ASSESSMENT OF DIGITAL LITERACY SKILLS OF LIBRARY AND INFORMATION SCIENCE STUDENTS AT BAYERO UNIVERSITY KANO, NIGERIA.

By

Mujidat Adeola BELLO
University Library, Fountain University, Osogbo, Nigeria,
bello.mujidat@fuo.edu.ng,
bellomujidatadeola@gmail.com.
https://orcid.org/0000-0002-4862-7924

Abstract

Digital literacy is essential for Library and Information Science (LIS) students to navigate the complex information landscape and deliver effective information services. This study examined the digital literacy skills of LIS students at Bayero University, Kano, Nigeria, focusing on their understanding of Boolean operators, quotation marks, the asterisk, and truncation in search strategies. A simple random sampling method was used to collect data from 217 students. Findings revealed widespread misconceptions and gaps in understanding these core digital search tools. Although many students selected correct responses, a notable number struggled to distinguish between appropriate and inappropriate search symbols. These results highlight the need for stronger digital literacy training within LIS programs. The study recommends incorporating dedicated modules, practical workshops, and improved access to digital tools into the curriculum.

Keywords: Digital literacy, Digital Literacy Skills, LIS Students, Bayero University

Introduction

Shweta and Mallaiah (2017) defined digital literacy as properly using and evaluating digital resources, tools and services. Digital literacy is a prerequisite to effectively using digital technology in all spheres of life. Ala-mutka (2011) defined digital literacy as emergent literacy, which partially overlaps with internet and computer or ICT literacy. American Library Association's Digital Literacy Task Force (2013) also defined DL as the ability to

use ICT to find, evaluate, create and communicate information, requiring cognitive and technical skills. The task force further stated that a digitally literate person possesses various skills and uses diverse technology to search and retrieve information. He/she also interprets search results, judges the quality of information retrieved, understands the relationships among technology, and uses these skills and the technology to communicate and collaborate with others while participating actively in civic society.

Digital literacy is based upon digital competences, the ability to solve various task in the domain of ICT (David-West 2022). Someone with digital literacy can efficiently utilize technology to locate, assess, and integrate information into everyday life. Additionally, they can communicate via various apps, spreadsheets, writing tools, and across digital channels like email. It means to be digitally literate by possessing a wide range of cultural resources and practices that can be utilized with digital tools. It is the capacity to produce and distribute meaning across various media; to effectively create, collaborate, and communicate; and to recognize the appropriate uses and timing for digital tools to facilitate these activities. Digital literacy refers to the abilities, know-how, and comprehension that facilitate critical, inventive, perceptive, and secure behaviors when utilizing digital technologies in various spheres of life. Some people only think of digital literacy as having the practical abilities needed to use a computer or a particular piece of software. The capacity to locate, assess, and communicate information through typing or digital media platforms is known as digital literacy. In order to develop, assess, and distribute information utilizing information and communication technologies, one must possess a combination of cognitive and technical skills. A portion of the focus of digital literacy has shifted to mobile devices due to the internet and social media's usage, which initially concentrated on digital skills and standalone PCs. Digital literacy expands on the fundamental abilities of conventional literacies, not replaces them, in line with other developing definitions of literacy that acknowledge the cultural and historical ways of generating meaning. Digital literacy ought to be viewed as a component of the learning process.

In addition, the foundation of Bayero University, Kano, involved merging two existing institutions to create a comprehensive university that would serve the educational needs of the northern region of Nigeria. The Department of Library and Information Science establishment was part of this broader initiative to expand higher education and support the development of library

and information services in the region. Over the years, the department has continued to adapt and grow to meet the changing demands of the information age.

Objectives of the Study

The study's main objective is to assess the digital literacy skills of Library and Information Science (LIS) students in Bayero University, Kano. Other specific objectives are;

1. To find out the ability of LIS students to identify Boolean operators.
2. To find out the ability of LIS students to identify another way of using Boolean Operators.
3. To find out the ability of LIS students to use quotation marks when searching.
4. To find out the ability of LIS students to use asterisk in searching;
5. To find out the ability of LIS students to use truncation in searching.

