



Enhancing Access to Digital Collections through University Library Websites: an evaluation study

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Abstract:

University library websites in Algeria serve not only as information systems but also as digital communication platforms that connect academic institutions with students and researchers. However, they face challenges in providing effective and user-centered access to digital collections. This study aims to evaluate 15 Algerian university library websites in terms of providing access to digital collections. Using a checklist based on usability and international accessibility standards, the evaluation focuses on navigation, search functionality, and access to digital resources. Findings reveal that most websites are well-organized and easy to navigate but lack multilingual support, advanced search features, and varied content formats such as e-books and multimedia. Additionally, essential services such as virtual assistants and interactive tools are largely absent, which limits online engagement and scholarly communication reducing academic visibility. Recommendations include enhancing accessibility, adding Web 2.0 functionalities, and expanding digital collections. Future work should incorporate automated accessibility testing tools such as the WAVE tool to address technical barriers on these platforms.

Keywords: Digital Collections; University Library Websites; Accessibility; Usability; Digital Communication; Evaluation Study



1. INTRODUCTION

The digital age has brought about significant changes in the practices of universities and libraries. Academic institutions have integrated resources and materials into their collections, allowing users to explore a wide array of materials online. As a result, university libraries have introduced websites featuring databases, digitized manuscripts, journal articles, and multimedia collections to offer convenient access to these digital collections. Furthermore, these websites serve as the main gateway for students and researchers to access academic resources and information services anytime and anywhere. Beyond their informational function, these platforms also act as institutional communication tools that shape how universities present their academic identity, manage their reputation, and build engagement with their audiences in the digital space (McQuail, 2010) .

Evaluating library websites is crucial to ensure access to digital collections, specifically regarding the design, organization, and distribution of collections, search options, effective links, metadata, indexing functionalities, and other elements that affect information retrieval. As Nielsen pointed out, usability and user-centered design are key to making digital platforms effective and accessible for users (Nielsen, 1993). From a communication perspective, usability and user experience also influence how audiences perceive the credibility and reliability of the institution. A well-designed website therefore not only facilitates access to resources but also contributes to audience trust and sustained interaction, in line with studies showing that institutional communication via digital and social media channels plays a central role in audience engagement and trust building (Capriotti & Zeler, 2023).

Despite the critical importance of digital collections and their accessibility, many university libraries, particularly in Algeria, still face significant challenges in creating websites that meet established standards and best practices. Many library websites are created without following international and web design frameworks, such as the standards outlined by IFLA, which provide guidelines for e-resource collection development and accessibility (Johnson, et al., 2012). This issue can affect user experiences, restrict access for individuals with disabilities, and reduce discoverability of valuable digital collections. In addition, the absence of standardization not only undermines the effective use of digital collections but also creates barriers to knowledge dissemination and academic research. This study aims to evaluate the current state of Algerian university library websites and promote the adoption of web standards to enhance access to digital collections in academic libraries across the country.



1.1 Research questions:

Based on the issues highlighted, our study aims to answer these questions:

1. How effectively do Algerian university library websites currently provide access to their digital collections?
2. To what extent do the selected websites meet international standards for accessibility and usability in the digital collections?
3. What are the challenges and barriers to accessing digital collections through these websites?

1.2 Objectives of the study:

The study aims to:

- Assess the current state of digital collection access through the selected university library websites.
- Identify common strengths and weaknesses in the design and functionality of these websites to access to the digital collections.
- Compare the digital collection access features across different Algerian university libraries, highlighting innovative approaches and areas for improvement.

2. LITERATURE REVIEW:

2.1 Previous studies:

The first study by Fatiha Merazka, Sabrina Megnani (2019) conducted an exploratory study aiming to shed light on the organization of digital content in Algerian university libraries, specifically at the Emir Abdelkader University of Islamic Sciences in Constantine. The study focused on understanding the impact of effective organization and availability of this university's digital content for the user community, using a case study approach, involving librarians and technical staff responsible for managing the digital content of the library. The key findings indicate that ensuring effective access to digital content in university libraries is contingent on the rigorous organization and management of that content by qualified and trained librarians.

The second study by Ebele N. Anyaoku and Lucky Oji Akpojotor (2020) aimed to evaluate the usability of 11 university library websites in south of Nigeria. Using five usability attributes namely: usefulness, efficiency, effectiveness, learnability, and accessibility. The researchers used an analytical survey and a usability checklist to collect and analyze data. The study found that while some websites performed well on certain attributes, many lacked important features like search



tools, site maps, and interactive elements that would enhance the users' experience. The authors concluded that regular evaluation of library websites is crucial to support users' academic and professional needs.

The third study conducted by Fath Eddine Bahi (2022) examined the websites of Algerian university libraries using a set of criteria, including accuracy, currency, objectivity, coverage, and purpose. It also looked at specific features such as the availability of full-text access to theses and dissertations, online library catalogs, and multimedia content. The researchers referenced evaluation frameworks developed by organizations like the Association of College & Research Libraries (ACRL) to guide their assessment. Overall, the article provided a comprehensive evaluation of the state of Algerian university library websites to explore areas of development and change since that time.

