

# Evaluating Digital Library Services in Ghanaian Private Universities: Challenges and Strategic Advantages

Patience Adetsi\* and Patience Emefa Dzandza Ocloo  
Department of Information Studies, University of Ghana, Ghana  
E-mail: pdzandza@ug.edu.gh

\*Corresponding Author: patience.edinam@gmail.com

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**Abstract** - Despite the potential benefits of digital library services in private universities for improving learning outcomes and information access, there is a lack of research on the extent of their implementation and use. This study examines the availability and utilization of digital libraries in private universities in Ghana. The objectives are to determine the extent of digital library provision, assess the current state of digital library services, and identify the benefits and challenges of these services. A mixed-method approach was employed, collecting data from head librarians and student library users at Valley View University (VVU) and Pentecost University (PU) in Ghana. The findings indicate low awareness and usage among students, highlighting the need for awareness strategies. Insufficient training and support were found to impact access, while user satisfaction was linked to experiences with digital library resources and interfaces. Recommendations include tailoring digital library services to meet users' academic needs, increasing awareness to enhance usage in private universities, and addressing gaps in training and support.

**Keywords:** Digital Library Services, Private Universities, Ghana, User Awareness, Training and Support

## I. INTRODUCTION

The rapid advancement of computer and internet technologies has significantly impacted various aspects of human society, leading to substantial changes. In this digital age, traditional libraries have evolved into digital libraries, expanding beyond their conventional boundaries (Xiao, 2022). The digitization of conventional library resources has opened possibilities for unrestricted access to a vast selection of literature. Skøtt (2021) emphasizes that the overarching objective of digital libraries is to facilitate broad access to diverse collections of digital information, catering to users dispersed across different geographical locations. According to Sonker and Mahawar (2017), digital library services play a vital role in supporting library staff in organizing collections and enhancing accessibility. These services encompass a diverse range of offerings, including resource cataloging, databases, current awareness bulletins, externally purchased databases, and reference services.

Digital libraries have become an important part of education worldwide, offering diverse electronic resources to enhance learning, teaching, and research. Libraries play a crucial role in Ghana's education system, providing materials for students, teachers, and the general public. Ghana's libraries

are rapidly modernizing with the advancement of digital technology, integrating electronic resources to improve library services, make materials more accessible, and streamline operations. In Ghana, private colleges have embraced technological improvements to enhance access to information and education. Despite the potential benefits of digital library services in increasing information access and learning outcomes in Ghanaian private universities, there is insufficient research on the extent of their implementation. Previous research has primarily focused on digital library services in general and digital reference services in public universities, leaving a gap in the literature regarding the specific challenges faced by private universities in Ghana (Amofah-Serwaa, 2018; Dadzie & Walt, 2015).

Studies such as those by Dadzie and Walt (2015) and Owusu-Ansah *et al.*, (2021) assessed the existence of strategic plans or policies for developing digital libraries in selected Ghanaian universities, as well as the impact of digital libraries on seamless access to information for distance learners. While some studies have explored digital libraries in Ghana's public universities (Amofah-Serwaa, 2018; Dadzie & Walt, 2015; Owusu-Ansah *et al.*, 2021), they primarily investigated how technological advances affect the development of digital libraries in Ghanaian universities, how digital reference services support user needs, and the availability of policies and strategic initiatives for developing digital library services in Ghanaian distance education. However, more in-depth research is required, as private universities often have distinctive characteristics and challenges.

Moreover, comprehensive research on the state of digital libraries in Ghana's private universities is lacking. In light of this, the researchers conducted this study to investigate the extent of digital library provision and its challenges in Ghanaian private universities, as well as the difficulties and constraints these institutions face. The study aimed to provide insights and recommendations for improving the adoption, implementation, and maintenance of digital library services in private universities.

### A. Objectives of the Study

1. To determine the extent of digital library provision in the selected private academic libraries.

2. To assess the current state of digital library services in private universities in Ghana.
3. To identify the challenges of digital library services in private universities in Ghana.

## II. LITERATURE REVIEW

### A. Digital Libraries

The emergence of computer technology and digitalization are twentieth-century advancements, while libraries have existed for centuries. According to Sharma (2018), traditional libraries provide public access to information and knowledge from various sources and perspectives. Similarly, Tom-George and Onyema (2020) assert that digital libraries make global information accessible to people. Like traditional libraries, digital libraries select, acquire, classify, maintain, and make resources accessible by offering multiple services (Sharma, 2018; Tom-George & Onyema, 2020).

In the contemporary digital landscape, academic libraries are transitioning towards digital services. Rafiq and Ameen (2018) highlight the global engagement of academic libraries in diverse digitization services. The traditional role of academic libraries has evolved into what is referred to as “knowledge commons,” where users can access information in digital formats from remote servers, as noted by Dadzie and Walt (2015). Academic libraries, as the largest and most developed segment of libraries, play a significant role in digitizing various materials, including books, journals, newspapers, artifacts, art, music, theses, dissertations, historical documents, and culturally significant images. These digitized resources are made accessible through institutional repositories, providing electronic access to a wide range of information (Ogbomo & Muokebe, 2015). According to Jagadeeswari (2017), nearly everyone working in academic libraries today recognizes that libraries are not only about sharing information but also about creating opportunities for learning, community participation, and social capital creation. Academic libraries in India, for example, are embracing technologies that enhance communication and resource sharing (Jagadeeswari, 2017).