Research Questions

This study will provide answers to the following questions;

1. How do LIS students identify Boolean operators?
2. How do LIS students identify another way of using Boolean Operators?
3. How do LIS students use quotation marks when searching?
4. How do LIS students use asterisks when searching?
5. How do LIS students use truncation in searching?

Significance of the Study

The study's findings can inform educational policies, instructional practices, and support initiatives to equip LIS students with the necessary skills to thrive in an increasingly digital information landscape. This may lead to increased fund allocation from the university management. Also, the study findings would help LIS students know the level of their digital literacy skills; this would spur them to improve where they are lagging. Also, it will enable information professionals and academia to be aware of the level of digital literacy skills of undergraduates and strategize on innovative ideas on how to develop, use and improve students' digital literacy skills. Lastly, the study findings would also be of value to future researchers, as they would widen their horizon of knowledge.

Literature Review

Digital Literacy

In defining the digital competence framework, Ferrari (2012) stated that being digitally competent implies that an individual can understand media, search for information, and be critical about what is retrieved. A digitally literate individual should be able to behave ethically and effectively communicate with others using various digital tools and applications. In her opinion, having technical skills at the core of a digital competence model does not give enough importance to other equally relevant aspects. Therefore, digital competence should be understood as a multifaceted concept that focuses primarily on solving problems and building new knowledge through technology and media in a critical, creative, flexible, and ethical manner. Digital means information represented in numeric form and primarily used by a computer. Jones-Kavalier and Flannigan (2008) stated that digital literacy represents a person's ability to perform tasks effectively in a digital environment. Digital literacy includes reading and interpreting media, reproducing data and images through digital manipulation, and evaluating and applying new knowledge gained from digital environments. The capacity to comprehend and apply knowledge in various formats from a broad range of sources when displayed on a computer is known as digital literacy. The capacity of an individual to carry out tasks efficiently in a digital setting is known as literacy. This includes the capacity to read and comprehend media, to replicate information and images through digital modification, and to assess and apply newly acquired knowledge from digital settings. The European Reference Framework defines digital literacy as using information technology critically and confidently for work, play, and communication. It is based on a foundation of fundamental ICT skills, which include using computers to retrieve, evaluate, store, produce, present, and exchange information and to communicate and participate in online collaborative networks (European Communities, 2007).

According to the ALA Digital Literacy Taskforce (2011), digital literacy is the capacity to use information and communication technology for information creation, evaluation, finding, and sharing. It involves both technical and cognitive abilities. It goes on to say that someone who is digitally literate has the range of technical and cognitive skills necessary to locate, comprehend, assess, produce, and communicate digital information in various formats. They can also use various technologies effectively and suitably to retrieve information, evaluate results, and assess the quality of that information.

Shweta and Mallaiah (2017) defined Digital Literacy as properly using and evaluating digital resources and services. In view of this, digital literacy is a prerequisite to effective use of digital technology in all spheres of life. Ala-mutka (2011) defined digital literacy as emergent literacy, which partially overlaps with Internet literacy and computer or ICT literacy. American Library Association's Digital Literacy Task Force (2013) also defined DL as the ability to use ICTs to find, evaluate, create and communicate information, requiring cognitive and technical skills. The task force further stated that a digitally literate person possesses various skills and uses diverse technology to search and retrieve information. He/she also interprets search results, judges the quality of information retrieved, understands the relationships among technology, and uses these skills and the technology to communicate and collaborate with others while participating actively in civic society.

Possessing a wide range of cultural resources and practices at your disposal that you can utilise with digital tools is what it means to be digitally literate. It is the capacity to produce and distribute meaning across various media; to effectively create, collaborate, and communicate; and to recognize the appropriate uses and timing for digital tools to facilitate these activities. Digital literacy refers to the abilities, know-how, and comprehension that facilitate critical, inventive, perceptive, and secure behaviors when utilizing digital technologies in various spheres of life. Some people only think of digital literacy as having the practical abilities needed to use a computer or a particular piece of software.

