

RESEARCH ARTICLE

Information Search Strategies among University Students: A Narrative Review of Search Behaviors, Challenges, and Information Literacy

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Abstract

This study aims to examine the information retrieval techniques and search strategies employed by university students in academic contexts. A narrative review approach based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) to ensure a transparent and rigorous review process to evaluate information searching techniques of university students. Relevant literature was retrieved from major academic databases, including IEEE Xplore, ERIC, Google Scholar, covering studies published between 2000 and 2026. Around 50 studies that fits into the inclusion criteria were reviewed and synthesized. The review focused on three major themes: (i) information search strategies employed by university students, (ii) challenges encountered during information-seeking processes, and (iii) strategies for improving students' utilization of web searches for academic research. The findings indicate that students predominantly rely on general search engines such as Google because of their convenience and accessibility, while demonstrating limited use of advanced search techniques, including Boolean operators, phrase searching, and query reformulation. The review identified information overload, inadequate information literacy skills, and difficulties in evaluating source credibility as major barriers to effective information retrieval. This study highlights the critical role of information literacy integrating advanced search training and digital information literacy programs into higher education curricula to enhance students' research competencies and search effectiveness. As the study relies exclusively on secondary data, future research should incorporate primary data to provide more comprehensive insights into university students' information-searching behaviors and self-efficacy.

Keywords

Information search strategy, Information literacy, Online Search techniques, Information overload, Information Retrieval.

Citation

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1. Introduction

Information searching is the process through which information is obtained by identifying, accessing, and utilizing the information from different sources in order to meet a specific need or find an answer to a particular question. In information search, one has to go through a lot of information, whether online or not, to be able to get the right information to serve a particular purpose. Information search is vital in areas such as education, business, research, among others. The first step in information search is having a need for some particular information. (Weber et al., 2018). However, information can be sourced from many different places, including books, periodicals, the internet, databases, government documents, and media. It is important to know where to source your information and the type of sources to use when you are looking for information. Information searching strategies are the different ways in which one can obtain information (Kim et al., 2014). Such approaches are very important in ensuring that people can successfully obtain information that will serve them based on their needs whether academically, professionally, or personally. In addition, information search entails searching and retrieving information where adults prefer quick downloading, text links, and sites that are easy to navigate. Adults do not usually enjoy animations and advertisements on web pages. However, a search strategy refers to the organization of words that are used to search a database with the aim of ensuring that the results obtained are exact by incorporating the different elements of the search question. It is very important to employ different search methods when searching information from library catalogues, internet search engines, and databases.

Study purpose

The primary purpose of this study is to explore, observe, and assess web information retrieval techniques or search strategies experienced by university students. The objectives of this study are as follows:

- I. To identify and categorize the various information searching strategies employed by students in academic contexts.
- II. To investigate the common challenges and obstacles faced by students in their information-seeking processes.
- III. To determine effective strategies for improving students' utilization of web searches for academic research.

Rationale

The study lies in enhancing information search strategies to help users quickly and easily find and retrieve the information they need. By exploring students' information literacy towards information-searching techniques and the resources they frequently use, we can identify effective strategies and common challenges. The study's findings will aid in setting evaluation standards for web-based content and addressing the difficulties students face in finding reliable information online. Additionally, the suggestions from respondents will provide valuable insights into overcoming these challenges and improving students' overall search experience. This study aimed to investigate, examine, and evaluate the methods university students use to retrieve information from the Web or search for content. The many resource categories that university students utilize most frequently will also be evaluated by this study. Additionally, this study will examine the typical difficulties and barriers that students have while

looking for information online and identify methods for enhancing students' use of the Web for research.

2. Literature Review

Information Search Strategies Employed by University Students

The emergence of online information sources has greatly influenced the manner in which information is sought by university students for research purposes. Research carried out in the past suggests that there exist various methods of seeking information, including keyword search, Boolean searching, phrase searching, and query reformulation among others. These methods have been found to be closely related to the digital literacy and searching skills possessed by university students ([Head & Eisenberg, 2009](#)). Students with higher digital competencies tend to adopt more sophisticated search techniques and demonstrate better academic performances.