The extensive availability of digitized library resources enhances user access and utilization (Nwabueze & Urhiewhu, 2015). Digitized information resources are accessible over the Internet, enabling remote electronic access. These services are available only in electronic form and can be accessed via the web or institutional intranet. Dadzie and Walt (2015) emphasize that as libraries embrace the digital environment, their crucial role extends beyond providing e-resources to establishing services that facilitate effective access to available information.

According to Dzandza (2020), library digitization is integral to modern library operations, requiring librarians to make selected resources electronically available to users. Makori (2017) further asserts that the digital library service environment extends beyond information access and

utilization. It encompasses a broad spectrum of administrative, business, and curatorial functions necessary for libraries to oversee, administer, monitor engagement, and ensure equitable use of their collections - whether digital or non-digital, and whether locally or remotely situated.

Makori (2017) highlights that the digital library environment effectively manages information on collections and items throughout their lifecycle, incorporating procedures for user registration, authentication, authorization, fee-transaction processing, and databases related to patrons and lending. Khan and Bhatti (2017) support this by noting that digital libraries integrate various administrative functions to enhance service delivery. Boateng and Tindi (2022) underscore the importance of digital libraries in providing distance learners with access to resources. Ultimately, the evolving digital library service environment serves as a defining function of modern libraries, taking into account their financial and organizational sustainability.

### B. Digital Library Services

Digital library services offer a diverse range of tools aimed at assisting library staff in organizing collections and improving accessibility (Sonker & Mahawar, 2017). As highlighted by Chowdhury and Chowdhury (2004), digital libraries have revolutionized how users interact with information resources by providing various services that enhance information access and retrieval. The primary focus of digital libraries has been to facilitate access to a broad spectrum of digital information resources.

Sonker and Mahawar (2017) identify a variety of digital library services, including catalog databases, current awareness bulletins, externally purchased databases, CD-ROM databases, remote information services, internally published newsletters, reports and journals, internet information sources mirroring and cataloging, email, bulletin board services, Netnews systems, audio and video communication, electronic table of contents, electronic document delivery services, and electronic theses and dissertations. Similarly, Bera (2016) outlines a comparable list of services categorized into broader areas, such as personalized services, web-based reference and information services, search engine services, digital reference services for the general public, digital reference services for academic libraries, and cooperative digital library services.

According to Vasantha and Dhanamjaya (2018), the future of digital library services will involve library staff working even more efficiently to keep users informed about check-ins, check-outs, reservations, due dates, new arrivals, and the creation of electronic resource awareness. Mobile technology will play a significant role in achieving these advancements (Vasantha & Dhanamjaya, 2018).

### C. Digital Collection Development

The fundamental objective of establishing a digital library is to enhance access to information resources comprehensively

and seamlessly, ensure the preservation of content for future use, and facilitate interaction with other digital libraries, among other goals (Sharma, 2018). Khan and Bhatti (2017) emphasize the importance of content selection criteria, including relevance, quality, and suitability for the intended audience. According to Dadzie and Walt (2015), digital library services encompass a diverse range of resources, including digitized books, journals, articles, audiovisual materials, and archival collections. Borgman *et al.*, (2015) underscore the significance of considering user needs and preferences in the selection process. Serwaa *et al.*, (2021) note that these collections are carefully curated and selected based on their relevance, academic value, and user needs.

Digital libraries provide access to extensive collections that transcend physical boundaries, enabling users to explore a vast array of resources that may not be readily available in traditional libraries (Kistain, 2016). Digital collection development refers to the systematic process of acquiring, organizing, and maintaining digital resources in libraries (Owusu-Ansah & Rodrigues, 2022). According to Owusu-Ansah and Rodrigues (2022), libraries must develop their digital collections to meet the changing needs of their patrons in the digital age.

However, not everyone agrees on the exclusive importance of digital collection development. Physical collections still hold value and should not be neglected in favor of digital resources. On the other hand, Kistain (2016) argues that digital collection development is essential for libraries to remain relevant and meet the demands of users in an increasingly digital world. Kistain emphasizes the advantages of digital resources, such as remote access and easy searchability, which enhance the user experience (Kistain, 2016; Owusu-Ansah & Rodrigues, 2022).

#### *D. Information Retrieval*

Effective information retrieval is a crucial aspect of digital library services, enabling users to efficiently locate specific resources. Anyim (2018) emphasizes the importance of advanced search functionalities, such as keyword searching, browsing, and filtering options, in empowering users during their search process. Anyim further noted that these features provide users with flexible ways to explore digital collections and retrieve relevant materials.

Doerr *et al.*, (2007) highlighted that, in addition to search functionalities, digital libraries employ powerful search algorithms and indexing systems to ensure accurate and relevant search results. Sreenivasulu (2015) underscores the significance of comprehensive metadata and indexing practices in enhancing the discoverability and accessibility of digital materials. He stated that by incorporating descriptive metadata, subject indexing, and classification systems, digital libraries improve the organization and categorization of resources, making them more easily retrievable by users.

