THE ROLE OF ACADEMIC LIBRARIES IN FOSTERING INTERDISCIPLINARY RESEARCH AND INNOVATION

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Abstract

Academic libraries have evolved beyond repositories of books into dynamic centers for research collaboration, knowledge creation, and technological innovation. In an era defined by complex global challenges ranging from climate change to public health crises interdisciplinary research has become essential for generating holistic solutions. This paper explores the critical role of academic libraries in fostering interdisciplinary research and innovation, with a specific focus on Nigerian higher education institutions. It highlights how libraries, through digital infrastructure, open access initiatives, institutional repositories, data curation, and research support services, facilitate collaboration across disciplines. The paper also examines the emerging roles of librarians as research partners, digital curators, and innovation catalysts in academia. Furthermore, it discusses the challenges faced by libraries in fulfilling this role, including funding limitations, inadequate technological infrastructure, and limited interdepartmental collaboration. Finally, the paper proposes actionable strategies for enhancing the library's contribution to interdisciplinary research, emphasizing digital transformation, policy alignment, staff capacity development, and strategic partnerships.

Keywords: Academic Libraries, Interdisciplinary Research, Innovation, Knowledge Sharing, Research Data Management, Collaboration, Digital Transformation.

Introduction

In the 21st century, academic libraries have transformed from passive information custodians into active

agents of knowledge creation and innovation. This transformation is largely driven by the increasing

need for **interdisciplinary research** a mode of inquiry that integrates perspectives, methods, and insights from multiple disciplines to solve complex problems that cannot be addressed by a single field alone (Jacobs & Frickel, 2009). Challenges such as climate change, poverty, pandemics, artificial intelligence, and social inequality demand collaborative and cross-disciplinary solutions.

In this context, **academic libraries** occupy a strategic position at the intersection of research, teaching, and innovation. They provide scholars and students with access to diverse information resources, advanced research tools, and collaborative environments that facilitate interdisciplinary engagement. As highlighted by **Tenopir et al. (2021)**, libraries are increasingly recognized as essential partners in the research process offering expertise in information management, data analysis, digital scholarship, and open science.

In Nigeria, the role of academic libraries is undergoing rapid redefinition in response to the government's and universities' efforts to promote innovation, entrepreneurship, and interdisciplinary collaboration. Institutions such as Kaduna State University (KASU) and Ahmadu Bello University (ABU) Zaria exemplify this shift through the digitization of library systems, establishment of institutional repositories, and creation of research commons designed to enhance collaboration across disciplines.

This paper examines how academic libraries in Nigeria and globally can strengthen their role in fostering interdisciplinary research and innovation. It begins by exploring the conceptual relationship between libraries and interdisciplinary research, followed by an analysis of libraries' contributions to innovation ecosystems. It then discusses the challenges faced by libraries and proposes practical strategies for maximizing their potential as hubs of interdisciplinary collaboration.

Theoretical Framework

The study adopts the **Knowledge Commons Framework** (Hess & Ostrom, 2007) and the **Triple Helix Model of Innovation** (Etzkowitz & Leydesdorff, 2000) as its guiding theoretical lenses.

The **Knowledge Commons Framework** conceptualizes libraries as communal spaces where knowledge is collectively produced, shared, and reused through institutional governance. It aligns with the notion that academic libraries serve as facilitators of open knowledge ecosystems that transcend disciplinary and institutional boundaries.

The **Triple Helix Model**, on the other hand, posits that innovation arises from interactions among three key actors universities, industry, and government. Within this triad, libraries serve as mediators that enable data sharing, collaborative research, and knowledge translation between academia and external stakeholders. Thus, libraries are not merely service units but strategic agents that sustain innovation networks and interdisciplinary communication.

Review of Related Literature

The Evolution of Academic Libraries in the Digital Age

The traditional role of academic libraries as repositories for printed materials has been reshaped by digital transformation. Libraries now operate as **hybrid information systems**, combining physical collections with digital repositories, online databases, and virtual learning environments (Afolabi, 2022). As Corrall (2019) notes, the modern academic library is an "ecosystem of knowledge," supporting research data management, open access publishing, and digital scholarship.

Digital transformation has enabled libraries to support interdisciplinary research in several ways:

1. By facilitating access to multidisciplinary databases and e-resources.
2. By developing institutional repositories that host research outputs across disciplines.
3. By establishing digital labs and research commons that foster collaborative inquiry.
4. By providing training on research tools, data analytics, and scholarly communication.