With all of the sophisticated search capabilities available to researchers, many studies have shown that students tend to use general search engines due to their simplicity. ([Rowlands et al., 2008](#)). Studies have consistently showed that students frequently conduct searches using simple keywords and rarely utilize advanced search operators or specialized academic databases ([Nikolopoulou & Gialamas, 2011](#)). This over-reliance on basic search practices often limits the quality and comprehensiveness of retrieved information. In addition, it is clear from the literature that the search behaviors of students change as they advance within their studies. [Georgas \(2014\)](#) explore adoption of advanced search methods increases as one advance in his studies; this reveals that information literacy skills can be gained through learning. However, the persistent use of trial-and-error searches as well as general search engines still calls for more structured guidance on information search.

Challenges and Obstacles in Students' Information-Seeking Processes

Despite all the improvements in the availability of information through technology, there are still many problems that confront students during the process of searching for information. The most common problem experienced by many is information overload. This happens when one is faced with too much information and fails to find relevant and credible sources. ([Bawden & Robinson, 2009](#)). The rapid growth of online information has increased the complexity of evaluating, filtering, and synthesizing information effectively. Another significant challenge is students' limited information literacy competencies. Numerous studies have reported that students often struggle to formulate effective search queries, evaluate source credibility, and distinguish between scholarly and non-scholarly information ([Yebowaah & Owusu-Ansah, 2020](#)). Many students exhibit a tendency to select the first few search results without critically assessing their authority or relevance, thereby increasing the risk of relying on inaccurate or biased information. Psychological and cognitive barriers also influence students' information-seeking behavior. Factors such as search anxiety, low self-efficacy.

Strategies for Improving Students' Utilization of Web Searches for Academic Research

Information literacy education is highly valued when it comes to helping the students improve their searching skills on the internet. The information literacy education helps students gain the knowledge and the skills that help them develop a good query as well as assess sources of information. Several studies recommend explicit instruction in advanced search techniques, including the use of Boolean operators, controlled vocabulary, query reformulation, and database-specific search functionalities ([Baldwin et al., 2010](#)). Moreover, scaffolded instruction and hands-on learning activities have been found to enhance students' confidence and search performance by gradually developing their information-searching competencies ([Chu & Law, 2007](#)). Researchers have also highlighted the importance of teaching structured evaluation frameworks to assist students in assessing the credibility, relevance, and reliability of online information sources ([Limberg et al., 2008](#)). In addition, recent studies advocate for the integration of digital literacy and information literacy programs into university

curricula to prepare students for the increasingly complex information environment and to promote lifelong learning skills. In general, it is clear from the available literature that even though university students are becoming regular consumers of digital information sources, they lack many aspects of advanced searching abilities and information evaluation skills. This calls for efforts from universities, library staff, and lecturers to design effective information literacy programs in order to improve information searching skills among university students.

Research Gaps

This review was more concerned with search behavior, information literacy and information retrieval problems faced by students including information overload and the lack of the application of complex search strategies. There has been a gap in the literature regarding studies that explore the effect of students' cognitive and emotional experience when reading web sites on their information-seeking abilities and learning outcomes. Most of the studies conducted so far paid attention to the performance aspect of website reading but not the emotional effects of these difficulties.

3. Methodology

This study adopted the methodology of secondary data analysis guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) to ensure a transparent and rigorous review process to evaluate information searching techniques of university students. Relevant peer-reviewed studies published between 2000 and 2026 were identified through structured Boolean search queries across selected scholarly databases. Sources of secondary data were academic journals, books, reports, and previous research works related to the subject area. The main purpose is to conduct analysis of findings, trends, and patterns related to information searching behavior of university students.

Search Strategy

To identify the relevant Literature, the authors developed a Boolean search strategy using the query “(Information Searching OR “Search Behaviors”) AND Strategy AND (Information Literacy OR User Literacy)”. The search was performed across four selected scholarly databases, and the retrieved records were screened according to the PRISMA 2020 framework.