Ocloo and King (2022) argue that the acceptance and application of information systems (IS) in libraries have

evolved into a crucial aspect of library operations. IS represent investments made in the library and its patrons to achieve staff and user satisfaction. According to Ocloo and King, libraries must implement responsible management procedures to accomplish the ultimate goal of IS adoption. In summary, efficient information retrieval in digital libraries requires strong search algorithms, thorough metadata and indexing procedures, user-centered design principles, natural language processing techniques, and enhanced search functions. These components collectively improve the overall user experience by providing quick and accurate access to relevant information.

#### *E. Remote Access and Mobility*

Remote resource access is one of the major advantages of digital library services (Begum & Elahi, 2022). Information from digital collections can be retrieved by users whenever and wherever they have an internet connection (Shah & Waghchoure, 2018). This flexibility eliminates geographical barriers and enables researchers, students, and professionals to access resources beyond traditional library hours.

Dzandza (2020) found that, thanks to the efforts of their academic libraries, Ghanaian universities have undoubtedly established institutional repositories (IRs) as part of the global open access movement. Begum and Elahi (2022) noted that remote access to digital libraries has revolutionized scholarly research and learning, providing users with unprecedented convenience and flexibility in accessing information. Moreover, the mobility of digital library services allows users to access resources on multiple devices, including laptops, tablets, and smartphones (Fakir, 2018, 2019; Owusu-Ansah, 2021).

Begum and Elahi (2022) emphasize the importance of remote access and mobility in the modern digital library landscape. Their work highlights the convenience and flexibility it offers to users, enabling them to access resources and services from anywhere at any time. As digital libraries continue to evolve, further advancements in remote access and mobility will be critical in meeting the ever-changing needs and expectations of users.

#### *F. User Support and Services*

Digital libraries provide comprehensive user support services to assist individuals in effectively navigating their resources. These services may include user training programs, reference assistance through online chat or email, and tutorials on utilizing specific features of the digital library platform (Begum & Elahi, 2022; Witten *et al.*, 2003). Kumar and Dominic (2014) noted that libraries face new challenges, such as evolving user demographics, diverse information formats, numerous information and communication technologies, and changes in teaching and learning methods. However, most library studies reveal that few users are aware of existing library services. One issue is the limited focus on understanding users, their needs, and the services provided (Kumar & Dominic, 2014).

Librarians and information professionals play a critical role in providing guidance and support to users, helping them make the most of the digital library services available. According to Isah *et al.*, (2015), understanding customer preferences, expectations, and habits is essential to customizing support services to their unique requirements. These user support services foster information literacy, improve user experiences, and facilitate the effective use of digital library resources.

Sharma (2018) stated that digital library services have revolutionized information access and retrieval, offering users a wealth of resources, convenience, and support. Bera (2016) and Kumar (2021) emphasized that through digital collection development, advanced search functionalities, remote access, preservation efforts, and user support services, digital libraries have transformed the way users interact with information.

### *G. Opportunities for Implementing Digital Library*

Compared to traditional libraries, the knowledge society benefits significantly more from digital libraries in daily activities. The information revolution is driving an unprecedented need for knowledge storage, organization, and access, providing the technological foundation for digital libraries (Sharma, 2018). Digital libraries are likened to banks where information is invested, with knowledge serving as the currency of the knowledge economy (Sharma, 2018).

According to Witten *et al.*, (2003), digital libraries offer several advantages over traditional libraries, including lower maintenance costs, efficient resource dissemination, electronically categorized and browsable materials, equitable and widely distributed access at reduced costs, and information availability in various formats. These formats include hard copy, magnetic tapes/discs, CD-ROMs, and internet sources, which together form a sophisticated system. This system serves as the most suitable method for organizing intellectual artifacts that cannot be represented or transferred in printed formats (Sharma, 2018; Witten *et al.*, 2003).

### *H. Factors that Influence the Adoption of Digital Library*

#### *1. Technological Infrastructure*

The acceptance of digital library services heavily depends on the availability and quality of technological infrastructure. Hardware devices, accompanying software, and reliable internet connectivity are essential for enabling users to efficiently access and utilize digital library materials, according to studies by Bansode and Shinde (2019), Shah (2021), and Shah and Shah (2019). Particularly in resource-constrained environments, a lack of technological infrastructure can hinder the adoption and utilization of digital library services (Bansode & Shinde, 2019; Shah, 2021; Shah & Shah, 2019).

### *2. Perceived Ease of Use and Usefulness*

Adoption decisions are significantly influenced by users' perceptions of the usefulness and ease of use of digital library services. Perceived usefulness and ease of use are critical factors affecting users' intentions to adopt technology, as highlighted by studies from Anyim (2018) and Owusu-Ansah and Rodrigues (2022). Additional research suggests that individuals who find digital library services easy to use, intuitive, and capable of efficiently meeting their information needs are more likely to adopt them (Anyim, 2018; Dhamdhare & Ganeshkhind, 2017; Khan & Qutab, 2016; Ocloo & King, 2022; Owusu-Ansah & Rodrigues, 2022; Sharma, 2018).

### *3. Information Accessibility and Availability*

The adoption of digital library services is influenced by the availability and accessibility of digital resources. Umeozor's (2019) research highlights the importance of having an extensive collection of digital resources that are readily accessible to users. Users are more likely to adopt digital library services if they perceive a wide range of relevant and high-quality digital materials available to support their academic or research pursuits (Tabassuma *et al.*, 2015).

