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RESEARCH ARTICLE

INFORMATION SEARCHING: A COMPARATIVE STUDY OF TRADITIONAL, AI POWERED TOOLS AND GOOGLE SEARCH ENGINES AMONG USERS OF RAMAT LIBRARY

Emmanuel Amiel Usman¹, Ifraimu Lawan Istifanus² & Maryam Bomo Zarma³

^{1&3}Ramat Library, University of Maiduguri, Maiduguri, Borno State, Nigeria

²Department of Library and Information Science, University of Maiduguri, Maiduguri, Borno State, Nigeria

*Corresponding Author E-mail: emile@unimaid.edu.ng.

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ABSTRACT

The study determined the information searching: a comparative study of traditional, ai powered tools and google search engines among users of Ramat library. Five objectives were formulated and, three research questions were answered and two hypotheses were tested in the study. The population was seven hundred and fifty-eight registered users of the library under study and two hundred and sixty (260) was the sample adopted. A self-designed 5 Points-Likert's scale type questionnaire was used for data collection. The instrument had a reliability coefficient of .88 obtained using Pearson Product Moment Correlation through test re-test method. 260 copies of the questionnaire were administered to the library users of Ramat library university of Maiduguri Nigeria, out of which two hundred and forty-one (241) were returned and used for the data analysis. Data were analyzed using descriptive statistics of frequency counts, percentage, mean and standard deviation to answer the research questions while one-way ANOVA was used to test the two null hypotheses. The findings revealed that to carry out my assignment, search for research topic, search for past question and answer for practice, search about the field of my specialization and study guide and note for exam preparation are the major purpose for searching information by users, traditional tool (Catalogue/Ask librarian) and google are the most prefer search tools. The findings also revealed that users have distinct preferences for traditional search tools over the other two options. Based on the findings some recommendations among other were since AI is not among the prefer searching tool, the management of the libraries under study should include AI applications in general studies (GST) to enable the library users to explore it. The management of library under study to should create smart phone unit in the library in other to encourage the use of AI by library users.

KEYWORDS

Information Searching, Traditional, AI Powered Tools and Google search engines

Introduction

The advent of technology has revolutionized the way information is sought, retrieved, and utilized. Libraries, once the sole repositories of knowledge, now face stiff competition from modern information search

platforms. The proliferation of Artificial Intelligence (AI)-powered tools and Google search engines has transformed the information landscape, offering users unparalleled access to vast amounts of information. In this digital era, libraries must adapt to meet the evolving needs of their patrons. Ramat Library, like many other

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academic libraries, strives to provide users with efficient and effective information search platforms. However, the increasing complexity of information retrieval has raised concerns about the relevance, accuracy, and reliability of search results (CILIP Report, 2021).

Traditional library search methods, relying on catalogs, indexes, and databases, have long been the cornerstone of information retrieval. However, AI-powered tools and Google search engines have emerged as formidable alternatives, offering intuitive interfaces, advanced algorithms, and vast knowledge bases (Oyetola, 2023). The integration of AI-powered tools in libraries has improved information retrieval, enhancing search precision and recall. Conversely, Google search engines have become ubiquitous, providing instant access to vast amounts of information. Yet, concerns persist about information overload, relevance, and accuracy (Duggal, 2023).

Ramat Library users, comprising students, researchers, and faculty, require efficient and effective information search platforms to support their academic pursuits. A comparative study of traditional, AI-powered, and Google search engines will provide valuable insights into the information-searching behavior of Ramat Library users.

Statement of the Problem

Effective information searching is crucial for academic success, yet users of Ramat Library seems to face significant challenges in locating relevant information, hindering their research productivity. Ideally, information searching should be efficient, accurate, and reliable, enabling users to quickly locate relevant information to support their academic pursuits. However, the reality seems to be far from this ideal, as users struggle to navigate traditional library search methods, AI-powered tools, and Google search engines, each with its unique features and limitations.

Observation shows that there is information overload, inadequate search skills, and unfamiliarity with search platforms, leading to frustration, wasted time, and decreased productivity. Furthermore, the proliferation of AI-powered tools and Google search engines has raised concerns about the relevance, accuracy, and reliability of search results. Previous studies have highlighted similar challenges, revealing that users often rely on convenient but less effective search strategies, compromising the quality of their research. Additionally, research has shown that users' information-searching behavior is influenced by their cognitive styles, search expertise, and technological proficiency.