The fourth study by Madhu S (2023) conducted a content analysis of library websites/webpages of nine institutes of national importance in Karnataka, India. The researchers developed a standard checklist based on previous literature to analyze the content of these websites. The study examined aspects such as the availability of dedicated library websites, accessibility of the library link from the institution's homepage, general library information, information on physical and digital collections, library services, research support tools, value-added services, open-source resources, implementation of Web 2.0 features, contact information, and site aids/tools present on the websites. The analysis revealed varying levels of content richness across the evaluated websites, highlighting areas for improvement in showcasing library resources and services effectively through the online medium.

❖ Previous studies have offered valuable background by examining usability, content organization, and technical aspects of library websites across different contexts. While researchers have discussed various aspects of library websites in different countries, no study has offered a comprehensive evaluation that combines usability, accessibility, search functionality, and digital collection accessibility in the Algerian context. Externally, Anyaoku and Akpojotor studied usability factors in Nigerian university libraries but did not explore how these elements affect access to digital resources. Madhu S. examined library websites in India, focusing on content availability rather than how users interact with these platforms to find academic resources.

In Algeria specifically, Merazka F. and Megnani S. analyzed digital content organization without addressing website usability or accessibility from the user's perspective. Similarly, Bahi F. evaluated Algerian university library websites using technical criteria but did not assess their effectiveness in supporting access to digital collections.



This research addresses the gap by systematically evaluating selected Algerian university library websites, focusing on navigation design, search functionality, accessibility compliance, and mobile

responsiveness. By assessing these factors, the study provides valuable insights into how effectively these platforms support access to digital collections. As academic libraries increasingly serve as gateways to digital resources rather than merely physical repositories, understanding the effectiveness of these digital interfaces is essential for improving educational outcomes and strengthening research capabilities within Algerian higher education institutions.

2.2 Definition of digital collections in university libraries:

Digital collections are curated sets of electronic resources that have been selected, organized, and made accessible by libraries to support institutional goals such as teaching, scientific research, and preservation. These may include both born-digital and digitized content (ACRL, 2017), such as theses, books, journals, multimedia, datasets, and institutional publications, all structured and described to serve users through digital platforms: library websites and repositories.

2.3 Models and Standards for Evaluating Library Websites:

In evaluating academic library websites, especially in the context of digital collection access, it is essential to rely on recognized international standards and models that ensure inclusivity, functionality, and service quality.

2.3.1 Web Content Accessibility Guidelines (WCAG 2.1):

The WCAG2.1 was developed by the World Wide Web Consortium (W3C) and published in 2018 (W3C, n.d.); It serves as a global benchmark for web accessibility. In addition, it ensures that library websites are accessible to all users, especially those with disabilities, and meet legal or institutional accessibility requirements in many countries. The evaluation considers four key principles commonly known by the acronym POUR: (WCAG 2.1, 2018)

- **Perceivable**, which ensures content is accessible to all users through features such as alternative text for images, adequate contrast ratios, and multilingual support.
- **Operable**, which verifies that websites can be navigated easily, including interactive elements and browser compatibility.
- **Understandable**, which assesses how well users can comprehend and navigate the website, including structured menus, clear instructions, and search tool usability.



- **Robust**, which checks website compatibility with assistive technologies, such as screen readers and mobile responsiveness.

2.3.2 ACRL Standards for libraries in higher education:

The Association of College and Research Libraries (ACRL) issued the Standards for Libraries in Higher Education in 2018. Its standards are broad, and they include critical benchmarks relevant to library website development, especially for digital collection access. It includes: (ACRL, 2018)

- **Access to Information:** Libraries must ensure that digital resources, including institutional repositories and licensed e-collections, are readily accessible via their websites. This includes 24/7 access, authentication systems, and remote login support.
- **User Experience and Assessment:** This indicator emphasizes usability, discoverability, and user satisfaction. Libraries are encouraged to evaluate the user-friendliness of their platforms and incorporate feedback mechanisms to support continuous improvement.
- **Technological Infrastructure:** The digital platforms must align with current technology standards, support scalable growth, and integrate effectively with learning management systems and discovery tools.
- **Inclusivity and Equity:** Libraries must ensure equitable access to all users, including individuals with disabilities, through adherence to accessibility principles as exemplified by the WCAG 2.1 standards.

The ACRL framework reinforces the idea that a library website is not merely a communication tool however, it is a strategic service platform that supports teaching, learning, and research.

2.3.3 IFLA Guidelines on e-resources and digital access:

The International Federation of Library Associations and Institutions (IFLA) provides relevant guidance for digital library environments through its document: *Key Issues for E-Resource Collection Development (2012)*. While primarily focused on digital collection management, the guidelines also include recommendations relevant to library website functionality, outlining several technical and user-centered factors applicable to library portals:

- **Technical functionality:** IFLA underscores the need for stable platforms that support multiple content types (texts, images, records, videos...), integrated search tools, and responsive design for various devices.