Inclusion / Exclusion Criteria

Table 1. Inclusion/Exclusion Criteria of Studies

Parameter	Inclusion Criteria	Exclusion Criteria
Publication Type	Peer-reviewed journal articles, conference papers, books, and institutional reports	Editorials, blogs, newspapers, opinion pieces, and non-scholarly websites
Population	Studies involving university students	Studies involving school students, professionals, or the general public only
Research Topic	Studies on information-searching behavior, information literacy, search strategies, and web-based information retrieval	Studies unrelated to information searching or higher education
Study Focus	Research examining search techniques, challenges, and information-seeking practices	Studies focusing solely on technical IR systems or algorithms without user perspectives
Language	Publications written in English	Non-English publications

Accessibility	Full-text articles available for review	Abstract-only or inaccessible studies
Time Period	Studies published within the selected review period (e.g., 2000–2026)	Studies published outside the selected timeframe

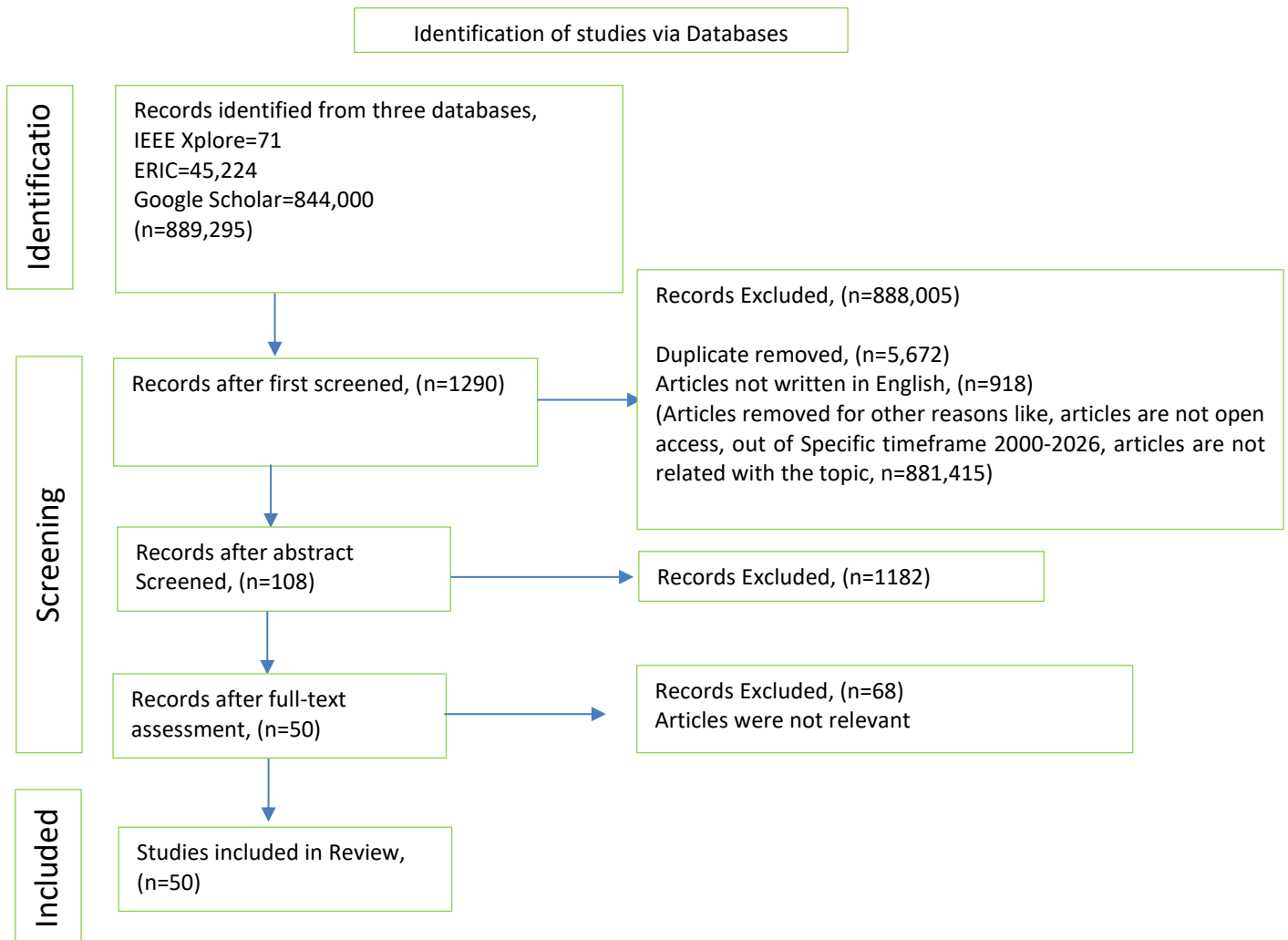


Figure 1. PRISMA 2020 workflow diagram. Source(S): Olatokun and Oladokun (2026)