However, being digitally literate goes beyond simply being able to use or access computers. It is about working together, being secure, and communicating efficiently. It involves being creative and having a sense of and comprehension of culture and society. Understanding when and why digital technologies are helpful for the work at hand, and when they are not, iss the essence of being digitally literate. It involves considering all of the possibilities and difficulties that digital technology provide. Undergraduates with digital literacy are more equipped to navigate the myriad of new and developing opportunities that come with digital technologies while also being aware of the issues they may pose. In short, digital literacy is the 'savviness' that allows students to participate meaningfully and safely as digital technology becomes ever more pervasive in society.

Technological digital literacy is the ability to find, create, study, evaluate, and

use information via various digital platforms by using digital devices (such as smartphones, laptops, and tablets) to access the internet. When all three literacies are combined, the differences are broken out as follows: Information Literacy: The ability to locate, evaluate and use/apply information.

Media Literacy: The ability to access, analyze, evaluate, and create information in various forms.

Digital Literacy: The ability to use digital technology, networks, and communication tools to find, evaluate, and create information. Awari and Krishnamurthy (2017) posited that digital literacy enables individuals to use digital technology in all spheres of life. A study on digital literacy among postgraduate students at the University of Agricultural Sciences was conducted. The study found that most (79.34%) students own smartphones to access the internet. The majority (69.66%) of the respondents make use of the internet daily. While for internet use, 79.34% stated that they use the internet for academic work. However, only 34.78% of the students knew about the web portal. All (100%) of the respondents stated that their preferred search engine was Google. The respondents' awareness about different search strategies was poor, as they knew only about concept search (47.82%) and Boolean search (41.39%). The findings of this study indicate that the students are using digital devices and other applications for personal use or entertainment. However, their ability to use them for learning purposes was minimal.

Digital Literacy Skill

According to Adeleke & Emeahara (2016), the level of digital literacy skills possessed by students will enhance their quest to retrieve information from the Internet or the World Wide Web, online databases, e-books, e-journals, films, e-conversations, e-government reports, digital images or any number of other possible digital sources. This was buttressed by Yo (2021), who opined that the capacity to use e-information on the internet differs from the usual print and the way of reading on the internet is branchy, a student can navigate to the right or left, based on what is needed more at this moment. This suggests that undergraduates must be technologically savvy to utilize the EIRs that the library provides fully.

Although possessing technical skills is an aspect of digital literacy, one cannot ignore the fact that individuals must also possess cognitive and information skills that are pivotal for the Google/Net generation and enable

them to make responsive choices. Therefore, critical thinking, creativity, teamwork, communication, information literacy, media literacy, technological literacy, and flexibility are examples of digital skills. This made it considered as a blend of several literacies required for operating in the digital environment. Addressing digital literacy, Shrestha (2018), concludes that there is inconsistency in understanding the term that has been creating confusion; thus, the term 'DL' should be referred to in its plural form as 'digital literacies, which would benefit in understanding the term. Shopova (2014) investigated the key role of digital literacy and students' skills in using new technology. Findings revealed that the majority of the students have no skills needed to take advantage of the electronic library at the University and do not know how to use its rich information resources. Awari and Krishnamurthy (2017) posited that digital literacy enables individuals to use digital technology in all spheres of life. Baro, Obaro and Aduba (2019) investigated the Digital Literacy skills possessed by library and information professionals working in various libraries in English-speaking African countries. The results showed that the respondents thought they had a moderately low degree of DL proficiency. Regarding database search skills, uploading documents to online platforms, skills in applying new technologies into library services, ability to create different file formats and ability to use open source software, respondents rated their skills very high. However, the skills related to developing a library website and metadata were ranked as low and average, respectively.

Acquiring these skills can enhance problem-solving skills, creativity, productivity, and critical thinking abilities. Such kinds of digital literacy abilities;

- Computer Skills: Many people neglect to learn more about this topic and fail to comprehend how a computer's hardware and software work together and how it processes and delivers information. Still, these factors are crucial in the field of digital education.

- Communication skills: Learning to communicate effectively is essential, and it is the main reason so many people want to use the internet. Setting up an online video conference profile on websites like Skype or creating an email account on services like Gmail will significantly improve your ability to communicate and engage with others.

- Social media skills: Facebook, Twitter, and Instagram are the three leading social media platforms on which one can create an account to

increase one's online presence.