- **User training and help services:** The availability of tutorials, FAQs, and helpdesk services via library websites is essential to enable effective use of digital collections, especially for new or off-campus users.
- **Metadata and discovery:** Accurate and comprehensive metadata allows users to find and retrieve digital collections efficiently. Website interfaces must support browsing, filtering, and federated search options.
- **Licensing and access control:** The guidelines highlight the importance of ensuring secure and equitable access to licensed resources, often through IP authentication, proxy servers, or federated login systems.
- **Sustainability and long-term access:** The library's digital infrastructure must include archiving policies and systems to ensure the preservation of digital collections over time.

IFLA's recommendations provide a strategic and operational framework for evaluating whether library websites are fulfilling their role in supporting scholarly communication through digital resources.

2.4 Library Websites as Communication Tools in Higher Education:

University library websites are not only gateways to digital collections but also strategic communication platforms within the academic institution. They mediate the relationship between libraries and their audiences by shaping how students, researchers, and the broader academic community perceive the institution. From a communication studies perspective, these websites play a role in three interrelated dimensions:

First, they serve as ***digital communication channels***, where accessibility, navigation, and design influence how information is delivered and received. A clear and user-centered interface aligns with principles of digital communication and enhances the credibility of the institution. Moreover, interactivity defined across human-to-human, human-to-document, and human-to-system dimensions is considered a central characteristic of new media platforms (McMillan, 2010). University library websites, therefore, are not only repositories of information but also interactive environments that shape user engagement and trust.

Second, library websites contribute to ***reputation management***. A functional, transparent, and regularly updated website reflects the institution's commitment to openness, reliability, and innovation, reinforcing trust among users. Inadequate usability, by contrast, may harm the library's image and weaken its academic visibility.

Third, websites act as ***audience-building tools***, since they not only provide resources but also create spaces for interaction through features such as social media integration, feedback channels,



and personalized services. In this way, the website becomes an arena for fostering engagement, strengthening the academic community, and supporting knowledge dissemination. Global studies highlight this dimension: Jabeen and Ganai (2018) found that Web 2.0 applications such as Facebook, Twitter, and YouTube are widely adopted in academic libraries worldwide, facilitating communication, information sharing, and collaboration with users. Their findings underline that social networking tools serve as dynamic platforms for engagement, reinforcing the communicative and educational mission of university libraries.

Taken together, these dimensions suggest that positioning university library websites as communication tools highlights their dual function, they are both technical infrastructures for accessing digital resources and communicative interfaces that influence user experience, institutional reputation, and the effectiveness of higher education in the digital age

3. METHODOLOGY:

3.1 Evaluation approach: This study examines 15 Algerian university libraries, specifically central libraries, selected through a purposive sample to represent the country's diverse higher education landscape. The sample includes libraries from all four major regions of Algeria (North, South, East, and West) to provide a comprehensive assessment of digital collection access.

Table1. Selected Algerian University Libraries for Website Evaluation

Number	Library's Name	URL
01	Central Library of the University of Ben Youssef Ben Khedda Algiers 1	http://bu.univ-alger.dz/
02	Central Library of the University of Houari Boumediène Algiers	https://bu.usthb.dz/
03	Central Library of the University of Bouira	https://www.univ-bouira.dz/bu/
04	Central Library of the University of Abd Errahmane mira Bejaia	http://recherche.univ-bejaia.dz/index.php
05	Central Library of the University of Abi Bakr Belkaid Batna	https://bibliotheque.univ-batna2.dz/
06	Central Library of the University of Ahmed Ben Bella Oran 1	https://buc.univ-oran1.dz/



07	Central Library of the University Hamma Lakhder El Oued	https://biblio.univ-eloued.dz/
08	Central Library of the University of Tamanrasset	https://bu.univ-tam.dz/
09	Central Library of the University of Badji Mokhtar Annaba	https://biblio.univ-annaba.dz/
10	Central Library of the University of Ferhat Abbas Setif1	https://biblio.univ-setif.dz/
11	Central Library of the University Ghardaia	https://bu.univ-ghardaia.edu.dz/
12	Central Library of the University of 20 august1955 Skikda	http://bibliotheque.univ-skikda.dz/index.php/ar/
13	Central Library of the University of Mouloud Maameri Tizi Ouzzou	https://www.ummto.dz/bibliotheque/
14	Central Library of the University Abdelhamid Ibn Badis Mostaganem	https://www.univ-mosta.dz/library/
15	Central Library of the University el Arbi el Tebessi Tebessa	https://www.univ-tebessa.dz/bibliotheque/

Source: Prepared by the Researchers

3.2 Data collection method:

This study employs a structured evaluation checklist adapted from Iqbal et al.'s (2022) study which was developed through controlled experiments and tested against the Academic Library Website Evaluation Checklist to assess its effectiveness and efficiency. The checklist evaluates the usability of Web-Based Library Systems (WBLS) by incorporating both general usability aspects, such as navigation, content organization, and interface design, and library-specific aspects, including smart searching, access to e-resources, and digital collection availability. In addition, to ensure a comprehensive assessment of accessibility, this study also aligns its evaluation criteria with the WCAG 2.1.

The evaluation process combines quantitative scoring through a binary system: ✓ for compliance and ✗ for non-compliance, and qualitative observations to identify additional insights.

