluation criteria. *New Library World*, 111 (3/4), 113 – 124.

De Rosa, C., Gauder, B., Cellentani, D., Dalrymple, T. &Olszewski, L.J. (2011). Perceptions of libraries, 2010: context and community, *A Report to the OCLC Membership, OCLC, Dublin OH*.

Eisenberg, M. B., Lowe, C.A. & Spitzer, K. L. (2004).*Information Literacy: Essential Skills for the Information Age*. 2nd ed. Westport, CT: Libraries Unlimited.

Faix, A. (2014). Assisting students to identify sources: an investigation. *Library Review*, 63 (8/9), 624 – 636

Grimes, D.J. & Boening, C.H. (2001). Worries with the web: a look at student use of web resources, *College and Research Libraries*, 62 (1), 11-23.

Head, A.J. &Eisenberg, M.B. (2009). Finding context: what today's college students say aboutconducting research in the digital age, *Project Information Literacy Progress Report, The Information School, University of Washington*, Retrieved from: http://projectinfolit.org/pdfs/PIL_ProgressReport_2_2009.pdf

Heidi, J., & Barker, S. (2009). How high-school students find and evaluate scientific information: A basis for IL skills development. *Australian Academic and Research libraries, 31*(1), 12–17.

Heinstrom, J. (2006). Fast surfing for availability or deep diving into quality: Motivation and information seeking among middle and high school students. *Information Research*,11 (4), 14-23.

Hung, T. (2004). Undergraduate students' evaluation criteria when using web resources for class papers. *Journal of Educational Media and Library Sciences*, 42 (1), 1-12.

Jenson, J.D. (2004). It's the information age, so where's the information? *College Teaching*, 52 (3), 107-112.

Johnson, L., &Lamb, A. (2003). Evaluating Internet Resources. Retrieved from: http://eduscape.com/tap/topic32.html.

Kattenbeck, M. &Elsweiler, D. (2019). Understanding credibility judgments for web search snippets, *Aslib Journal of Information Management*,71 (3), 956-973.

Kean, C., Walker, G., Kerr-Campbell, M., &Mckoy-Johnson, F. (2016). Students' choice and evaluation of information sources at the University of the West Indies, Mona Campus, *New Library World*, 117 (3/4), 279 – 288.

Keene, J, Colvin, J. & Sissons, J. (2010). Mapping student information literacy activity against Bloom's taxonomy of cognitive skills. *Journal of*

*Information Literacy,*4 (1), 6–20.

Mutula, S.M., Wamukoya, J. & Zulu, S. (2004).*Report of DLIS Sub-committee on Extent of Information Literacy Integration Within the Library and Information Studies Academic Programs, DLIS*. University of Botswana, Gaborone.

Ngo, H. T., Pickard, A. J. &Walton, G. (2019). Information literacy capabilities of upper secondary students: the case of Vietnam. *Global Knowledge, Memory and Communication*, 68(6/7), 453-470.

Nielsen, B.G. & Borlund, P. (2011). Information literacy, learning, and the public library: A study of Danish high school students. *Journal of Librarianship and Information Science*, 43 (2), 106–119.

Pickard, A.J., Shenton, A.K. & Johnson, A. (2014). Young people and the evaluation of information on the World Wide Web: Principles, practice and beliefs" *Journal of Librarianship and Information Science*, 46(1), 3–20.

Purdy, J.P. (2010). The changing space of research: Web 2.0 and the integration of research and writing environments, *Computers & Composition*, 27(1), 48-58.

Rowlands, I., Nicholas, D., Williams, P., Huntington, P., Fieldhouse, M., Gunter, B., Withey, R., Jamali, H.R., Dobrowolski, T. &Tenopir, C. (2008). The Google generation: the information behaviour of the researcher of the future", *Aslib Proceedings*,60 (4), 290-310.

Sidler, M. (2002). Web research and genres in online databases: when the glossy page disappears, *Computers & Composition*, 19 (1), 57-70.

Taylor, T. (2007). *100% Information Literacy Success*. New York: Delmar, Cengage Learning.

Twait, M. (2005). Undergraduate students' source selection criteria: a qualitative study, *The Journal of Academic Librarianship*, 31 (6), 567-73.

Williams, P. & Rowlands, I. (2007).*Information Behaviour of the Researcher of the Future: The Literature on Young People and Their Information Behaviour*. British Library/JISC. Retrieved from: http://www.jisc.ac.uk/media/documents/programmes/reppres/ggworkpackageii.pdf

Yan, Y., Sha, D., Yan, A., & Shang, Q. (2015). Exploring the effect of individual differences on self-efficacy in getting information. *Information Development*, 13 (2), 109-231.

Yeboah, P., Dadzie, P. S. & Owusu-Ansah, C. M.(2017). Information access and evaluation skills of secondary school students in Ghana. *Library Philosophy and Practice (e-journal)*. 1552. Retrieved from: http://digitalcommons.unl.edu/libphilprac/1552