- Personal devices and apps: Purchasing personal devices such as laptops, tablets, smartphones, and/or desktop computers is one of the best ways to enhance skills. The best way to learn new skills and improve current ones is to use devices often and integrate them into daily activities.

- Internet navigation skills: It's essential to be able to use the internet quickly and effectively. Familiarity with search engines like Google Search is an excellent starting point.. Skills are protected by privacy: Many websites require personal information to provide their services. Learning the critical digital competency of determining if a website is safely protecting data and guaranteeing privacy is critical.

- Evaluating the reliability of a source: Avoiding the many websites that offer false information is an important part of using the internet. Information literacy is among the essential digital literacy skills, which focuses on locating, assessing, and effectively using digital information. Media literacy gives one the tools to evaluate and create media messages on various channels; social media literacy helps one understand social media platforms for communication purposes; and cyber security literacy helps one recognise cyber-attacks' hazards.

Yusuf and Endouware (2021) used a questionnaire as a data collection instrument in their assessment of the digital literacy skills of 100 academic librarians in Nigerian Universities. The study revealed a low level of digital literacy skill possession by majority of the respondents. This result increases curiosity about the digital literacy level of undergraduates, as librarians are supposed to be digital literacy advocates for undergraduates in their quest to use EIRs. The study recommended that librarians and students scale up their level of digital literacy skills, which is necessary to function effectively in the information age. Thus, literature has shown that studies have been conducted to assess the level of digital literacy of information professionals in Nigeria (Jibril et al, 2018; Yusuf & Endouware, 2021). Some results indicated that low search skills may hinder the use of EIRs. Other findings indicate that Nigerian universities have not fully entrenched digital literacy due to a lack of digital facilities, a poor network, and low digital skills. Despite these revelations, there is

insufficient empirical literature to ascertain the level of digital literacy skills among undergraduates. Therefore, this study is significant in bridging this gap. Salman et al. (2020) examined the variables influencing 278 undergraduate students' acquisition of digital literacy skills at the Fountain University library in Osogbo. The study adopted a social survey research design and used a questionnaire as the primary data collection instrument. Results showed that 90 (32.4%) admitted that lack of digital skills hinder their use of EIRs. The majority of respondents (161) (57.9%) and 121 (43.5%) identified low internet bandwidth and volatility of online information as significant challenges to their acquisition of digital proficiencies. Because this has the potential to increase students' patronage in the libraries, it was advised that libraries and librarians take proactive steps in training and orienting users on digital skills to stimulate the library's use.

Methodology

This study's population consisted of Library and Information Science students at Bayero University from levels 100 to 400. The study employed a simple random sampling technique to ensure fair representation and reduce selection bias. This method was chosen for its ability to give each student an equal and independent chance of selection, making it suitable for a relatively homogenous population and enhancing the generalisation of the findings. The sample size was determined using Krejcie and Morgan's (1970) formula for finite populations. Based on this standard, a sample of 217 students was selected to achieve a 95% confidence level with a 5% margin of error, striking a balance between statistical reliability and practical feasibility. Ultimately, 217 students were randomly chosen, ensuring proportional representation across all academic levels and maintaining the integrity of the sampling proces

Result and Discussion of Findings

It was gathered that 211 (97.2%) of the 217 questionnaires distributed to library and information science students, Level 100—Level 400, were recovered, while 06(2.8%) of the questionnaires were not returned by the respondents. This means that a total of 211(97.2%) were used for data analysis and interpretation.

Question 1: These are Boolean Operators except

Table 1: Identification of Boolean Operators

These are Boolean Operators except	THE	OR	NOT	AND	Total
Frequency Percentage %	191 (90.5%)	06 (2.8%)	14 (6.6%)	-	211 (100%)

From the above table, it was gathered that 191 (90.5%) of the respondents chose THE as an option that is not Boolean Operators, 06 (2.8%) of the respondents chose OR as an option that is not Boolean Operators, and 14 (6.6%) of the respondents chose NOT as an option that is not Boolean Operators. The tables also indicate that the respondent who chooses THE 191(90.5%) had the highest percentage.