4. RESULTS AND ANALYSIS:



The results of the evaluation study are presented in the following tables, offering a comprehensive overview of the findings.

Table 2. Evaluation of University Library Digital Interfaces

Aspects libraries	Aesthetic : interface design (attractiveness)	Aesthetic: Identifiabl e links (colour /underline)	Navigation: easy navigation/ browser compatibility	Navigation : home page link on every page	Navigation : multiple languages	Interaction: contact us link provided
Ben Youssef Ben Khedda Algiers 1	✓	✓	✓	✓	✗	✓
Houari Boumediène Algiers	✓	✓	✓	✓	✗	✓
Bouira	✓	✓	✓	✓	✓	✓
Abd Errahmane Mira Bejaia	✓	✓	✓	✓	✗	✓
Abi Bakr Belkaid Batna	✓	✓	✓	✓	✗	✓
Ahmed Ben Bella Oran 1	✓	✓	✓	✓	✓	✓
Hamma Lakhder El Oued	✓	✓	✓	✓	✗	✗
Tamanrasset	✓	✓	✓	✓	✗	✗
Badji Mokhtar Annaba	✓	✓	✓	✗	✗	✓
Ferhat Abbas Setif1	✓	✓	✓	✓	✗	✗
Ghardaia	✓	✓	✓	✗	✓	✓
20 august1955 Skikda	✓	✓	✓	✓	✓	✓
Mouloud Maameri Tizi Ouzzou	✓	✓	✓	✓	✓	✓
Abdelhamid Ibn Badis Mostaganem	✓	✓	✓	✓	✗	✗
El Arbi el Tebessi Tebessa	✓	✓	✓	✓	✓	✓
Total	100%	100%	100%	86.67%	40%	73.33%

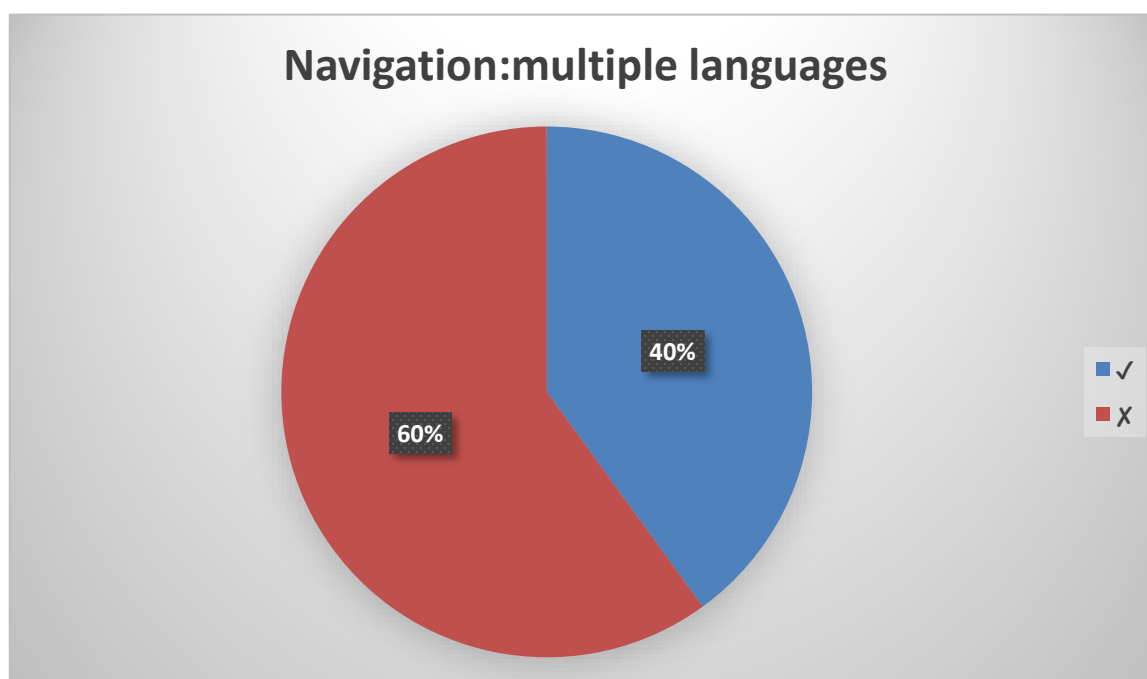
Source: Prepared by the Researchers

Table 2 presents the evaluation of the selected university library digital interfaces. The analysis covers 15 central libraries, examining six key criteria related to aesthetics, navigation, and interaction. Results indicate uniformly strong performance in aesthetic aspects, with all libraries



(100%) achieving positive marks for both interface design attractiveness and identifiable links. This suggests a concerted effort across libraries to create visually appealing and user-friendly websites. For example, the libraries of the University of Bouira and Ahmed Ben Bella University Oran 1 both display clean, modern layouts with clearly identifiable hyperlinks, enhancing the overall visual experience. Navigation capabilities show mixed results. While all libraries (100%) demonstrate easy navigation and browser compatibility, there is a notable drop in the provision of homepage links on every page (86.66%), such as the Central Library of Badji Mokhtar University Annaba and the University of Ghardaïa. This minor inconsistency could potentially impact user experience, especially for those less familiar with web navigation.

figure 1. Implementation of multiple languages in Navigation



source: prepared by the researchers

The most significant variation appears in the implementation of multiple languages, with only 40% of libraries offering this feature. Given Algeria's linguistic diversity, with Arabic and French being widely used, this low percentage represents a potential area for improvement to enhance accessibility and inclusivity. These findings align with Bahi's (2022) study, which emphasized the need for better multilingual support to improve user access to Algerian academic library websites.