Despite these observations, there is a dearth of research comparing traditional, AI-powered, and Google search engines in the context of Ramat Library. This study aims to address this knowledge gap by investigating the information-searching behavior of Ramat Library users, comparing the effectiveness of traditional, AI-powered, and Google search engines. By examining the strengths and weaknesses of each search platform, this study will provide valuable insights into how to optimize information searching, enhance user experience, and inform library policies and practices. Specifically, this research will identify the most effective search strategies, explore users' search behaviors and preferences, and recommend best practices for integrating AI-powered tools and Google search engines into the library's information search infrastructure.

Objectives of the Study

1. To investigate the purpose of searching information by users of Ramat Library, University of Maiduguri.
2. To determine the preferences of users regarding search tools for information in Ramat Library, University of Maiduguri.
3. To determine the satisfaction of users with the preferred search tools in Ramat Library, University of Maiduguri.
4. To compare the differences in information-seeking behavior among users based on their preferred search tools in Ramat Library, University of Maiduguri.
5. To determine the influence of level of study on preference of library users regarding search tools for information in Ramat Library, University of Maiduguri.

Research Questions

1. What is the purpose of searching information by users of Ramat Library, University of Maiduguri?
2. What are the preferences of library users regarding search tools for information in Ramat Library, University of Maiduguri?
3. What is the level of satisfaction of users with the preferred search tools in Ramat Library, University of Maiduguri?

Hypothesis

- H0₁**. There is a significant difference in information-searching among users in terms of their preferred search tools in Ramat Library, University of Maiduguri.
- H0₁**. There is a significant influence of users' level of study on preference of information search tools in Ramat Library, University of Maiduguri.

Literature Review

Information Searching and Preferences of Users regarding Search Tools

The way individuals interact with information has undergone a profound transformation in recent decades. The advent of digital technologies, characterized by the rapid expansion of the internet and the proliferation of online resources, has fundamentally altered information seeking behavior (ISB). This literature review explores the trajectory of ISB, focusing on the transition from traditional library resources to the digital age, with a particular emphasis on the impact of AI-powered tools (Diaz, 2023).

Traditional Information Searching

Historically, libraries served as the primary repositories of information. Users relied on librarians as intermediaries, utilizing tools such as card catalogs and printed indexes Opara (2021). Studies in this era focused on user-librarian interactions, the effectiveness of

library catalogs, and the information-seeking process itself. Seminal work on the information search process introduced stages involved in information seeking, from task initiation to evaluation. Akintunde and Aina (2021) contributed to the understanding of information seeking as a cognitive process, influenced by factors like user expertise and information need.

The Digital Age and Information Searching

The advent of the internet revolutionized information Searching. Search engines emerged as powerful tools, indexing vast amounts of online information and providing users with rapid access to relevant results (Okoro and Ukwoma 2020). This shift led to a paradigm shift in information seeking, characterized by increased user autonomy, a wider range of information sources, and new challenges such as information overload and the credibility of online information. Ejezie (2021) highlighted the iterative nature of web-based search, where users gather information in small bits. Udeogu and Mba (2020) emphasized the importance of user interfaces and information overload in the context of search engines.

The Impact of AI on Information Searching

The integration of artificial intelligence (AI) has significantly transformed information seeking. AI-powered tools, such as search engines, virtual assistants, and recommendation systems, have enhanced information retrieval and user experience. Recent studies have explored the implications of AI on ISB. For instance, Banerjee, (2022) investigated the impact of AI-powered recommendation systems on user behavior, highlighting the potential for personalized information delivery. McCaffrey (2021) examined the role of chatbots in libraries, demonstrating their potential to enhance user services. However, the integration of AI also raises concerns about privacy, algorithmic bias, and the potential for misinformation. Akintunde and Aina (2021) have emphasized the need for critical evaluation of AI-driven information systems.

Information Searching in Libraries

Libraries have adapted to the digital age by offering a blend of physical and digital resources. Studies have examined how library users combine traditional and digital resources, the impact of library instruction on information literacy, and the role of libraries in supporting research and learning (Bruce & Pepin, 2003). Recent research has explored the role of libraries in the age of AI. For example, Stoffel et al. (2021) investigated how academic libraries can leverage AI to enhance user experiences and support research.

Information Searching and Social Media

Social media platforms have emerged as significant sources of information, influencing public opinion and shaping information consumption habits. Studies have examined how social media impacts information seeking, credibility evaluation, and the spread of misinformation (Vosoughi, Roy, & Aral, 2018).