### *4. User Training and Support*

Adequate user training and support services are crucial for facilitating the adoption of digital library services. Research by Anyim (2018) and Tom-George and Onyema (2022) emphasizes the necessity of offering seminars, training courses, and user assistance systems to enhance users' digital competency and literacy. When users receive sufficient guidance and support to navigate and utilize digital resources efficiently, they are more likely to adopt digital library services (Anyim, 2018; Tom-George & Onyema, 2020).

### *I. Opportunities for Implementing Digital Library*

#### *1. Enhanced Access to Information*

Digital libraries provide access to a wider variety of resources than is possible with physical collections (Aviamu *et al.*, 2019; Vicente, 2013). Students and faculty can access digital materials anytime and anywhere, thus overcoming barriers of time and location (Tom-George & Onyema, 2020). This increased accessibility facilitates research, learning, and knowledge dissemination (Aviamu *et al.*, 2019).

#### *2. Support for Distance Learning*

Universities' distance learning initiatives rely heavily on digital libraries (Huwiler, 2016; Khan, 2020; Owusu-Ansah *et al.*, 2021; Adekunmisi *et al.*, 2018). Students enrolled in online courses or studying remotely can access digital resources, including e-books, journals, and multimedia materials, to support their learning needs (Begum & Elahi, 2022; Sinhababu & Kumar, 2021). This accessibility enables universities to cater to a broader student population and

expand their educational offerings (Huwiler, 2016; Khan, 2020; Owusu-Ansah *et al.*, 2021; Adekunmisi *et al.*, 2018).

### 3. Collaborative Research and Resource Sharing

Digital libraries facilitate collaboration and resource sharing among researchers and institutions (Gaona-García *et al.*, 2017). Through digital platforms and repositories, researchers can access shared datasets, scholarly publications, and research outputs, fostering interdisciplinary collaboration and knowledge exchange (Asafu-Adjaye & White, 2023; Aviamu *et al.*, 2019; Owusu-Ansah & Rodrigues, 2022). This accessibility enhances research productivity and encourages innovation (Anasi *et al.*, 2018; Asafu-Adjaye & White, 2023; DeLone & McLean, 2016; Owusu-Ansah *et al.*, 2021).

### 4. Enhanced Search and Discovery

Digital libraries leverage advanced search and discovery functionalities to facilitate efficient access to relevant resources (Bansode & Shinde, 2019; Begum & Elahi, 2022; Owusu-Ansah, 2021). Users can employ search algorithms, filters, and metadata tags to locate specific information within the digital collection (Begum & Elahi, 2022; Khan & Bhatti, 2017; Sharma, 2018; Xiao, 2022). These features enhance the discoverability of resources, saving time and effort for students and researchers (Anyim, 2018; Bansode & Shinde, 2019; Sharma, 2018).

### J. Challenges with Implementing Digital Library Libraries

Developing “effective” digital libraries poses significant challenges for both current and emerging technologies (Iwhiwhu & Eyekpegaha, 2009).

#### 1. Information Organization and Metadata Management

Effectively organizing and managing digital resources is crucial for facilitating resource discovery and retrieval (Bansode & Shinde, 2019; Sonker & Mahawar, 2017). Creating accurate and consistent metadata for each resource and ensuring proper classification and subject indexing require skilled librarians and metadata specialists (Aviamu *et al.*, 2019; Tabassuma *et al.*, 2015). Inadequate metadata management can result in difficulties in locating and accessing resources.

#### 2. User Training and Digital Literacy

Implementing a digital library requires user training and support to ensure that users can effectively navigate and utilize digital resources (Iwhiwhu & Eyekpegaha, 2009; Khan & Bhatti, 2017; Owusu-Ansah, 2021). Providing continuous training and support is vital to addressing these challenges, as many users may lack digital literacy skills, which can impede their ability to access and fully utilize the digital library (Begum & Elahi, 2022; Khan & Bhatti, 2017).

### 3. User Acceptance and Adoption

Encouraging users, including students, faculty, and researchers, to embrace and utilize digital libraries can be challenging (Khan *et al.*, 2017; Khan & Qutab, 2016). Some users may prefer traditional library resources or resist change (Tabassuma *et al.*, 2015). Promoting the benefits of digital libraries, providing user support, and addressing user concerns are critical for fostering user acceptance and adoption.

## III. METHODOLOGY

The study adopted a mixed-method approach by collecting both qualitative and quantitative data from two purposively selected private universities in Ghana: Valley View University and Pentecost University. Quantitative data were collected from student users of the library, while qualitative data were gathered through interviews with the heads of the e-library at both institutions.

The total student population of the two universities is 15,000, with Valley View University having 11,000 students and Pentecost University having 4,000 students. To determine the sample size, the researchers used the Krejcie and Morgan (1970) table, which provided a sample size of 375. This sample size was proportionately divided between the two selected institutions, resulting in 274 students being selected from Valley View University and 101 students from Pentecost University as respondents to the user questionnaire. The heads of the electronic library at both institutions were interviewed to provide in-depth knowledge of library policies, practices, and the evaluation of digital library provisions.

## IV. RESULTS OF THE STUDY

The data collected from the heads of e-libraries and students are presented under the following headings: the extent of digital library provision, awareness of digital library services, types of digital library services available, and assessment of digital library content and strategies for enhancing digital library service provision. The researchers gathered information from respondents regarding the extent of digital library provision, the current state of digital library services in the libraries, and the benefits derived from implementing and utilizing digital library services.