Interaction capabilities, specifically the provision of contact links, are present in 73.33% of the examined websites. While this is a majority, it still leaves room for enhancement in facilitating user-library communication, including the libraries of Setif and Mostaganem.



In conclusion, several libraries stand out for meeting all criteria, including those of the University of Bouira, Ahmed Ben Bella Oran 1 and 20 August 1955 Skikda. These could serve as benchmarks for other institutions aiming to improve their online presence.

Table 3. Digital collections and E-resources availability assessment

Aspects Libraires	e-journal articles availability	e-books availability	Thesis availability	Conference papers	Multimedia resources	Institutional repository provided (dspace ..)	Bibliographic Databases links (SndI, Pnst...)
Ben Youssef Ben Khedda Algiers 1	Full text	Full text	Full text	Full text	NF	✓	✓
Houari Boumediène Algiers	Bib. data	Bib. Data	Full text	Bib. data	NF	✓	✓
Bouira	Full text	Bib. data	Full text	Full text	NF	✓	✓
Abd Errahmane Mira Bejaia	Bib. Data	Bib. Data	Full text	Bib. data	NF	✓	✓
Abi Bakr Belkaid Batna	Full text	Bib. data	Full text	Full text	NF	✓	✓
Ahmed Ben Bella Oran 1	NF	Bib. data	Full text	NF	NF	✓	✓
Hamma Lakhder El Oued	Full text	Bib. data	Full text	Full text	NF	✓	X
Tamanrasset	NF	NF	NF	NF	✓	NF	✓
Badji Mokhtar Annaba	Full text	Bib. Data	Full text	Bib. data	NF	✓	✓
Ferhat Abbas Setif1	Full text	Bib. Data	Bib. Data	NF	NF	✓	✓



Ghardaia	NF	Bib. data	NF	NF	NF	✓ps :Does n't work	✓
20 august1955 Skikda	Full text	Bib. Data	Full text	Bib. data	NF	✓	✓
Mouloud Maameri Tizi Ouzzou	Full text	Bib. Data	Full text	Bib. data	NF	✓	✓
Abdelhamid Ibn Badis Mostaganem	Full text	Bib. data	Full text	Full text	NF	✓	✓
El Arbi el Tebessi Tebessa	Full text	Bib. data	Full text	Full text	NF	✓	✓

Note: Bib. Data: bibliographic data .NF: Not Found source: prepared by the Researchers

The table presents a detailed overview of digital resources across the selected Algerian university libraries, highlighting notable strengths and gaps. In terms of e-journal articles, full-text access is available in 66.7% of the libraries, reflecting significant investment in electronic subscriptions. While e-books, although 13 libraries provide at least bibliographic data, only the Central Library of the University of Ben Youssef Ben Khedda Algiers 1 offers full-text access, indicating limited development in this area. Regarding thesis availability, the situation is notably stronger, with 12 libraries providing full-text versions, reflecting a clear institutional commitment to supporting research visibility. However, conference papers and especially multimedia resources remain underdeveloped, with the latter found in only one university (university of Tamanrasset). As for institutional repositories are widely established, often powered by the DSpace system, though technical issues exist, as seen with the University of Ghardaia, suggesting challenges in maintenance. Finally, bibliographic database links are almost universally provided, demonstrating strong efforts to connect users with national research platforms.

In conclusion, while there are areas of strength, particularly in the availability of thesis and institutional repositories, there is significant variability across resource types and institutions. Future efforts could focus on expanding full-text availability of e-journals and e-books, developing multimedia resources, and ensuring consistent access across all digital collection types. Additionally, investigating the factors behind the high-performing libraries such as Ben Youssef Ben Khedda Algiers 1 and Abdelhamid Ibn Badis Mostaganem could provide valuable insights for system-wide improvements. These findings align with Stephan's (2017) study, who emphasizes that effective management of electronic resources in academic libraries is essential to ensuring



equitable access, supporting research, and overcoming technical and licensing challenges (Stephen, 2017).