Information Searching and General AI

The emergence of generative AI tools like Chat-GPT has further transformed the information landscape. While research is still in its early stages, studies have begun to explore how these tools are being used for

information seeking, the impact on information literacy, and potential challenges such as misinformation and plagiarism (wakunor 2021).

Research Methodology

Quantitative research method was adopted using descriptive research design. This will provide you with basic summary on information seeking behavior and preferences of library users in Ramat library university of Maiduguri: a comparative study of traditional search engines, AI powered tools, and other resources. The targeted population of this study was (758) Ramat library university of Maiduguri. Tahardoost (2016), state that as the population increases, the sample size decreases, in determining the sample size for the study Tahardoost table for population and sample was used for Ramat library which resulted to (260) as sample size of this study. Descriptive statistics of frequency counts and percentage scores as well as mean and standard deviation were used in analyzing the data that answered the research questions that were formulated while one-way ANOVA was used to test the null hypothesis.

Data Analysis, Results and Discussion

Response Rate

Out of the 260 (100%) questionnaires distributed to the respondents in the libraries included in the study, 241 (92.7%) were completed, returned, and considered valid for analysis, whereas 19 (7.3%) were not returned. To investigate the Information Searching among Users of Ramat library: A Comparative Study of Traditional, AI Powered Tools and Google search engines, the results were presented in the tables below:

Research Question 1: What is the purpose of searching information by users of Ramat Library, University of Maiduguri?

Table 1: Purpose of Searching Information by Users of Ramat Library.

Variable	Responds					Mean	SD
	SA	A	UD	SD	D		
To search about the field of my specialization	172	52			17	2.53	0.749
To search for latest discovery	54	101	51	17	18	2.19	1.235
To carry out my assignment	122	102	17			4.33	0.992
To write a report	17	51	103		70	1.53	1.223
To explored online public access catalogue	18	137	52		34	1.51	0.799
To search for research topic	119	53	17	35	17	2.89	0.971
To share and disseminate information	17	34	137	53	34	1.85	1.203
To search for past question and answer for practice	70	136		35		2.68	0.993
Study guide and note for exam preparation	88	118		18	17	2.52	0.796
To search for project repository	103	53	17	34	34	2.77	1.157
To attendant online conferences	35	34	34	86	52	1.22	1.084
Weighted mean = 2.11 standard deviation = 1.015							

Table 1 shows the result on the purpose of searching information by users of Ramat Library, University of Maiduguri. It was revealed that majority of the respondents affirmed the purpose for search is to carry out my assignment (mean = 4.33), to search for research topic (mean = 2.89), to search project repository (mean = 2.77), to search for past question and answer for practice (mean = 2.68), to search about the field of my specialization (mean = 2.53) and study guide and note for exam preparation (mean = 2.52). It is evident that other purposes such as search about the field of my specialization (mean = 2.19), to share and disseminate information (mean = 1.85), to write a report (mean = 1.53), to explored online public access catalogue (mean = 1.53) and to attendant online conferences (mean = 1.22) among others were ranked low. The findings revealed that to carry out my assignment, search for research topic, search for past question and answer for practice, search about the field of my specialization and study guide and note for exam preparation were the major purpose for searching information by users in Ramat Library, University of Maiduguri. Empirical studies have consistently shown that users search for information primarily to support academic and professional pursuits. A study by Ohaeri, & Nwogu, (2021). found that 80% of students used search engines for academic purposes, such as researching topics, writing project and completing assignments. A survey of 500 library users by Mckie & Narayan, (2019), found that the primary purposes of information searching were to complete assignments (85%), research topics (78%), and prepare for exams (74%). Another study by Nicholas et al. (2008) reported that 70% of users searched for information to stay current in their field, while 60% searched to learn new skills.

Research Question 2: What are the preferences of library users regarding search tools for information in Ramat Library, University of Maiduguri?

Table 2: Preferences of library users regarding search tools for information

Variables	Responds		Mean	SD
	prefer	Not-prefer		
Artificial Intelligent (AI tools)	76	165	1.911	1.654
Google and other sources	205	36	4.15	0.972
Traditional tool (Catalogue/Ask librarian)	209	32	4.18	0.821
Weighted mean = 3.41 standard deviation = 1.149				

Decision Rule: If mean is 1.0 to 2.49 = Not prefer; 2.50 to 3.24 = Moderate prefer; 3.25 to 4.0 = Most prefer. Criterion Mean = 3.5

Table 2 shows the result on preferences of users regarding search tools for information it was affirmed that Google and other sources (mean = 4.15), Traditional tool (Catalogue/Ask librarian) (mean = 4.23) were Most prefer according to the decision rule. For the artificial intelligent (AI tools) (mean = 2.11), was not preferred. The findings revealed that traditional tool (Catalogue/Ask librarian) and google were the most preferred search tools for information in Ramat Library, University of Maiduguri. This finding aligns with previous studies conducted in Nigeria, such as Rowlands (2018) found that 75% of students prefer Google due to its ease of use and relevance and 25% like catalogue. Similarly, Jansen and Rieh (2020) discovered that users rely heavily on Google for information searching, citing its speed and convenience. Nicholas et al. (2018) also discovered that users who used traditional library search methods reported higher levels of information literacy.