### A. Extent of Digital Library Provision

#### 1. Availability of Digital Library Department

The researchers sought to determine whether the two libraries have a specific department in charge of the digital library. It was revealed that one library has an e-library section responsible for the digital library, while the other library does not have a dedicated department for digital library services. The responses are as follows:

*Librarian 1:* “There is no specific department responsible for the digital library, but it is being handled by the reference and information staff.”

*Librarian 2:* “There is an e-library section in the library responsible for the digital library and its services.”

### 2. Type of Library Management Software

The researchers asked the librarians about the type of library management software used to provide digital library services in their institutions. Both respondents indicated that they use the Koha Library Management System. In addition to Koha, Librarian 1 mentioned that they have also implemented DSpace to manage their institutional repository.

### 3. Frequency of Updating Digital Library Collections

The researchers inquired from respondents about the frequency with which new resources are added to their digital library collections. From the interviews, both libraries update their digital collections monthly, as reflected in the responses below:

*Librarian 1:* “New resources are added to the digital collection every month.”

*Librarian 2:* “Digital collections are updated on a monthly and quarterly basis.”

### 4. Content of the Digital Library

The interviews with the librarians revealed that both libraries are members of the Consortium of Academic and Research Libraries in Ghana (CARLIGH) and, therefore, have subscriptions to over 30 academic databases, including JSTOR, Taylor & Francis, Sage Journals, EBSCO, Emerald, PubMed, and IEEE Xplore, among others.

In addition to the subscriptions accessed through CARLIGH, Library One has an institutional repository (IR) and other relevant materials available on Google Drive. The responses are as follows:

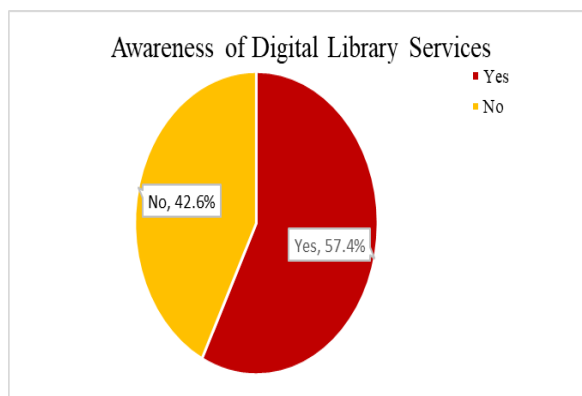
*Librarian 1:* “We have subscription databases and other materials on Google Drive in addition to our IR.”

*Librarian 2:* “There are subscription databases.”

### E. Awareness of Digital Library Services and Types of Digital Library Services Available

The researcher probed student respondents to determine their level of awareness of digital libraries or products in their respective university libraries.

From Figure 1, 57.4% (179 students) were unaware of the availability of library services, while the remaining 42.6% (133 students) were aware of the digital library services or products in their respective university libraries.



Source: Field data 2023

Fig. 1 Awareness of digital library services

The researcher asked student respondents who indicated they were aware of digital library resources how they learned about the digital library services in their university libraries.

As shown in Table I, more than half of the 133 respondents who were aware of digital library services from both universities learned about the services during orientation, accounting for 69 respondents (51.9%). Twenty-eight respondents (21%) discovered the services through their research, while 36 respondents (27.1%) were informed by a friend or colleague.

TABLE I HOW RESPONDENTS FOUND OUT ABOUT THE DIGITAL LIBRARY SERVICES

Variable	VVU		PU		Total	
	Freq	%	Freq	%	Freq	%
Orientation	27	20.3	42	31.6	69	51.9
Own Research	22	16.5	6	4.5	28	21
Told by a friend or colleague	18	13.55	18	13.55	36	27.1
Total	67	50.35	66	49.65	133	100

Source: Field data 2023

Student respondents were asked to indicate their knowledge level of digital library services. Table II provides information on the respondents’ level of knowledge regarding digital library services available in their university. It is observed in

the table that 129 respondents (31.1%) are aware of online databases in the digital library, and 64 respondents (15.4%) know about e-journals and e-books.

The online catalog, reference services, remote access, and support services had the lowest count. However, 179 respondents (43.1%) indicated that they were unaware of these digital library services in their university library.

#### F. Assessment of Digital Library Content

Library staff who participated in the interviews were asked to provide an overview of the electronic resources accessible through their digital library. The responses indicated differing levels of digital library development.

TABLE II KNOWLEDGE OF DIGITAL LIBRARY SERVICES

Digital Library Services	Responses	
	Freq.	Percent
Reference Services	7	1.7%
Online Database	129	31.1%
E-Journals and E-Books	64	15.4%
Online Catalogue	27	6.5%
Remote access and Support Services	6	1.4%
No Idea	182	43.9%

Source: Field data 2023

One librarian noted their library lacked a well-structured digital library service, while the other library provided details about the resources accessible through their digital library. The narrations are as follows:

*Librarian 1:* “We cannot boast of a robust and well-structured digital library currently, but we can confidently talk about the electronic databases that we subscribe to through The Consortium of Academic and Research Libraries in Ghana (CARLIGH).