Table 4. Evaluation of electronic library services

Aspects Libraries	OPAC	Online account manage ment	Referenc e service: Ask a librarian	Online reservati on /renewal	Download ing/printin g e- resources	CAS	SDI	Online docu ment deliver y	Resource suggestion service	Useful links are provided
Ben Youssef Ben Khedda Algiers 1	✓	X	✓	✓	✓	X	✓	X	X	✓
Houari Boumediène Algiers	✓	X	X	✓	✓	✓	X	X	✓	✓
Bouira	✓	✓	X	X	✓	X	X	X	X	✓
Abd Errahmane Mira Bejaia	✓	✓	X	X	✓	X	X	X	✓	X
Abi Bakr Belkaid Batna	✓	X	X	X	✓	X	X	X	X	✓
Ahmed Ben Bella Oran 1	✓	X	X	X	✓	X	X	X	X	✓
Hamma Lakhder El Oued	✓	X	X	X	✓	X	X	X	X	X
Tamanrasset	✓	X	X	✓	X	✓	X	X	✓	✓
Badji Mokhtar Annaba	✓	✓	X	X	✓	✓	X	X	✓	✓
Ferhat Abbas Setif1	✓	✓	X	✓	✓	✓	X	X	✓	X



Ghardaia	✓	✓	X	X	✓	X	X	X	X	✓
20 august1955 Skikda	✓	X	X	X	✓	✓	X	X	X	✓
Mouloud Maameri Tizi Ouzzou	✓	✓	X	X	✓	✓	✓	X	✓	✓
Abdelhamid Ibn Badis Mostagane m	✓	✓	X	✓	✓	X	X	X	X	✓
El Arbi el Tebessi Tebessa	✓	X	X	X	✓	✓	X	X	✓	✓
Total	100%	46.67%	6.67%	33.33%	93.33%	46.6 7%	13.3 3%	00.00 %	46.67%	80%

Source: prepared by the researchers

Table 4 shows the availability of 10 electronic library services. It was found that the online public access catalog (OPAC) service achieved full implementation (100%), along with strong support for e-resource access (93.33%), with libraries such as the Central Library of Mouloud Maameri University of Tizi Ouzzou and Badji Mokhtar University of Annaba standing out. However, more advanced and user-centered services reveal major gaps: online account management is offered by less than half of the libraries (46.66%), and critical interactive services like "Ask a Librarian" (6.66%) are largely absent, even in major universities such as Algiers 1 and Oran 1. We have also noticed that no library currently provides online document delivery, limiting remote research support. Some positive efforts, such as the provision of useful links (80%) and current awareness services (CAS) with (46.66%), are observed but remain uneven. Selective Dissemination of Information (SDI), which provides personalized information updates based on individual user profiles, can be highly valuable for researchers (Ashikuzzaman, 2023). However, its adoption is very limited, as only (13.33%) of libraries offer this service.

Overall, while basic digital infrastructure exists, the data suggest an urgent need for Algerian university libraries to invest in personalized, proactive, and remote-access services to meet evolving academic demands.



Table 5. Evaluation of Accessibility and Search Features

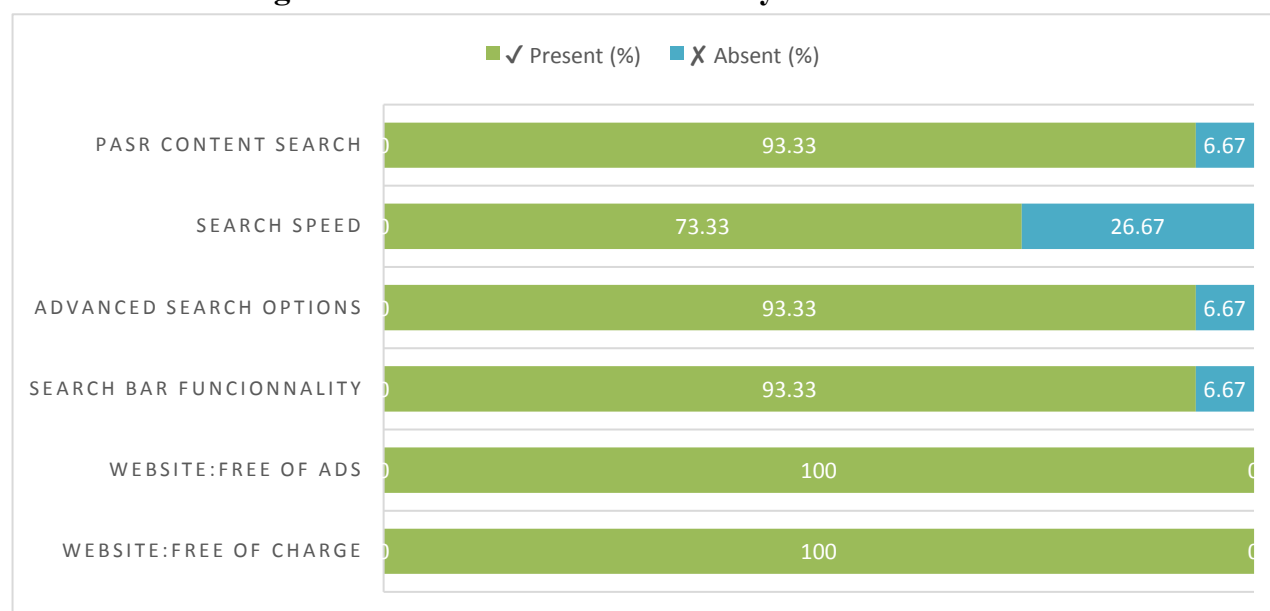
Aspects universities	Website: free of charge	Free of ads	Search bar functionality	Advanced search options	Search speed (quick response)	Past content search
Ben Youssef Ben Khedda Algiers 1	✓	✓	✓	✓	✓	✓
Houari Boumediène Algiers	✓	✓	✓	✓	✓	✓
Bouira	✓	✓	✓	✓	✗	✓
Abd Errahmane Mira Bejaia	✓	✓	✓	✓	✓	✓
Abi Bakr Belkaid Batna	✓	✓	✓	✓	✗	✓
Ahmed Ben Bella Oran 1	✓	✓	✓	✓	✓	✓
Hamma Lakhder El Oued	✓	✓	✓	✓	✓	✓
Tamanrasset	✓	✓	✗	✗	✗	✗
Badji Mokhtar Annaba	✓	✓	✓	✓	✓	✓
Ferhat Abbas Setif1	✓	✓	✓	✓	✓	✓
Ghardaia	✓	✓	✓	✓	✓	✓
20 august1955 Skikda	✓	✓	✓	✓	✓	✓
Mouloud Maameri Tizi Ouzou	✓	✓	✓	✓	✓	✓
Abdelhamid Ibn Badis Mostaganem	✓	✓	✓	✓	✓	✓