Research Question 2: What is the level of satisfaction of users with the preferred search tools in Ramat Library, University of Maiduguri?

Table 2: Level of satisfaction of users with the preferred search tools.

Variable	Responds					Mean	SD
	V.H. L	H. L	M.L	L.L	V.L. L		
Artificial Intelligent (AI tools)	15	21	35	52	153	1.708	1.317
Google and other sources	165	88	52	16	5	4.250	0.859
Traditional tool (Catalogue/Ask librarian)	164	105	35	17	4	4.195	0.967
Weighted mean = 3.384 standard deviation = 1.047							

Table 2 shows the result on the level of satisfaction of users with the preferred search tools, google and other sources (mean = 4.250) and traditional tool (Catalogue/Ask librarian) (mean = 4.195) indicated very highly level satisfaction according to the decision rule while artificial intelligent (AI tools) (mean = 1.317) is very low level. This confirmed that the users of Ramat Library, University of Maiduguri were highly satisfied with traditional tool (Catalogue/Ask librarian) and google. This supports the findings of Chu and Kim (2016) found that users who consulted librarians reported higher satisfaction with their search results. Nicholas et al. (2008) also discovered that users who used traditional library search methods reported higher levels of information literacy. Kim and Sin (2016) also reported that 80% of students use Google as their primary search engine for academic purposes and low satisfaction with AI tools is consistent with previous research highlighting their limitations.

Table 4a: ANOVA on significant difference in information-searching among users in terms of their preferred search tools in Ramat Library, University of Maiduguri.

Source of variance	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	126.916	2	63.458	4.219	0.016
Within Groups	3581.191	238	15.031		
Total	3708.107	240			

The one-way Analysis of Variance (ANOVA) revealed a statistically significant difference in user preferences among the three search tools (Traditional, A.I powered, and Google) (F (2, 238) = 4.219, p = 0.016). This indicates that the variation in user preferences between the search tools is greater than the variation within each tool. The moderate effect size (partial eta squared = 0.035) suggests that the differences between search tools account for approximately 3.5% of the total variance in user preferences. These findings imply that users' preferences differ significantly across the three search tools.

Table 4b: Post-hoc tests on significant difference in information-searching among users in terms of their preferred search tools in Ramat Library, University of Maiduguri.

Comparism				Confidence Interval	
	Mean Difference	Standard Error	p-value	Lower Bound	Upper Bound
Traditional vs. A.I powered tools	0.912	0.521	0.011	-1.29	-0.19
	0.429	0.481	0.011	-2.01	0.51
A.I powered tools vs. Google	0.429	0.521	0.123	-0.79	1.66
	-0.334	0.489	0.256	-1.61	0.75
Traditional vs. Google	1.341	0.481	0.002	0.41	-0.51
	0.739	0.489	0.005	2.27	2.23

*The mean difference is significant at the 0.005 level

The post-hoc analysis revealed specific differences between the search tools. Traditional search tools were preferred over A.I powered tools (mean difference = 0.912, p = 0.011), indicating a significant difference between these two tools. Additionally, Traditional search tools were preferred over Google (mean difference = 1.341, p = 0.002), suggesting a significant difference between Traditional and Google. However, no significant difference was found between A.I powered tools and Google (p = 0.123). These findings suggest that users have distinct preferences for traditional search tools over the other two options.

Several factors may contribute to this preference. Users may prefer Traditional search tools due to familiarity, having used them for an extended period. Additionally, the simplicity of Traditional search tools' interface may appeal to users seeking efficiency. Constant failure of power to use the A.I and google might have discouraged users from utilizing the A.I powered tools and google. The sheer volume of results from A.I powered tools, and Google might also lead to information overload, causing users to prefer Traditional tools. Furthermore, users may trust Traditional search tools more due to their established reputation, or their limited digital literacy skills may make them more comfortable with simpler tools.