Study Selection Process

Table 2. Study Selection Process

Stage	Parameter	Description
Identification	Database search	Literature identified from academic databases, journals, books, and institutional reports.
Screening	Title and abstract review	Duplicate and irrelevant studies removed.
Eligibility	Full-text assessment	Remaining studies assessed using inclusion and exclusion criteria.
Inclusion	Final selection	Studies directly related to university students' information-searching strategies and challenges included in the review.

4. Findings

Information Search Strategies used by university students

Study conducted by Ay and Erdem (2020) investigated university students' online information search strategies, highlighting that student utilize a range of techniques, from basic keyword searches to evaluating the credibility of sources. The study found that effective search strategies are closely tied to individual educational factors such as digital literacy, self-regulation, and academic motivation. Students with stronger digital skills and higher motivation are more likely to employ advanced strategies and, consequently, perform better academically. Kahraman (2021) study, the role of Internet self-efficacy in web-based science learning is explored, showing that students who have confidence in their online navigation skills use more effective and strategic information searches. These students are able to navigate complex online environments more efficiently, leading to better learning outcomes. Conversely, students with low self-efficacy tend to struggle with information overload, making it harder to find relevant information and diminishing their learning success.

Often availability of scientific materials possesses serious difficulties for university students. According to this study, students commonly rely on easily accessible sources. Many students show a limited ability to critically evaluate the credibility or bias of the sources they use, underutilize library resources, and find them difficult to traverse. These results highlight the need for more thorough instruction in information literacy to provide students the tools they need to access, assess, and use scientific knowledge. 54.2% of users of this online catalogue performed keyword searches, more than any other type of search, according to his research. But often, their keyword searches turned up nothing. Because they didn't know how the system handled their keywords, most users assumed they needed online help in order to proceed. Habibi (2007) emphasized that key factors for effective information retrieval involve selecting appropriate keywords, identifying related synonyms, understanding the connections between terms, and properly applying Boolean operators. Similarly, Baldwin et al., (2010) conducted a study on how students approach searching for information in academic contexts. They identified different strategies based on students' familiarity with digital tools and their searching objectives. They found novice searchers often used basic keyword searches and selected results from the first few options, while more experienced students employed more sophisticated techniques such as refining search queries, using Boolean operators, and cross-referencing sources. The study highlights the importance of developing students' information literacy skills to improve their ability to search for, evaluate, and use information effectively in academic settings. Head and Eisenberg (2009) investigated how college students seek information in the digital age, revealing that most students rely heavily on search engines, often bypassing more reliable academic databases. The study showed that students prioritize convenience over quality, frequently selecting the first few results they encounter without critically evaluating them. Furthermore, Georgas (2014) showed that students often choose Google for its speed and ease of use, especially when conducting initial searches. In contrast, when using a library-specific federated search tool, students adopted more organized search strategies, employing filters and carefully reviewing multiple sources. The research highlights the importance of combining library resources with popular search engines to support more in-depth and effective academic research.

Common challenges faced by university students

Hypermedia environment is associated with the risk of disorientation for the learners as it can be rather easy for them to get lost in non-linear online materials. Such disorientation can lead to negative

consequences as it creates cognitive overload and makes the material harder to understand. Therefore, it is essential that educational platforms have clearly designed interfaces to assist in proper navigation. Despite their experience in using internet, young people had difficulties with critical evaluation of the reliability of the sources, showing the necessity for additional work on development of information literacy skills. The information literacy levels among undergraduate students were evaluated by Adi et al. (2025). It turned out that although the students are quite adept at conducting basic searches, most of them have problems with the advanced facets of information literacy, like critical evaluation, effective searching techniques, and citations. This research indicated a discrepancy between students' perception of their information literacy levels and their real skills as the students tended to overestimate themselves. Baldwin et al. (2010) showed that participants had problems with applying advanced search techniques and encountered difficulties in using different search engines. The participants did not use structured keyword search technique, but rather used simple language or free-text searches for searching for information. Chu and Law (2007) researched the acquisition of information search expertise in research students, in terms of awareness about different sources. According to their results, although research students usually know about different academic sources, such as peer reviewed journal articles and books, many of them lack information about other sources of information such as government documents, data sets, and specialized databases.