El Arbi el Tebessi Tebessa	✓	✓	✓	✓	✗	✓
total	100%	100%	93.33%	93.33%	73.33%	93.33%

Source: prepared by the researchers

Figure 2. Evaluation of Accessibility and Search Features



Source: prepared by the researchers

Table 5 evaluates digital access and search functionalities across the selected Algerian university libraries. To clarify these findings, Figure 2 presents a stacked bar chart illustrating the distribution of presence and absence for each assessed feature:

1. Website free of charge and Free of ads: All libraries provide websites that are free to access and free of advertisements; This demonstrates a commitment to open access and user-friendly interfaces across all institutions.

2. Search bar functionality: 14 out of 15 libraries offer a search bar, indicating that most have implemented basic search capabilities. However, Improvements are still needed, as the library of the University of Tamanrasset lacks this fundamental feature.

3. Advanced search options: 93.33% of libraries provide advanced search options, showing a strong focus on offering users more refined search capabilities. Again, the University of



Tamanrasset does not offer this feature, suggesting limitations in supporting complex information needs.

4. Search speed (quick response): 73.33% of libraries have quick search response times. While this is a majority, it suggests that about a quarter of the libraries may need to improve their search performance.

5. Past content search: 93.33% of libraries can search past content, indicating a robust archival search capability across most libraries. Again, this feature is absent in the University of Tamanrasset.

Overall, the findings highlight the University of Tamanrasset as having the least developed digital search infrastructure, lacking 4 / 6 aspects. Meanwhile, most libraries perform well across all categories, with 10 out of 15 libraries offering all 6 features. When viewed in a broader context, these results reflect positively on Algerian university libraries. For instance, Anyaoku and Akpojotor (2020) found that many university library websites in southern Nigeria lacked basic search tools and interactive features, making it difficult for users to access resources. In contrast, Algerian libraries show stronger digital services and a better focus on user needs.

Table 6. Web 2.0 Services

Universities \ Aspects	Social Media Integration (Facebook, Twitter...)	Blogs	RSS Feeds availability	FACs availability	Feedback forums	Mobile app availability
Ben Youssef Ben Khedda Algiers 1	✓	✓	✗	✓	✗	✗
Houari Boumediène Algiers	✓	✗	✗	✗	✗	✗
Bouira	✓	✗	✓	✗	✗	✗
Abd Errahmane Mira Bejaia	✗	✗	✓	✗	✗	✗
Abi Bakr Belkaid Batna	✓	✗	✗	✗	✗	✗
Ahmed Ben Bella Oran 1	✓	✗	✗	✓	✗	✗
Hamma Lakhder El Oued	✓	✗	✗	✗	✗	✗
Tamanrasset	✓	✗	✗	✗	✓	✓



Badji Mokhtar Annaba	X	X	X	X	X	X
Ferhat Abbas Setif1	✓	X	X	X	X	X
Ghardaia	✓	X	✓	X	X	X
20 august1955 Skikda	✓	X	X	X	X	X
Mouloud Maameri Tizi Ouzzou	✓	X	X	X	X	X
Abdelhamid Ibn Badis Mostaganem	X	X	✓	X	X	X
El Arbi el Tebessi Tebessa	✓	X	X	✓	X	X
total	80%	6.67%	26.67%	20%	6.67%	6.67%

Source: prepared by the researchers

Web 2.0 tools are social networking applications that can be used to communicate, provide services, and enhance the visibility of libraries among their users (Al-Qallaf & Ridha, 2019). In this context, Table 6 examines the adoption of Web 2.0 services among university libraries in Algeria, focusing on six aspects:

1. Social Media Integration: 80% of libraries have integrated social media platforms such as Facebook, Twitter, and Instagram. This high adoption rate indicates an awareness of the importance of social media for engaging users and disseminating information. However, our evaluation revealed that most of these social media pages are either inactive or infrequently updated. This lack of engagement undermines the potential impact of such platforms. For social media integration to be effective, libraries must be present and actively interact with users through regular updates,

events, and feedback-driven content.