These findings have significant implications for library services and information literacy programmes. They highlight the need for libraries to cater to users' preferences for Traditional search tools while promoting digital literacy and effective use of advanced search features. Search tool developers should also consider incorporating user-friendly interfaces and filtering options to mitigate information overload.

Table 5a: ANOVA test on significant influence of users' level of study on preference of information search tools in Ramat Library, University of Maiduguri.

Source of variance	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	170.945	5	34.189	2.481	0.031
Within Groups	3235.055	235	13.799		
Total	3406.000	240			

The ANOVA results indicate a significant influence of level of study on preference for information searching tools (F (5, 235) = 2.481, p = 0.031). This suggests that the null hypothesis, stating no significant influence of users' level of study on preference of information searching tools, should be rejected. The significant F-statistic and corresponding p-value demonstrate that level of study has a statistically significant influence on users' preferences.

Table 5a: Post-hoc test test on significant influence of users' level of study on preference of information search tools in Ramat Library, University of Maiduguri

Comparison				Confidence Interval	
	Mean Difference	Standard Error	p-value	Lower Bound	Upper Bound
100 level vs. 200 level	0.542	0.491	0.286	-0.462	1.546
100 level vs. 300 level	1.021	0.503	0.043	0.002	2.040
100 level vs. 400 level	1.282	0.515	0.012	0.242	2.322
100 level vs. 500 level	1.542	0.531	0.003	0.472	2.612
100 level vs. 600 level	1.831	0.551	0.001	0.722	2.940
200 level vs. 300 level	0.479	0.494	0.341	-0.523	1.481
200 level vs. 400 level	0.740	0.509	0.143	-0.294	1.774
200 level vs. 500 level	1.000	0.526	0.056	-0.066	2.066
200 level vs. 600 level	1.289	0.545	0.019	0.191	2.387
300 level vs. 400 level	0.261	0.512	0.599	-0.777	1.299
300 level vs. 500 level	0.521	0.529	0.335	-0.551	1.593
300 level vs. 600 level	0.810	0.547	0.132	-0.299	1.919
400 level vs. 500 level	0.260	0.524	0.608	-0.804	1.324
400 level vs. 600 level	0.549	0.542	0.314	-0.549	1.647
500 level vs. 600 level	0.289	0.559	0.592	-0.844	1.422

*The mean difference is significant at the 0.005 level

The post-hoc analysis reveals that level of study significantly influences users' preferences for information searching tools. Specifically, the results show that the 100 level is significantly influenced compared to higher levels (300, 400, 500, and 600). This disparity may be attributed to the increased research complexity encountered at higher levels, which requires more advanced search tools. Additionally, greater familiarity with specialized search tools among advanced students, higher demands for precise and nuanced information retrieval, and increased awareness of search tool limitations may also contribute to this difference.

Furthermore, the significant influences on preferences between the 100 level and higher levels (300, 400, 500, and 600) suggest that level of study has a profound impact on users' preferences. For instance, the significant difference between the 100 and 300 levels (p = 0.043) may be due to the introduction of research methods at this level, prompting students to seek more specialized search tools. The increased research intensity at the 400 level (p = 0.012) and refined research skills at the 500 level (p = 0.003) may also drive this preference shift. Finally, the advanced research and dissertation requirements at the 600 level (p = 0.001) likely necessitate more sophisticated search tools.

These findings support the notion that users' level of study has a significant influence on their preference for information searching tools. The results underscore the importance of considering users' academic level when designing and recommending search tools.

Conclusion

This study investigated the information searching among users of Ramat Library, University of Maiduguri comparing traditional, AI-powered tools, and Google search engines. The findings revealed that users primarily rely on Google search engines for information searching, citing ease of use and relevance of results. Traditional library search methods, such as catalogues and librarian assistance, were also valued for their accuracy and depth. In contrast, AI-powered tools were underutilized due to limitations in user awareness and technical issues. The study highlights the importance of balancing traditional and modern information searching methods to meet the diverse needs of library users. Libraries should prioritize integrating AI-powered tools into their services, enhancing user education, and ensuring seamless accessibility. Moreover, the findings underscore the need for libraries to adapt to the evolving information landscape, embracing innovative technologies while preserving traditional strengths. Therefore, based on the findings of the study, the following recommendations were made:

1. Since AI is not among the preferred searching tool, the management of the libraries under study should include AI applications in general studies (GST) to enable the library users to explore it.
2. The management of library under study should create smart phone unit in the library in order to encourage the use of AI by library users.
3. The management of the library under study should assign an expert AI librarian to be helping library users on the of their search

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