The information seeking behavior of this "AI Generation" have changed the way people seek and obtain information. Users may gradually switch from search engines to generative AI for information seeking. This may lead to their defection from search services (Zhou & Li, 2024). The development of technology and methodology was investigated by Hanbury et al. (2015) within the field of IR. The authors examined technological and methodological innovations in the field which facilitate and improve the process of interaction of users with digital systems and retrieving information from them. Hanbury et al. noted that the rise in user-generated data such as tagging and reviewing also contributes to the improvement in the retrieval process and increases its efficiency and effectiveness through the provision of relevant high-quality information. According to the authors, these developments are important due to the large amount of digital information that has appeared. Yebowaah and Owusu-Ansah (2020) studied the information access skills among students of a college of education in Ghana. The study revealed that despite the awareness of different sources of information, students lack information access skills. Most students used simple Internet searching techniques such as Googling without knowledge of any academic databases or library resources.

Strategies for improving web search

The emphasis on information literacy was laid by Head and Eisenberg (2009) as a tool to enhance the usage of Web searches by the students in their studies. In addition to that, Chu and Law (2007) concluded that training in sophisticated search techniques and broad understanding of different sources would help research students to access reliable and relevant information. Furthermore, Hanbury et al. (2015) pointed out that the improvement in search algorithms, user interfaces and personalization options allows search systems to be more responsive and proactive in regards to user requests. emphasized the importance of search tools and user trainings in order to help people to navigate the Internet and obtain accurate information. Finally, Rowlands et al. (2008) encouraged libraries and universities to adopt new approaches to satisfy changing student needs and provide them with tailor-made resources and trainings. Furthermore, Yebowaah and Owusu-Ansah (2020)



emphasized the need for improved information literacy programs to equip students with the skills to navigate digital and academic resources more effectively. Additionally, Baldwin et al. (2010) conducted a study and they suggested information literacy training for improving student utilization of web searches for research.

5. Discussion

The current study set out to identify the various kinds of information searching strategies and retrieval techniques that students typically employ for their academic and research endeavors. Besides, this study also aimed to ascertain strategies for improving students' utilization of web searches for research and also investigate the common challenges and obstacles faced by students in their information searching processes.

Regarding various information searching strategies employed by students in academic contexts

University students' ways of searching for information online relate to their grades. It compares basic and advanced search techniques and finds that using more sophisticated approaches tends to predict better academic performance. Interestingly, the importance of traditional search methods remains strong in fields like the humanities, while advanced methods become more common and useful as students' progress (Weber et al., 2018). examined investigated the advanced search skills of undergraduate students in tertiary education and found that, despite frequent internet use for academic purposes, students demonstrated limited practical application of advanced search techniques such as Boolean operators and phrase searching. The authors emphasized the need for formal instruction in advanced search strategies and recommended integrating information literacy and e-resource navigation training into university curricula to improve students' research competencies (Uddin et al., 2025). Habibi (2007) said that effective elements in information retrieval included choosing the right keywords, figuring out synonyms and the link between terms, and using Boolean operators correctly. Ardebil University of Medical Sciences faculty members knew very little about searching tools and had never utilized Boolean operators. Students developed their search tactics via trial and error. Numerous of them adopted the often-observed actions of inexperienced users and made small adjustments to their keyword search. The advantages of using a controlled vocabulary when searching to increase accuracy and comprehensiveness are foreign to the students participating in this study. Furthermore, it seems that these kids have little idea how search engines find possibly relevant information. As a result, people are unaware of the limits associated with using just one search engine. Nikolopoulou and Gialamas (2011) found that student's frequency of using search engine, most of the students in their study (20% and 73.6%, respectively) said they used Google "usually" or "always" to discover information academic purposes, 82.4% students used Google as "Always" for personal purposes and Yahoo is used significantly less frequently than Google (11.6% and 3.6%, respectively) for the same frequencies and academic purposes. Even though Google is one of the most popular Web search engines (Anagnostopoulos, 2010), students' reliance on a single search engine and their frequent lack of critical analysis of online sources may restrict the quality of the information they are able to find. Callinan's study (2005) revealed that books, lecture notes, and websites were the top three information sources for both first- and final-year undergraduate students. This suggests that Web searching is a more routine activity than, say, database searching, where the percentage was only 20%. Head and Eisenberg (2009) found that 96% of students begin their academic research using search engines like Google, while only 94% turn to scholarly databases as a first step as well as Wikipedia 85%. Whereas Brophy and Bawden (2005) found that 70% students use Google and 50% use library resources. Similarly, Tsai et al. (2012) found that daily searches are typically conducted using simpler methods more well-known subjects. Ay and Erdem (2020) found that the students had an intermediate degree of OISS (Online Information Searching Strategy).

