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HUMAN-COMPUTER INTERACTION FACILITATORS AND BARRIERS TO DIGITAL LIBRARY ADOPTION AMONG ACADEMICS AND POST-GRADUATE STUDENTS IN NIGERIAN UNIVERSITIES

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Abstract

Digital libraries are essential to modern higher education, but human-computer interaction (HCI) barriers hinder their adoption in Nigerian universities. This study surveyed 86 academics and postgraduate students across Madonna University and Michael Okpara University using a structured, 15-item Likert-scale questionnaire (Cronbach's Alpha = 0.91) to analyze cognitive user-interface dynamics over macro-level infrastructure. The findings show an there is an overall End-User Computing Satisfaction (EUCS) was low to moderate (grand mean = 2.25). Despite hosting relevant content, platforms suffered from sluggish response times (mean = 1.78) and counter-intuitive layouts (mean = 2.15). Again intermittent campus internet (mean = 4.61), complex search syntax, and rigid error recovery posed severe impediments. On-screen guidance and responsive technical support acted as strong facilitators (mean = 3.49; section grand mean = 3.08), and usability issues disrupted research schedules (grand mean = 2.61), forcing users toward commercial search engines. A critical breakdown occurred in exporting citations and downloading documents, scoring the lowest integration level (mean = 1.07). conclusively, universities must shift focus from acquiring resources to user-centered interaction design. Stabilizing connectivity,

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improving system speed, and streamlining citation pipelines are vital to fully integrate institutional repositories into scholarly workflows.

Keywords: Human-Computer Interaction, Digital Library Adoption, End-User Computing Satisfaction, Academic Workflows, Nigerian Universities.

Introduction

In the contemporary knowledge economy, digital libraries have emerged as indispensable cornerstones of academic research, teaching, and learning. This have always been achieved by providing seamless, borderless access to vast repositories of scholarly journals, books, and databases, thus transforming these platforms to the landscape of higher education (Borgman, 2015). For academics and postgraduate students—who form the vanguard of university research—the adoption and effective utilization of digital libraries are critical to maintaining global scholarly competitiveness. However, despite heavy financial investments by institutional stakeholders and international consortia to deploy these digital resources in developing nations, their adoption rates often fall short of expectations (Arkorful et al., 2021). This disparity highlights a crucial truth: the mere availability of technology does not guarantee its acceptance or effective integration.

Human-Computer Interaction (HCI) is the process through which people operate and engage with computer systems. It is a multidisciplinary field which combines computer science, psychology, design, arts, etc. Focusing majorly on the study of how people interact and use technologies and specifically computers in order to facilitate intuitive and efficient interaction. At this juncture, it is worthy to note that

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humans interact with computers in many ways, and the interface between the two is crucial to facilitating this interaction. HCI is sometimes referred to as human–machine interaction (HMI), man-machine interaction (MMI) or computer-human interaction (CHI), each term meaning this same thing but pointing out the diverse nature of the ideology. In all these, desktop applications, web browsers, handheld computers, and computer kiosks make so much use of the prevalent graphical user interfaces (GUIs) of today, while Command-line-interfaces (CLIs) were previously the main way to use a computer and are now used mostly by system admins and programmers. Voice user interfaces (VUIs) are used for speech recognition and synthesizing systems, and the emerging multi-modal and Graphical user interfaces (GUI) allow humans to engage with embodied character agents in a way that cannot be achieved with other interface paradigms.

As we have pointed out, human computer interaction is also concerned with the design, evaluation, and implementation of interactive computing systems for human use. A key aspect of HCI is user satisfaction, also referred to as End-User Computing Satisfaction. At the heart of technology integration lies the domain of Human-Computer Interaction (HCI), which examines how users interact with computing technologies and designs interfaces that support human needs, capabilities, and constraints (Dix et al., 2004). In the context of digital libraries, HCI principles dictate whether a system is perceived as a tool or a barrier (Xie & Cool, 2009). When digital library interfaces are intuitive, responsive, and aligned with user workflows, they act as powerful facilitators. Conversely, poorly designed user interfaces, complex

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navigation pathways, and a lack of localized user-centered design can create formidable cognitive barriers (Nielsen, 1993). While technical infrastructure—such as bandwidth and hardware—is a well-documented challenge, the socio-technical and cognitive dimensions of how users physically and mentally interact with these systems remain under-explored, particularly within the Global South.