Libraries and Interdisciplinary Research

Interdisciplinary research relies on integrating diverse information sources, terminologies, and methodologies. According to National Academies of Sciences (2005), libraries play a central role in enabling this integration by managing knowledge systems that connect disciplines. For instance, library classification schemes, metadata standards, and discovery platforms can either facilitate or hinder cross-disciplinary exploration.

Oladokun (2021) argues that libraries in Nigerian universities are becoming catalysts for interdisciplinary collaboration by providing infrastructure for shared research and by fostering a culture of openness. Through institutional repositories, research data management (RDM) platforms, and open access journals, libraries bridge disciplinary silos and support the co-creation of knowledge.

The Librarian's Evolving Role

The role of librarians is shifting from that of "custodians" to "research partners." As Cox et al. (2019) describe, librarians now act as data curators, digital facilitators, and co-researchers who support data analysis, visualization, and citation management. In interdisciplinary contexts, librarians guide researchers in navigating diverse data sets, managing metadata standards, and ensuring compliance with open science mandates.

In Nigeria, this transformation is visible in initiatives like Nigerian Research and Education Network (NgREN) and Nigerian Library Association's Research Data Services Program, which train librarians to provide specialized research support in data science, bibliometrics, and open access publishing.

The Role of Academic Libraries in Fostering Interdisciplinary Research

1. Provision of Access to Multidisciplinary Resources

Libraries curate and provide access to diverse digital and print resources across multiple disciplines. By subscribing to multidisciplinary databases such as JSTOR, ScienceDirect, Scopus, and EBSCOhost, libraries enable researchers from varied fields to discover interrelated content. This cross-disciplinary

visibility encourages collaboration between departments such as health sciences, engineering, and social sciences within universities (Tenopir et al., 2021).

2. Institutional Repositories and Open Access

Institutional repositories (IRs) play a critical role in archiving and disseminating research outputs across faculties. They serve as digital memory banks that make interdisciplinary findings accessible to global audiences. As Suberu and Musa (2023) observe, IRs in Nigerian universities, including those at KASU and ABU, have become tools for enhancing visibility, collaboration, and innovation.

Open access (OA) further democratizes knowledge by breaking paywall barriers. Through OA journals and repositories, research findings from engineering can inform social policy, while discoveries in medicine can shape economic and educational reforms.

3. Research Data Management and Curation

With the rise of data-intensive research, libraries increasingly offer Research Data Management (RDM) services that support the collection, organization, preservation, and sharing of datasets. RDM fosters collaboration across disciplines, as researchers can reuse data for secondary analysis and innovation.

Libraries at institutions like ABU Zaria and University of Ibadan have piloted data curation projects that support collaborative work in agriculture, climate science, and health informatics (Nwosu & Olatunji, 2022). This demonstrates how libraries operationalize interdisciplinarity through data governance frameworks.

4. Digital Scholarship and Technology Support

Digital scholarship services such as text mining, GIS mapping, and visualization are essential for interdisciplinary research. Libraries often provide digital labs or "makerspaces" equipped with these tools. Through ICT integration and research commons, libraries support innovative methodologies that merge data science, humanities, and social sciences.

5. Knowledge Sharing and Collaborative Spaces

Libraries foster collaboration by providing physical and virtual spaces such as research commons, seminar rooms, and online collaboration platforms. These spaces encourage dialogue and cross-pollination of ideas among scholars.

For instance, the Kashim Ibrahim Library (KIL) at ABU Zaria established a Research Support and Collaboration Unit, which hosts interdisciplinary research roundtables. Similarly, Kaduna State University Library organizes inter-faculty workshops to promote information literacy and collaborative grant writing.

6. The Librarian as Research Partner

Librarians increasingly participate in grant applications, project design, and co-authorship. Their expertise in citation analysis, data organization, and research ethics complements disciplinary knowledge. As Pinfield, Cox, and Rutter (2019) highlight, librarians' involvement as research partners enhances the rigor and impact of interdisciplinary research.

Academic Libraries as Innovation Hubs

Innovation thrives in environments that encourage curiosity, collaboration, and access to knowledge. Academic libraries have become innovation hubs by connecting researchers, entrepreneurs, and policy actors through programs such as hackathons, innovation labs, and entrepreneurship support.

At Kaduna State University, the University Library collaborates with the Centre for Innovation and Entrepreneurial Development to provide information resources for startups and innovators. Similarly, ABU Zaria's Kashim Ibrahim Library partners with the ICT Directorate to host digital innovation boot camps that engage students from computer science, architecture, and business studies.

Globally, libraries like the MIT Media Lab Library and Stanford University Libraries model this role by integrating library services with entrepreneurship incubators and technology transfer offices. These

examples highlight how libraries facilitate interdisciplinary collaboration between academia and industry.