Potential difficulties faced by students in their information searching processes

Head and Eisenberg (2009) found that students often face a variety of challenges that hinder their ability to find relevant and credible data. One primary issue is the lack of proper search skills, particularly in formulating effective queries. Students frequently struggle with selecting the right keywords or using advanced search strategies, resulting in either excessive irrelevant results or too few relevant ones. Klucsevsek and Brungard (2016) also revealed reveal a better understanding of how students find and approach scientific literature. Bawden and Robinson (2009) found that there is another obstacle i.e., information overload, a common issue in the digital age where students are bombarded with an overwhelming amount of data. The vast quantity of information available online makes it difficult for students to sift through and evaluate the reliability of sources. This often leads to confusion and poor decision-making when choosing which sources to trust or cite. Hargittai et al. (2012) found that the increasing quantity of webpages has also brought to light issues like information overload, disarray, and declining information quality. Additionally, Kahraman (2021) revealed that vast amount of information is accessible through the Web and there is no assurance of its accuracy and trustworthiness. Baldwin et al. (2010) revealed that the participants didn't know how to utilize complex search techniques and had issues with all of the search engines they tried, including Google, Metalib, the Library OPAC system, and particular databases. There was no indication that structured word searching with carefully chosen keywords was taken into consideration by any of the participants, and all of them created inquiries using straightforward language or free text.

Regarding strategies for improving students' utilization of Web searches for research

Students used internet both generally and to visit particular websites, they revealed that most popular search engine was Google. The research holds particular significance for educators teaching the curriculum relevant to the study. However, the wider consequences of persistent signals of deficiencies in students' information literacy abilities suggest that schools should bear a greater share of the burden for providing instruction in information literacy. Relying solely on post-secondary education for skill development will not guarantee that citizens possess the necessary skills to properly engage in 21st century living, whether in the workplace or in their personal lives. Additionally, Baldwin et al. (2010) conducted a study and they suggested information literacy training for improving student utilization of web searches for research. Kim (2009) conducted a study and the study's findings are meant to aid in the creation of task-based information-seeking models and to make additional recommendations for Web information system designs that accommodate users' various duties. Information literacy skills for improving students' utilization of Web searches for research.

6. Conclusion

The current study provided information on evaluating information searching strategies among the university students. This research also offers a thorough comprehension of the information-searching techniques used by university students. The study identifies and categorizes various information searching techniques, examines the most commonly used resources, and investigates the challenges students face in retrieving reliable information. The findings highlight the importance of information literacy in academic success and provide recommendations for enhancing search effectiveness. Nevertheless, the research also reveals notable deficiencies in students' proficiency with academic databases and sophisticated search methods like Boolean operators, which limits the depth and quality of research. The difficulties students encounter, such as their lack of digital literacy and information overload, highlight the necessity of focused interventions to improve their information literacy. However, the study was conducted based on secondary data. If it becomes possible to collect primary data, then the result would be more comprehensive and fruitful. Consequently, more research is recommended to have a thorough grasp of students' web seeking self-efficacy. In addition, to support their scholarly study and academic endeavors, pupils ought to be knowledgeable about various kinds of information-searching strategies and sources.

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