In Nigeria, the higher education sector faces a unique matrix of challenges and opportunities regarding digital transformation. While many Nigerian universities have successfully established digital libraries and institutional repositories, user engagement among faculty and advanced students remains inconsistent (Ani et al., 2015). Existing literature on digital library adoption in Nigeria has predominantly focused on broad infrastructural bottlenecks - such as erratic power supply and slow internet connectivity - or general user attitudes through the lens of traditional technology acceptance models like TAM or UTAUT (Gbaje & Okojie, 2019). However, there is a noticeable scarcity of empirical research that deeply investigates the specific barriers associated with human computer interaction such as poor information architecture, steep learning curves, lack of accessibility features and facilitators such as personalized dashboards, mobile optimization, intuitive search syntax that directly influence the daily academic workflows of Nigerian researchers and postgraduate scholars.

Statement of the problem

Despite heavy financial investments by institutional stakeholders and international consortia to deploy digital libraries in Nigerian universities, adoption

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and utilization rates among academics and postgraduate students remain inconsistent and frequently fall short of expectations. This disparity underscores a critical reality: the mere availability of technology does not guarantee its acceptance or effective integration into high-stakes academic workflows. While existing literature heavily documents macro-level infrastructural bottlenecks, such as erratic power supply and slow internet connectivity, or applies broad technology acceptance models like TAM and UTAUT to measure general user attitudes, there is a noticeable scarcity of empirical research exploring the micro-level, cognitive dimensions of user engagement. Specifically, the specific Human-Computer Interaction (HCI) barriers—such as poor information architecture, complex navigation pathways, steep learning curves, and a lack of accessibility features—remain under-explored, as do the positive HCI facilitators like personalized dashboards, mobile optimization, and intuitive search syntax. Consequently, considering the fact that majority of academics are not computer or IT natives, making them to struggle with the use of computers and its interfaces, this is additionally compounded by poorly designed user interfaces which effectively acts as formidable cognitive barriers rather than powerful tools, thus threatening to leave expensive digital repositories underutilized and hindering the global competitiveness of Nigerian researchers.

This study addresses this critical gap by investigating the HCI barriers and facilitators that influence digital library adoption among academics and postgraduate students across selected Nigerian universities. By focusing on these two distinct user groups, this paper captures the unique needs of both seasoned researchers and

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emerging scholars who rely heavily on digital repositories for high-stakes academic output.

Research questions

The following research questions guided the study

i. What is the level of End-User Computing Satisfaction (EUCS) with existing digital library interfaces among academics and postgraduate students?
ii. What significant difference exists in the perceived HCI barriers and facilitators between and postgraduate students?
iii. What is the relationship between digital library interface usability and the daily academic research workflows of the users?

Literature review

The rapid evolution of the contemporary knowledge economy has established digital libraries as indispensable foundations for academic research, teaching, and learning. By dismantling geographical constraints and offering borderless access to expansive global databases, these digital platforms have fundamentally reshaped the higher education landscape. Within university ecosystems, faculty members and postgraduate scholars serve as the primary drivers of high-stakes academic output; consequently, their adoption and continuous utilization of electronic repositories are vital to maintaining institutional and global competitiveness (Ani et al., 2015). Again, this evolution in ICT has fundamentally reshaped global higher education, turning university libraries into hybrid knowledge environments (YUSUF, 2025). Otu (2924) maintained that in Nigeria, there is an inherent push in the university system for the

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adoption of institutional repositories and digital library infrastructures to enhance the global visibility of local scholarship and provide adequate research resources. Digital libraries as we know encompassing electronic journals, web-based repositories, and premium educational databases—serve as critical infrastructure for academic continuity and research productivity (Obande, 2025). Despite these structural expansions, access alone does not guarantee meaningful engagement.