Most of these databases are multidisciplinary, and the institutional repository is still accessible via the intranet (which is not live yet because it is still at the development stage). The library has also created a collection of eBooks in the library’s Google Drive portal that covers all our programs.”

*Librarian 2:* “Our digital library curates repositories of open-access materials, including research articles, theses, dissertations, and other scholarly content that are freely accessible to users. The library also often provides access to a wide range of electronic journals across various disciplines. These journals may include research articles, reviews, and scholarly content from reputable publishers. These are all accessible to students and other library users on and off-campus.”

Student respondents were asked to rate the comprehensiveness of the digital library collection in their areas of study. Table IV shows that 19 respondents (6.1%) rated the comprehensiveness of the digital library’s collection as excellent, 99 respondents (31.7%) rated it as good, and 194 respondents (62.2%) rated it as average.

TABLE III COMPREHENSIVENESS OF DIGITAL LIBRARY COLLECTION

Variable	VVU		PU		Total	
	Freq	%	Freq	%	Freq	%
Excellent	4	1.3	15	4.8	19	6.1
Good	52	16.7	47	15	99	31.7
Average	163	52.2	31	10	194	62.2
Total	219	70.2	93	29.8	312	100

Source: Field data 2023

#### G. User Satisfaction

Student respondents were asked to indicate their satisfaction with the resources available in the digital library. As shown in Table III, out of 312 respondents, 20 (6.4%) indicated they were *very satisfied* with the digital library resources available, 93 (29.8%) were *satisfied*, and 199 (63.8%) were *undecided*.

TABLE IV SATISFACTION WITH THE DIGITAL LIBRARY RESOURCES

Variable	VVU		PU		Total	
	Freq	%	Freq	%	Freq	%
Very Satisfied	4	1.3	16	5.1	20	6.4
Satisfied	49	15.7	44	14.1	93	29.8
Neutral	166	53.2	33	10.6	199	63.8
Total	219	70.2	93	29.8	312	100

Source: Field data 2023

The quantitative data on the level of user satisfaction was corroborated by the interviews. It was discovered from the interviews that one library had a lower level of user satisfaction due to the low rate of use of digital library resources, while the other library had a higher level of user satisfaction attributed to improvements in service provision. The narrations are provided below:

*Librarian 1:* “I would rate our users’ satisfaction below average. This is a result of the low patronage of digital library resources.”

*Librarian 2:* “User satisfaction can be rated as high; this is because the library actively listens to users’ feedback and continuously improves services to address their needs, which has increased the usage of digital library services in our library.”

#### H. How the effectiveness of the online catalogue is measured

In determining the effectiveness of the online catalogues in providing accurate information about available digital resources, it was discovered from the interviews that one library does not yet have its online catalogue accessible to users. On the other hand, the other library uses feedback from users and usage analytics to assess the effectiveness of its online catalogue. Comments provided are as follows:



*Librarian 1:* “The online catalogue is still not accessible to students and faculty yet because it is at the development stage, and we do not have a very robust and structured system in place. As a result, I cannot evaluate the effectiveness of the online catalogue in providing accurate information.”

*Librarian 2:* “The evaluation is done through feedback collected from library users via surveys or feedback forms to gauge their satisfaction with the online catalogues. We also monitor search logs and catalogue usage analytics to identify patterns in user behavior, popular search terms, and the success rate of search queries.”

*I. Strategies for Enhancing Digital Library Service Provision*  
*1. Promotion of the Use of Digital Library Services*

The researchers inquired from the interviewees about the strategies they have employed to promote the use of digital library services among students. It was discovered from the interviews that one library did not have promotional strategies in place, while the other library utilized its website, orientation sessions, workshops, and training programs to promote its digital library services. The narrations are provided below:

*Librarian 1:* “We intend to display banners around to promote the use of electronic databases. We will also send the URL of the Google Drive collection to all students and faculty on all social media platforms.”

*Librarian 2:* “The library’s website prominently features information about digital resources, making it easy for users to access and discover them. We also conduct orientation sessions for new students and faculty members to introduce them to the digital library’s resources, services, and how to navigate the online catalogue. Additionally, we organize workshops and training sessions to teach users how to effectively search, access, and utilize digital resources, databases, and research tools.”

*2. Frequency of Training of Library Staff on Managing and Expanding the Digital Library Collection*

The researchers inquired from respondents about the frequency with which staff receive training on managing and expanding the digital library collection. Both librarians stated that staff training is conducted annually.

*3. Measures to Provide Online Help and Support for Users*

Responses from the librarians interviewed regarding measures put in place to provide online help and support for

digital library users indicated differing approaches. One library relied on one-on-one, in-person assistance for users, while the other library employed FAQs and email services to provide help and support. The narrations are as follows:

*Librarian 1:* The university has provided internet access, enabling access to electronic databases on campus. We also provide one-on-one assistance to patrons, among other services.

*Librarian 2:* We have developed a comprehensive FAQ section on the library website that addresses common queries, technical issues, and how-to guides related to digital resources. We also offer an email support service where users can send inquiries or issues they are facing with digital resources, and librarians respond with guidance.

*4. Availability of Remote Access to Digital Resources*

With regard to the availability of remote access to electronic resources, responses from the librarians indicated that Library One provides remote access services, while Library Two does not provide remote access to its databases. The researcher further probed respondents to determine how they ensure the availability of remote access to digital library resources for their users.