Challenges Facing Academic Libraries in Supporting Interdisciplinary Research

1. Funding Limitations

Budgetary constraints remain the greatest barrier to library innovation. Many Nigerian libraries operate with limited funds that restrict access to multidisciplinary databases, modern infrastructure, and skilled personnel (Ezeani & Igwe, 2021). This underfunding limits their ability to provide adequate support for complex research projects.

2. Digital Infrastructure Deficits

Reliable broadband, cloud storage, and research management systems are essential for digital scholarship. However, frequent power outages and weak ICT networks in Nigerian institutions hinder the effective delivery of RDM and open access services (Afolabi, 2022).

3. Limited Collaboration and Institutional Silos

Academic departments often work independently, creating barriers to interdisciplinary collaboration. Libraries sometimes struggle to integrate their services into university-wide research strategies due to bureaucratic structures and lack of cross-departmental communication (Nwosu & Olatunji, 2022).

4. Skills Gap and Professional Development

Librarians require advanced training in data science, bibliometrics, and digital scholarship. However, opportunities for capacity building remain limited, especially in developing countries. Without these skills, librarians may find it difficult to fully participate in complex interdisciplinary projects (Oladokun, 2021).

5. Policy and Governance Issues

Many universities lack formal policies guiding data sharing, intellectual property, or interdisciplinary research collaboration. Libraries often operate without clear mandates or frameworks to manage such initiatives, which reduces institutional commitment to library-driven innovation (Suberu & Musa, 2023).

Strategies for Enhancing the Role of Academic Libraries

1. Strengthening Digital Infrastructure

Universities must prioritize investments in ICT, databases, and digital repositories. Establishing cloud-based RDM platforms and open access systems will expand collaboration and global visibility.

2. Capacity Building for Librarians

Continuous professional development should be institutionalized. Training in data analytics, research metrics, grant writing, and digital scholarship will empower librarians to contribute meaningfully to interdisciplinary teams.

3. Promoting Collaborative Culture

Libraries should actively initiate partnerships with faculties, research centers, and industry. Hosting interdisciplinary forums, seminars, and research clinics can break silos and stimulate collaboration.

4. Policy Integration and Institutional Support

Universities should integrate library functions into their research and innovation policies. The library's contribution to research output, data management, and innovation should be formally recognized in strategic plans.

5. External Partnerships and Funding

Libraries should pursue collaborations with international organizations such as IFLA, UNESCO, and EIFL for grants and capacity-building support. Public–private partnerships can also help bridge infrastructure and funding gaps.

6. Advocacy and Visibility

Librarians must advocate for their role as research partners, not just service providers. Publishing collaborative research, participating in grant projects, and engaging with policymakers can enhance recognition.

Nigerian Universities

Kaduna State University (KASU)

KASU Library has developed an Institutional Repository (KASUIR) that aggregates theses, dissertations, and publications across faculties. It also provides information literacy training to promote effective interdisciplinary research. Collaboration with the Faculty of Science and Social Sciences has led to projects integrating GIS mapping with community development research.

Ahmadu Bello University (ABU) Zaria

The Kashim Ibrahim Library (KIL) and ICT Directorate jointly operate a Digital Scholarship Hub that supports interdisciplinary research in agriculture, engineering, and health sciences. The library's Bibliometrics Unit assists departments in evaluating research impact and fostering cross-disciplinary collaborations.

These initiatives illustrate how libraries can bridge academic boundaries, enhance institutional visibility, and stimulate innovation.

Conclusion

Academic libraries are indispensable to the advancement of interdisciplinary research and innovation. They provide the infrastructure, expertise, and collaborative spaces that enable scholars from diverse disciplines to work together on complex problems. In the Nigerian context, libraries are gradually transforming into innovation ecosystems—integrating digital repositories, research data management systems, and open access platforms that foster collaboration and visibility.

However, to maximize their impact, libraries must overcome challenges related to funding, infrastructure, and professional development. With strategic investments, policy integration, and global partnerships, academic libraries can serve not only as custodians of knowledge but as catalysts for innovation and interdisciplinary transformation in higher education.

Way Forward

1. Invest in digital infrastructure and open access systems to support interdisciplinary visibility.

2. Empower librarians through continuous training in research data management and digital scholarship.

3. Institutionalize library–faculty collaborations for joint research and innovation projects.

4. Develop policies and frameworks for interdisciplinary research governance and data ethics.

5. Promote advocacy and awareness of the library's strategic role in research and innovation.

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