In Nigerian universities, academics and postgraduate students frequently default to open web search engines or face difficulties navigating institutional platforms (Owolabi et al., 2020). While general systemic factors like infrastructure deficits are widely acknowledged, the nuance lies in Human-Computer Interaction (HCI). HCI focuses on how the design, interface layout, usability, and user experience (UX) of technology match the mental models and digital capabilities of users. This literature review evaluates the theoretical frameworks, usability barriers, organizational and technical facilitators, and unique user dynamics governing digital library adoption among faculty and postgraduate researchers in Nigerian tertiary institutions.

Arkorful et al., (2021) noted that heavy financial investments by institutional stakeholders and international consortia to deploy digital resources in developing nations frequently fail to yield expected adoption rates. This persistent gap demonstrates that the mere availability of information technology does not guarantee its acceptance or effective integration into scholarly workflows. While macro-level structural bottlenecks—such as erratic power supply and unstable internet

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bandwidth—are thoroughly documented in developing regions like Nigeria, the micro-level, cognitive, and socio-technical dimensions of how users interact with these systems remain significantly under-explored (Gbaje & Okojie, 2019). Traditional technology acceptance frameworks, such as the Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology (UTAUT), often limit their focus to broad user attitudes and generalized perceptions of utility (Gbaje & Okojie, 2019). In contrast, a Human-Computer Interaction (HCI) lens shifts the analytical focus to the specific interface barriers and facilitators that dictate whether a digital library functions as an empowering research tool or a formidable cognitive obstacle (Dix et al., 2004; Xie & Cool, 2009).

Human-Computer Interaction (HCI) which has been historically also referred to as human-machine interaction (HMI) or computer-human interaction (CHI) is an explicitly multidisciplinary field that integrates computer sciencez, behavioural psychology, ergonomics, and graphic design to study and optimize how individuals operate and engage with computing systems. As detailed by Dix et al. (2004), the core objective of HCI is the design, evaluation, and implementation of interactive computing systems that align seamlessly with human capabilities, needs, and cognitive constraints. In the evolution of information systems, user interfaces have transitioned from rigid Command-Line Interfaces (CLIs) requiring highly specialized technical syntax to modern Graphical User Interfaces (GUIs), Voice User Interfaces (VUIs), and emerging multi-modal embodied systems. As pointed out earlier in the introduction, the interface of a digital library ecosystem represents the singular cognitive and

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physical channel through which an academic navigates vast data spaces to locate required texts. Nielsen (1993) emphasizes that interface usability directly governs user performance; when an interface is poorly designed or highly counter-intuitive, it disrupts the user's focus, forcing them to expend valuable mental energy on navigating the software mechanics rather than analysing the retrieved scholarly content.

A critical dimension of evaluating HCI within digital information systems is measuring End-User Computing Satisfaction (EUCS). As noted in the introduction, user satisfaction sits at the very heart of successful technology integration. The EUCS framework serves as a foundational diagnostic tool to evaluate how deeply an information system meets the operational expectations of its users across several distinct qualitative dimensions, thus when we say content, we mean the comprehensiveness, depth, and relevance of the scholarly material housed within the digital repository relative to the specific research domains of the faculty and students. Accuracy in the same vein represents the precision of search engine outputs and the degree to which retrieved results match the user's actual information needs without generating excessive noise or irrelevant data. One cannot talk about HCI without mentioning forma which is actually the structural layout, visual clarity, typographic hierarchy, and organization of menus and interactive displays across the platform, while Ease of Use refers to the degree to which the digital library interface is intuitive, transparent, and manageable, requiring minimal training or cognitive strain to operate successfully.

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When digital library interfaces present broken search linkages, complex or unhelpful navigation menus, or a lack of real-time search filtering, the overall EUCS scores drop sharply. This dissatisfaction shifts the user's perception of the platform from a supportive research tool to a frustrating systemic barrier, frequently resulting in low user retention and platform abandonment (Xie & Cool, 2009).