2. Blogs: Only 1 out of 15 libraries maintains blogs (the University of Ben Youssef Ben Khedda Algiers 1). This extremely low rate indicates a significant underutilization of blogs as a communication and information-sharing tool.

3. RSS Feed availability: findings show that 26.67% of libraries offer RSS feeds. While higher than blog usage, this still represents a minority, suggesting room for improvement in providing automated content updates to users.

4. FAQs availability: Only 20% of libraries provide frequently asked questions on their websites. This low percentage indicates a potential gap in addressing common user inquiries efficiently.



5. Feedback forums: Only the library of the University of Tamanrasset offers feedback forums. This suggests a lack of formal channels for user input and community engagement on most library platforms.

6. Mobile app availability: Again, only 1 out of 15 surveyed libraries has a mobile application, the library of the University of Tamanrasset. The limited implementation of mobile technology may limit accessibility for users who prefer mobile devices.

The overall picture suggests that while these libraries have taken initial steps into Web 2.0, a more comprehensive strategy is needed to fully leverage these technologies for improved library services. International research also highlights that the effectiveness of such tools depends not only on their availability but also on their visibility and integration into users' daily practices. For example, a study at Champlain College found that even when online communication channels with librarians were available, they remained largely invisible and underutilized by faculty and students (Faulk & Crist, 2020). This confirms that the challenge for Algerian university libraries is not only technological adoption but also the communication and engagement strategies needed to make these tools meaningful and impactful.

4. RESULTS OF THE STUDY:

The evaluation of Algerian university library websites revealed several findings concerning their usability, accessibility, and effectiveness in providing digital collections:

- Overall, most websites were well-structured and easy to navigate, with clear menus and identifiable links. However, many websites lacked multilingual support, which could make it difficult for non-Arabic-speaking users to access important information, limiting cross-cultural and international scholarly communication. It reflects the linguistic and institutional context in Algeria, where Arabic and French coexist and English is increasingly used in academia, affecting inclusivity and global reach.
- Although basic search functions were present, many websites did not offer advanced search options, making it harder for users to refine their searches and locate specific resources efficiently, reducing effective academic communication and knowledge discovery.
- While access to academic theses and research papers was widely accessible through repositories, resources such as e-books, multimedia content, videos and interactive learning materials were almost absent, limiting the diversity of available resources and formats.
- Services such as virtual reference assistance, online book reservations, and document delivery were rarely available, thereby significantly limiting remote access, asynchronous



communication, and user support. This is partly linked to institutional norms in Algeria, where libraries have historically operated as on-campus, service-focused units rather than integrated digital hubs.

- User engagement tools such as Web 2.0 features were underutilized. While some libraries had integrated social media, very few provided blogs, discussion forums, or mobile applications, limiting opportunities for interaction, research collaboration, and real-time academic communication.
- The evaluation incorporated WCAG 2.1 criteria, focusing on navigation ease, browser compatibility, mobile responsiveness, structured menus, and search tool usability. While some websites performed well on these measures, others lacked in providing a fully accessible experience, restricting inclusive communication, especially for users with disabilities.

The main challenges identified across the evaluated websites include insufficient *multilingual access, limited digital content variety, underdeveloped remote services, and a lack of accessibility compliance*. These challenges restrict the user experience, equitable access to digital collections, and effective scholarly communication, reflecting the broader economic and institutional limitations of Algerian higher education, including low budgets for library modernization and digital transformation initiatives.

5. CONCLUSION:

In conclusion, regular evaluations of Algerian university library websites are essential for maintaining accessibility, usability, and effective digital collection management, and efficient academic communication. While many websites demonstrated basic structural clarity and access to academic theses, major shortcomings persist, particularly in multilingual support, advanced search functionality, digital content diversity, and the provision of interactive services. Web 2.0 features, though partially integrated, were largely inactive or missing, limiting user engagement and interactive scholarly communication. These gaps are rooted in institutional, cultural, and economic

realities of Algerian higher education, such as limited funding, traditional service models, and evolving digital literacy among staff and users.

Finally, future research should utilize automated evaluation tools such as the WAVE Web accessibility evaluation tool (WebAIM, n.d.) to assess compliance with WCAG 2.1 and identify technical accessibility barriers. By addressing these challenges, Algerian university libraries will be



able to strengthen their digital infrastructure and provide an inclusive environment for students and researchers.

6. RECOMMENDATIONS:

Based on the findings, the study proposes the following recommendations:

- Implementation of multilingual interfaces to improve inclusivity and access for non-Arabic-speaking users.
- Expansion of digital collections to include e-books, multimedia resources, and interactive learning materials to support multimodal knowledge sharing. Addresses cultural and resource limitations that prioritize text-based academic outputs.
- Development of essential online services such as virtual reference, online reservations, and document delivery systems to strengthen remote and asynchronous communication.
- Actively manage and update Web 2.0 platforms (e.g., social media, blogs, forums) to encourage user interaction and knowledge sharing.
- Employ automated accessibility tools to evaluate and maintain compliance with international accessibility standards.
- Provide continuous training for library and information technology (IT) staff to ensure sustainable digital services and support effective academic communication, addressing institutional and economic limitations in staffing and digital skills development.

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