Question 2: Another way of using Boolean Operators is the use of………

Table 2: Alternative Uses of Boolean Operators

Another way of using Boolean Operators is the use of……….	+ and -	÷and ×	: and ;	% and @	Total
Frequency Percentage %	150 (71.1%)	15 (7.1%)	25 (11.8%)	21 (10.0%)	211 100%

Table 2 above showed that 150 (71.1%) of the respondent choose + and - as another way of using Boolean Operators, 15 (7.1%) of the respondent choose ÷ and × as another way of using Boolean Operators, 25 (11.8%) of the respondent choose: and; as another way of using Boolean Operators while 21 (10.0%) of the respondent choose % and @ as another way of using Boolean Operators. The table also indicates that respondents who choose + and - 150 (71.1%) have the highest percentage

Question 3: Using Quotation marks in searching provides….

Table 3: Use of Quotation Marks in Search Queries

Using Quotation marks in searching provides…..	Synonyms terms	Homophones	Adjectives	Exact words	Total
Frequency	76	05	24	106	211
Percentage %	(36.0%)	(2.4%)	(11.4%)	(50.2%)	100%

Result from Table 3 depicts that 76 (36.0%) of the respondent choose using Quotation marks in searching provides Synonyms terms, 05 (2.4%) of the respondent choose using Quotation marks in searching provides Homophones, 24 (11.4%) of the respondent choose using Quotation marks in searching provides Adjectives and 106 (50.2%) of the respondent choose using Quotation marks in searching provides Exact words. The table also indicates that respondents who choose to use quotation marks in searching provide exact words, with 106 (50.2%) having the highest percentage.

Question 4: Using Asterisk in searching provides…

Table 4: Use of Asterisk (*) for Truncation in Search Queries

Using Asterisk in searching provides…	Variants words	Exact words	Homophones	Synonyms	Total
Frequency	138	40	05	28	211
Percentage %	(65.4%)	(18.9%)	(2.4%)	(13.3%)	100%

The above Table 4 revealed that 138 (65.4%) of the respondent choose using asterisk in searching provides Variants words, 40 (18.9) of the respondent

choose using asterisk in searching provides Exact words, 05 (2.4%) of the respondent choose using asterisk in searching provides Homophones and 28 (13.3%) of the respondent choose using asterisk in searching provides Synonyms. The table also indicates that respondents who chose Variant words 138(65.4%) had the highest percentage.

Question 5: Another way of using truncation in searching is the use of.....Table 5: Alternative Truncation Techniques in Search Queries

Another way of using truncation in searching is the use of.....	Quotation marks	Question marks	Exclamation marks	Parentheses	Total
Frequency	102	71	18	20	211
Percentage %	(48.3%)	(33.6%)	(8.5%)	(9.5%)	100%

Result from table 5 showed that 102 (48.3%) of the respondent choose Quotation marks as another way of using truncation in searching, 71 (33.6%) of the respondent choose Question marks as another way of using truncation in searching, 18 (8.5) of the respondent choose using Exclamation marks as another way of using truncation and lastly 20 (9.5%) of the respondent choose using Parentheses as another way of using truncation. . the table also indicate that respondent that Choose Quotation marks 102 (48.3%) has the highest percentage.

Finding of the Study
The findings of the study showed that:
1. The study's findings reveal significant insights into the digital literacy skills of Library and Information Science (LIS) students at Bayero University, Kano, Nigeria. Most respondents (90.5%) incorrectly identified "THE" as an option that is not a Boolean operator. Only 2.8% of the respondents correctly identified "OR" as a non-Boolean operator, while 6.6% identified "NOT" as a non-Boolean operator. These results indicate that many LIS students have a limited understanding of basic Boolean operators, which are essential for effective information search and retrieval.

The data also shows that the respondents who selected "THE" as a non-Boolean operator had the highest percentage (90.5%) compared to the other

options. This suggests that LIS students struggle the most with differentiating the common English word "the" from actual Boolean operators, highlighting a significant gap in their digital literacy skills related to information searching techniques.