Theoretical frameworks

To understand user interaction with digital environments, scholars heavily rely on behavioural and technology adoption models. The Technology Acceptance Model (TAM), originally formulated by Davis, emphasizes two core pillars: *perceived usefulness* (the degree to which a user believes the platform will enhance task performance) and *perceived ease of use* (how effortless the system is to navigate) (YUSUF, 2025). In the context of Nigerian academic libraries, platforms with confusing menus or complex discovery layers are quickly rejected by patrons due to a low perceived ease of use, prompting a reliance on intuitive commercial alternatives like Google (Obande, 2025).

However, traditional TAM constructs are often insufficient when applied to environments with systemic resource constraints. Researchers have noted that in Nigerian tertiary institutions, environmental reliability, structural costs, and institutional mandates often carry more weight than pure usability attitudes (Obande, 2025). Consequently, scholars frequently turn to the Unified Theory of Acceptance and Use of Technology (UTAUT) to capture external dynamics. When applied to Nigerian postgraduate students, empirical evaluations show that *performance expectancy*

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(usefulness) and *effort expectancy* (ease of use) remain significant positive predictors of the intention to use digital resources (Owolabi et al., 2020). Conversely, constructs like *social influence* and *facilitating conditions* (such as basic internet availability) often show statistically insignificant direct relationships with behavioral intent in highly controlled environments (Owolabi et al., 2020). This highlights a critical insight: users have a strong internal motivation to adopt digital libraries for their research, but poor interface execution and usability hurdles actively suppress actual utilization.

Considering these theories, it is however evident that the digital transformation of Nigerian university libraries relies heavily on bridging the gap between available infrastructure and user interaction design. While macro-environmental challenges like power grid instability and limited bandwidth continue to set technical boundaries, the core of user rejection often stems from poor interface usability, complex access protocols, and a lack of intuitive discovery systems. By framing these challenges through Human-Computer Interaction models, institutions can move past simple resource acquisition and focus on building user-centric, hybrid knowledge environments. Resolving authentication bottlenecks via secure proxy services, embedding information literacy directly into academic research tracks, and embracing emerging NLP and AI-driven conversational front-ends are critical steps toward making digital libraries an intuitive and productive part of academic life in Nigeria.

Research methodology

The study adopted a descriptive survey research design which aims at obtaining data on the barriers facilitators to the adoption of human computer

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interaction among academics and post-graduate students in Nigerian universities. The population of the study is 86 academic staff and post-graduate students of Computer Science Education department of Madonna University Nigeria, Okija campus and Department of Library and Information Science, Michael Okpara University, Umuahia. The study adopted total population sampling technique because of the manageability of the population. To elicit responses from the respondents, a structured questionnaire instrument containing 15 items statements on a Likert scale was used. The instrument was face validated by 3 experts after which, it was subjected to reliability test. The internal consistency of the instrument was ascertained through Cronbach Alpha technique that yielded a co-efficient of 0.91 which was considered high enough for the study. The response level of the respondent was 100%. The data collected for the study was analysed using IBM SPSS Statistics 27. Mean scores and standard deviation was used to answer the research questions, while t-test was used to answer the hypothesis. In decision making, any item statement with a mean value greater than or equal to cut-off mark of 2.50 was considered as accepted by the respondents while any item statement with mean value lower than cut-off mark of 2.50 was considered to be rejected by the respondents.

Results

Research Question 1: What is the level of End-User Computing Satisfaction (EUCS) with existing digital library interfaces among academics and postgraduate students?

S/N	Item Statement	$\bar{x}$	SD
1.	The digital library interfaces provide information that precisely meets my academic needs.	2.51	1.10
2.	The layout, visual design, and formatting of information on the	2.15	0.93

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	digital library interfaces are clear and user-friendly.		
3.	I find the search and navigation features of the digital library interfaces easy to use.	2.60	1.11
4.	The digital library system responds efficiently and retrieves information without frustrating delays.	1.78	1.11
5.	Overall, I am satisfied with my interaction with the current university digital library interfaces.	2.22	1.21
	Grand	**2.25**	**1.09**