Librarian One did not respond, as there are no remote access services available for the digital library. However, Librarian Two stated that they offer Virtual Private Network (VPN) services to enable remote access, as reflected in the following narration:

*Librarian 2:* We offer VPN services that allow authorized users to securely access the library’s digital resources as if they are on campus.

*J. Challenges*  
*1. Training and Support*

The lack of assistance with accessing digital libraries and inadequate training on how to use them were identified as significant challenges in the study. Table IV shows that 264 (84.7%) of respondents agreed that these factors affect access to and usage of digital libraries. Meanwhile, 48 (15.3%) and 43 (13.8%) of respondents disagreed that inadequate training on how to access and use the digital library affects access and usage, respectively. Additionally, 5 (1.6%) of respondents were undecided about whether inadequate training on how to access and use the digital library impacts their ability to utilize the library effectively.

TABLE V TRAINING AND SUPPORT

Variable	Freq / %	SA	A	N	D	SD	Total
Lack of assistance with access to digital libraries	Frequency	22	242		46	2	312
	Percent	7.1	77.6		14.7	0.6	100
Inadequate training on access and use of the digital library	Frequency	22	242	5	37	6	312
	Percent	7.1	77.5	1.6	11.9	1.9	100

Source: Field data 2023



## 2. Content and Awareness

The unavailability of relevant resources and lack of awareness are factors addressed in this section. It was observed that only 91 (32.7%) of respondents agreed with the assertion that a lack of resources was a challenge or limitation of using the digital library. A greater percentage,

189 (60.6%), remained neutral on this factor, while 19 (6.7%) disagreed that there were inadequate relevant resources in the digital library. Additionally, a significant majority, 274 (87.8%), agreed that there was a lack of awareness about the digital library and its services, whereas 35 (11.2%) disagreed. These findings are presented in Table V.

TABLE VI CONTENT AND AWARENESS

Variable	Freq / %	SA	A	N	D	Total
Un-availability of relevant resources.	Frequency	25	77	189	21	312
	Percent	8.0	24.7	60.6	6.7	100
Lack of awareness on Digital Libraries and services	Frequency	25	249	3	35	312
	Percent	8.0	79.8	1.0	11.2	100

Source: Field data 2023

## V. DISCUSSION OF THE STUDY

### A. Extent of Digital Library Provision

Electronic services and resources have become a major component of libraries, with their use or non-use determining the library's impact on the community, particularly in academic environments. Libraries worldwide are making efforts to ensure maximum utilization of their electronic initiatives. This has led to numerous research studies aimed at identifying the extent of awareness and use of electronic services and products within the library community. The findings of this research highlighted the existence of electronic services in the two libraries studied, demonstrating their efforts to expand their resource base to serve their user communities. This aligns with the assertions of Rafiq and Ameen (2018) and Skøtt (2021), who stated that many libraries have incorporated digital library services, extending access to varied collections of digital information to users in different geographical regions.

However, it was discovered that the range of electronic services provided is not as comprehensive as the offerings described by Sonker and Mahawar (2017) and Bera (2016). One of the libraries lacks an electronic catalog and does not provide remote access to its electronic collections. This situation portrays a static library, requiring users to be physically present and dependent on library staff for access to its content. Consequently, the library is not fully leveraging the benefits of electronic resources. Remote access, as highlighted by Begum and Elahi (2022), is one of the major advantages of digital library services, offering convenience and flexibility in accessing information. While the current situation indicates some progress in adopting electronic services, it also underscores the need for significant improvement to enhance the provision of electronic services and maximize their benefits for users.

### B. Management of Electronic Services

It was discovered that the two libraries studied employed different management styles for handling their electronic

resource units. While one library had a dedicated unit responsible for managing e-resources, the other library lacked such a unit for overseeing its electronic services. However, both librarians indicated that the content of their digital libraries is regularly updated.

The libraries were noted to provide varying levels of support to help users access and utilize their digital library services. These support mechanisms included in-person assistance, virtual support through email, and frequently asked questions (FAQs). Despite these efforts, only one of the libraries demonstrated notable steps to ensure the seamless availability of electronic services. However, innovative practices, as recommended by Xiao (2022), were not significantly identified in one of the libraries, highlighting a gap in the adoption of forward-thinking strategies for enhancing electronic service provision.

### C. Awareness of Electronic Services

The study identified a significant lack of awareness among respondents regarding digital library services, with 57.4% being unaware of their existence. This underscores potential gaps in communication or promotional strategies, highlighting the need to integrate information literacy education into university curricula to enhance awareness of available library resources. This aligns with the recommendations of Anyim (2018) and Tom-George and Onyema (2020), who advocated for libraries to organize seminars, training courses, and user assistance systems to improve users' awareness of digital resources, digital competency, and literacy skills. Orientation emerged as a crucial means through which respondents became acquainted with digital library services, emphasizing the pivotal role of library orientation in shaping students' awareness and understanding of available resources. This corroborates the findings of Iwhiwhu and Eyekpegaha (2009), Khan and Bhatti (2017), and Owusu-Ansah (2021), who asserted that implementing a digital library requires user training and support to ensure effective navigation and utilization of digital resources. Institutions should consider integrating digital literacy and library orientation programs into their

curricula to equip students with the necessary skills to effectively navigate digital libraries.