1. Furthermore, the data from Table 2 shows that 71.1% of the respondents incorrectly identified "+" and "-" as another way of using Boolean operators. Only 7.1% correctly identified "÷" and "×" as non-Boolean operators, while 11.8% and 10.0% selected ":" and ";" and "%" and "@" respectively as alternative ways of using Boolean operators. These findings suggest that the LIS students have a poor grasp of the correct syntax and symbols associated with Boolean logic, a critical component of digital literacy. The results indicate that the respondents who selected "+" and "-" as another way of using Boolean operators had the highest percentage (71.1%) compared to the other options. This suggests that LIS students struggle the most with differentiating common mathematical symbols from actual Boolean operators, highlighting a significant gap in their digital literacy skills related to information searching techniques.

2. The results from Table 3 indicate that 50.2% of the respondents correctly identified that using quotation marks in searching provides exact words. However, a significant proportion of the respondents incorrectly believed that quotation marks provide synonyms (36.0%), homophones (2.4%), or adjectives (11.4%). These findings suggest that while some LIS students understand the use of quotation marks in information searching, others still struggle with the nuances of this feature.

3. The data from Table 4 reveals that 65.4% of the respondents correctly identified that using an asterisk in searching provides variant words. However, a substantial proportion of the respondents incorrectly believed that the asterisk provides exact words (18.9%), homophones (2.4%), or synonyms (13.3%). These findings indicate that while most LIS students understand the function of the asterisk in information searching, a significant number still have misconceptions about its precise use.

4. The results from Table 5 show that 48.3% of the respondents correctly identified quotation marks as another way of applying truncation in searching. However, a significant proportion of the respondents incorrectly believed that question marks (33.6%), exclamation marks (8.5%), or parentheses (9.5%) can be used for truncation. These findings

suggest that while nearly half of the LIS students recognize using quotation marks for truncation, many still have misconceptions about the appropriate symbols for this function.

Discussion of findings

The data across the five tables highlights that the respondents who selected the correct options had the highest percentages, indicating that a substantial number of LIS students possess a solid understanding of Boolean operators, the use of quotation marks, the function of the asterisk, and the application of truncation in information searching. However, the study also reveals significant gaps in the digital literacy skills of a sizable portion of the LIS student population, particularly in differentiating between appropriate and inappropriate symbols for various search features.

These findings underscore the need for targeted interventions to improve LIS students' digital literacy skills, particularly in Boolean logic and information searching. Enhancing the coverage of these topics in the LIS curriculum, providing hands-on training and workshops, and ensuring access to appropriate digital resources and tools will be crucial in addressing the identified gaps and strengthening the students' preparedness for the digital information landscape.

Conclusion

The findings of this study highlight significant areas of concern regarding the digital literacy skills of Library and Information Science (LIS) students at Bayero University and other library schools in Nigeria. The results indicate that a substantial proportion of the respondents exhibit misconceptions and lack understanding of Boolean operators, quotation marks, the function of the asterisk, and the application of truncation in information searching.

While the respondents who selected the correct options had the highest percentages, the study also revealed that many LIS students still struggle with differentiating appropriate and inappropriate symbols for various search features. This suggests that their digital literacy skills are not yet at the level necessary to navigate the complex information landscape effectively.

The practical implications of these findings are significant, as LIS students are expected to possess strong digital literacy competencies to support their future roles as information professionals. services. effectively.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed:

1. Library and Information Science educators should work towards curriculum enhancement. They should incorporate dedicated modules or courses within the LIS curriculum that focus on developing a deeper understanding of Boolean operators, quotation marks, the asterisk, and truncation in information searching.

2. Library and Information Science educators should ensure that these digital literacy concepts are not treated in isolation but are integrated across various LIS courses, reinforcing their practical applications.

3. Review and update the curriculum regularly to align with the evolving digital information landscape and emerging best practices in information retrieval.

4. Library and Information Science educators must ensure that LIS students have access to a comprehensive suite of digital resources, including online databases, search engines, and information retrieval tools.

By implementing these recommendations, Bayero University Kano can take proactive steps to address the gaps in digital literacy skills among LIS students and better prepare them for the evolving demands of the information profession. Strengthening the digital competencies of LIS students will benefit them and contribute to the advancement of the Library and Information Science field in Nigeria.

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