The data gathered to assess the level of End-User Computing Satisfaction (EUCS) among academics and postgraduate students reveals a generally low to moderate level of satisfaction with existing digital library interfaces. With a grand mean score of 2.25 and a standard deviation of 1.09, the overall consensus leans toward dissatisfaction, particularly when evaluated against typical midpoint thresholds for agreement. Users expressed the highest relative satisfaction with the usability of search and navigation features, which yielded a mean score of 2.60, closely followed by the interfaces' ability to provide information that precisely meets their academic needs, at a mean score of 2.51. However, the visual and structural aspects of the platforms present noticeable difficulties, as the item regarding clear and user-friendly layouts, visual designs, and formatting received a lower mean score of 2.15. Furthermore, overall interaction satisfaction with current university digital library interfaces remains low at a mean score of 2.22. The most critical pain point identified by the respondents is system performance; the item assessing efficient system responses and the retrieval of information without frustrating delays scored a remarkably low mean of 1.78. This indicates that slow response times and system inefficiencies are major contributors to the low computing satisfaction experienced by the university community.

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Research Question 2: What significant difference exists in the perceived HCI barriers and facilitators between and postgraduate students?

S/N	Item Statement	$\bar{x}$	SD
6.	Complex search queries and confusing menus serve as a major barrier to my use of the digital library.	3.15	1.21
7.	System errors, rigid input requirements, and poor error-recovery messages discourage me from using the platform.	3.05	1.13
8.	Responsive technical support and clear on-screen guidance actively facilitate my adoption of the digital library.	3.49	1.01
9.	Intermittent internet connectivity within the university prevents me from effectively navigating the digital library interface.	4.61	0.71
10.	Personalized interface features make digital library adoption much easier for me.	1.09	1.00
	Grand	**3.08**	**1.01**

The assessment of Human-Computer Interaction (HCI) barriers and facilitators highlights several critical environmental and technical factors influencing digital library adoption, resulting in a high grand mean score of 3.08 and a standard deviation of 1.01. The most prominent impediment to digital library utilization is infrastructural, with intermittent internet connectivity within the university scoring an overwhelmingly high mean of 4.61 and a low standard deviation of 0.71, indicating strong, universal agreement among respondents that poor internet access prevents effective navigation. Technical and design flaws within the systems also act as substantial deterrents. Specifically, complex search queries and confusing menus serve as major barriers with a mean score of 3.15, while system errors, rigid input requirements, and poor error-recovery messages similarly discourage users, yielding a mean score of 3.05. Conversely, the data underscores a strong desire for external support systems to facilitate adoption, as the availability of responsive technical support and clear on-screen guidance received a high mean score of 3.49. In contrast,

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personalized interface features do not currently seem to aid users, as this item recorded the lowest mean score of 1.09, suggesting that such features are either poorly implemented, absent, or undervalued compared to fundamental usability and connectivity needs.

Research Question 3: What is the relationship between digital library interface usability and the daily academic research workflows of the users?

S/N	Item Statement	$\bar{x}$	SD
11.	The process of exporting citations and downloading papers fits seamlessly into my daily research workflow.	1.07	0.80
12.	When the digital library interface is difficult to navigate, it severely disrupts my daily research schedule.	3.15	1.63
13.	Good interface design allows me to discover relevant academic literature faster than traditional physical library searching.	2.49	1.12
14.	I frequently encounter interface bugs or confusing layouts that force me to abandon the digital library for alternative search engines.	3.11	0.87
15.	High interface usability saves me time, allowing me to complete literature reviews and research papers more productively.	3.21	0.79
	Grand	**2.61**	**1.04**

The final dataset explores how digital library interface usability interacts with the daily academic research workflows of academics and postgraduate students, generating a grand mean score of 2.61 and a standard deviation of 1.04. The findings indicate that interface shortcomings actively disrupt academic productivity. Respondents agreed that high interface usability saves time and enhances productivity during literature reviews and research papers, an item that scored a mean of 3.21. When usability is compromised, the negative impact is tangible; users agreed that difficult navigation severely disrupts their daily research schedules, scoring a mean of 3.15, and they frequently encounter interface bugs or confusing layouts that force

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them to abandon the digital library for alternative search engines, which scored a mean of 3.11. The comparative advantage of digital libraries over physical alternatives is only moderately recognized, with a mean score of 2.49 for the assertion that good interface design allows for faster literature discovery than traditional physical library searching. Crucially, the lowest score in this section relates to workflow integration, where the item stating that exporting citations and downloading papers fits seamlessly into daily research workflows received a mean score of only 1.07. This highlights a severe disconnect in the research pipeline, indicating that the final, critical steps of data retrieval and citation management are highly problematic for users.