Interviews with participating librarians revealed variations in the accessibility of online journals and databases. Pentecost University (PU) had measures in place to ensure continued access to these resources, whereas Valley View University (VVU) lacked a feasible plan for sustained accessibility. Libraries must implement strategies to ensure the availability and accessibility of resources to users, thereby enhancing user satisfaction.

This finding aligns with Aviamu *et al.*, (2019), who observed that increased accessibility facilitates research, learning, and knowledge dissemination. Despite these efforts, a significant proportion of respondents (63.8%) remained undecided about their satisfaction with digital library resources, indicating a need for further enhancements to meet user expectations. This underscores the importance of continuously improving digital library services to align with user needs and preferences. Tabassuma *et al.*, (2015) noted that the use of electronic resources increases when users perceive the content as relevant and of high quality.

Regarding the comprehensiveness of digital library collections, the majority of respondents (62.2%) perceived the collection as average, suggesting room for improvement. Libraries should strive to enhance the content of their collections to cater to the diverse needs of students across different disciplines. This finding aligns with previous studies by Skøtt (2021) and Sreenivasulu (2015), which indicated that users are more likely to adopt digital library services when they perceive a wide range of relevant and high-quality digital materials available. By curating a comprehensive collection, libraries can better support teaching, learning, and research activities, ultimately enhancing the overall user experience.

#### *D. Challenges and Limitations in Accessing and Using the Digital Library Services*

##### *1. Training and Support*

Insufficient training and support emerged as the primary challenge hindering access to and utilization of digital libraries. This finding aligns with previous research by Anyim (2018) and Tom-George and Onyema (2020), which emphasizes the critical role of user training and support services in facilitating the adoption of digital library services.

The need for skilled personnel and ongoing training is further underscored by Aviamu *et al.*, (2019), and Tabassuma *et al.*, (2015), who highlight that creating accurate and consistent metadata for each resource, as well as ensuring proper classification and subject indexing, requires skilled librarians and metadata specialists. Additionally, Aviamu *et al.*, (2019) stress the importance of equipping users with the necessary skills and assistance to navigate digital resources effectively.

##### *2. Unavailability of Relevant Resources and Lack of Awareness*

The findings indicate that a lack of awareness and the unavailability of relevant resources contribute to the low patronage of digital library services. This finding contradicts previous research by Sharma (2018) and Witten *et al.*, (2003), which highlight the role of digital libraries in creating unique identities, benefiting user communities, and advancing institutional goals.

Khan and Bhatti (2017) emphasize the importance of content selection criteria, including relevance, quality, and suitability for the intended audience. Borgman *et al.*, (2015) underscore the significance of considering user needs and preferences in the selection process. Serwaa *et al.*, (2021) opined that these collections are carefully curated and selected based on their relevance, academic value, and user needs (Serwaa *et al.*, 2022).

Digital library service providers must incorporate promotional activities to increase awareness and knowledge of available services and resources. By carefully curating collections and facilitating their use, digital libraries can create unique identities and support user communities, ultimately increasing usage and fulfilling institutional goals (Sharma, 2018; Witten *et al.*, 2003).

## **VI. CONCLUSION**

Digital libraries have become essential tools that are transforming the way knowledge is accessed and shared. As the information era evolves, these digital resource repositories are vital for enabling universal access to a multitude of scholarly materials, including multimedia content and academic publications. Digital libraries are dynamic spaces that incorporate cutting-edge technologies, positioned at the intersection of technical advancements, evolving academic research, and user expectations. In conclusion, this study sheds light on the current state of digital library provision, highlighting areas for improvement, such as increasing awareness, enhancing accessibility, and improving user support. By addressing these challenges and leveraging the benefits of digital library services, institutions can better meet the information needs of their users and foster a culture of lifelong learning.

## **VII. RECOMMENDATION OF THE STUDY**

Digital libraries play a pivotal role in transforming information access and dissemination in academic institutions as well as the general contemporary society. Their importance lies in providing a platform for convenient, efficient, and widespread access to a vast array of digital resources. To recognize the apparent significance of digital libraries in academic success, library management should prioritize investments in digital infrastructure to ensure seamless accessibility and comprehensive resource coverage. The library management and institutional leadership should

allocate adequate funds to infrastructure and other resources such as skilled personnel to ensure a continuous operation of the digital library. The management of the institution and the library management can seek support from alumni of their institutions as well as collaborate with external organizations or seek grant opportunities to alleviate financial constraints.

Metadata management in digital libraries serves a crucial function in enhancing the organization, discovery, and retrieval of digital resources. The library needs to have library staff who are skilled in organizing data as well as managing metadata to ensure the easy access and use of resources by the users. As such, it is recommended that the library management and human resource management units of the institution should invest in recruiting skilled librarians with expertise in digital library and metadata management. Regular training programs can also be instituted to keep library staff updated on best practices in metadata creation and management. The libraries should endeavour to improve on educating their user communities on the available electronic resource and offer skill training to the users in order to increase the use of the electronic resources. Librarians, in collaboration with academic faculty, can organize orientation sessions educating and training users on how to navigate and use electronic resources to meet their information needs. They can also organise workshops to familiarize students with the features and benefits of digital libraries.

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