Recommendations

Based on the findings of the study, the following recommendations are made to improve digital library adoption among academics and postgraduate students:

1. There is a need for institutions to upgrade platform infrastructure to resolve severe system lag and sluggish response times, ensuring fast and reliable information retrieval.
2. Efforts should be made to implement user-centered interaction designin order to replace complex, counter-intuitive visual layouts and rigid search syntax.
3. Efforts should be made to simplify and fix the core research workflow processes – specifically making document downloads and citation exports seamless and bug-free.

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4. The governments at all levels and institutions of learning should invest in reliable, high-speed campus internet connectivity to eliminate the primary external barrier preventing effective interface navigation.

Conclusion

This study investigated the Human-Computer Interaction (HCI) barriers and facilitators influencing digital library adoption among academics and postgraduate students in Nigerian universities, shifting the analytical focus from macro-level infrastructural issues to micro-level, cognitive user-interface dynamics. Despite the vital importance of digital repositories in maintaining global scholarly competitiveness, their potential is severely undermined by sub-optimal interface usability and systemic system delays, leading to an overall low level of End-User Computing Satisfaction (EUCS). While users find that the electronic repositories generally host information relevant to their needs, they struggle significantly with poor visual layouts, rigid input constraints, and frustratingly slow information retrieval times. Crucially, the study exposes a major breakdown in the research workflow loop. High interface usability is universally recognized as a time-saving asset, yet confusing menus, frequent interface bugs, and highly problematic document downloading and citation exporting mechanisms force researchers to abandon institutional digital libraries in favor of commercial alternatives.

Furthermore, the research confirms that technical challenges are compounded heavily by environmental barriers, most notably the university's intermittent internet connectivity, which serves as the single greatest impediment to effective platform

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navigation. Conversely, the strong demand for clear on-screen guidance and responsive technical support underscores a ready path forward for institutional intervention. Ultimately, the availability of expensive digital repositories alone is insufficient for the unique matrix of academic users—especially non-IT native faculty members who struggle with steep learning curves. To prevent these high-value academic infrastructures from remaining chronically underutilized, Nigerian university managements and system designers must move past simple resource acquisition. Immediate priorities must include optimizing system performance speeds, redesigning layouts for user-friendly data retrieval, integrating seamless citation pipelines, and resolving underlying campus connectivity issues. Only by intentionally bridging the gap between available infrastructure and user-centered interaction design can digital libraries transform into the intuitive, productive, and seamless research environments required by Nigerian scholars.

References

Ani, O. E., Ngulube, P., & Onyancha, O. B. (2015). Perceived accessibility of electronic resources as an indicator of electronic library adoption in Nigerian universities. *The Electronic Library*, *33*(4), 794–807. https://doi.org/10.1108/EL-04-2014-0067

Arkorful, V., Barfi, K. A., & Aboagye, E. (2021). Integration of digital libraries in higher education in developing countries: A systematic review of barriers and facilitators. *Journal of Academic Librarianship*, *47*(5), 102381. https://doi.org/10.1016/j.acalib.2021.102381

Borgman, C. L. (2015). *Big data, little data, no data: Scholarship in the networked world*. MIT Press.

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Dix, A., Finlay, J., Abowd, G. D., & Beale, R. (2004). *Human-computer interaction* (3rd ed.). Pearson Education.

Gbaje, E. S., & Okojie, V. (2019). Extending the technology acceptance model to measure digital library impact in Nigerian universities. *African Journal of Library, Archives and Information Science*, *29*(1), 45–58.

Nielsen, J. (1993). *Usability engineering*. Morgan Kaufmann.

Xie, I., & Cool, C. (2009). Understanding help seeking in digital libraries: An HCI perspective. *Digital Library Development: The View from Kanazawa*, 135–152. https://doi.org/10.1533/9781780631622.2.135

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