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## **ADOPTION OF OPEN SCIENCES FOR COLLABORATIVE RESEARCH AMONG ACADEMIC LIBRARIANS IN NIGERIA UNIVERSITIES**

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### **Abstract**

*This study explored Adoption of open science for collaborative research among academic librarians in Nigeria universities. Open Science encompass a range of practices, including but not limited to open access publishing, data sharing, and collaborative platforms, all geared towards creating a more inclusive and dynamic research environment. Three (3) Objectives will guide the study, this study is restricted to librarians in Nigerian academic libraries. Low quality of research visibility, the importance of collaborative research and low collaborative research productivity are some of the questions this study is set to answer. Intellectual Property and Commercialization, Sustainability and Long-Term Maintenance, Quality Control and Standardization and Resistance to Change are some of the challenges in migrating adoption of open science among librarians in Nigerian Universities. Open science is significance among librarians in Nigeria universities due to his potential to reshape the research landscape, making it more collaborative, transparent, and accessible, it also impact the scientific community, education, policymaking, and the advancement of knowledge for the collective benefit of humanity. This is because the success or failure of the library service depends on librarians in advancing research and innovation through digital transformation. The paper recommends that librarians should collaborate with other professionals to develop new technologies. Librarians need to adopt more open science platforms to make their research visibility.*

**Keywords:** *Collaborative, Open Sciences, Librarian, Nigeria, Research.*

## Introduction

Open science, also known as open scholarship, is an umbrella term that encompasses the principle that scientific knowledge should be openly accessible, transparent, rigorous, reproducible, replicable, accumulative, and inclusive in all appropriate contexts, which are considered fundamental features of the scientific endeavor (Parsons et al., 2022). The adoption of open sciences has aid in changing in research culture. The concept of Open Science is rooted in the belief that knowledge is a public goods and should be freely accessible to all. Open Science encompass a range of practices, including but not limited to open access publishing, data sharing, and collaborative platforms, all geared towards creating a more inclusive and dynamic research environment

In developing country like Nigeria open science is still new and an emergent concept, and the number of grassroots networks dedicated to promoting open science in developing countries remains limited. Western perspectives and values dominate international journals and work from developing countries is often misunderstood or deemed irrelevant to editors/audiences in developed countries (Ledgerwood et al., 2024). The scarcity of voices from developing countries not only contradicts the core values of the open science adpotion, diversity, equity, inclusivity, accessibility, and social justice but also probably widens the research gap between developing and developed countries. The principles of research data management, open science and promote transparency at every phase of the research process and highlight the appropriate management of scientific information. Promotion of openness, cooperation, and long-term access to research products are crucial principles for increasing the sustainability of library and information science education.

A preliminary research on open science in developing countries by Onie, (2020) posited that researchers from developing countries have begun to make their voices heard on a larger scale.

Many are calling for a redesign of open science to better suit their unique needs, supporting grassroots local open science networks including researchers with experience in the developing world in open science projects. However, highlighting these issues alone is insufficient, concrete actions are necessary to drive real change. Many journals societies, and funding agencies now advocate open data, open materials, open code, free and open-source software, open access, open peer review, and open educational resources. In some countries, scientists and other interested parties (e.g., funding agencies) actively reshape policies and incentive systems (e.g., new funding unit for meta science in the UK, (Jeftic et-al., 2024)

Open Science has changed the way scientific knowledge is produced and disseminated, promoting transparency and access, an example of this is the continuous scientific journals and publishers adhering to the open access model, wanting to provide knowledge to both authors and readers. A collaborative study by Chan et al., (2019). Posited that open science are redefining these norms by advocating for collaborative and transparent practices that aim to revolutionise the way research is conducted, disseminated, and utilised. One of the primary challenges in adopting Open Science in developing countries is the lack of digital infrastructure, reliable internet access, cloud storage, and research repositories are often unavailable or limited, making it difficult for researchers to participate in open-access initiatives. Additionally, financial barriers present a major obstacle, as many researchers cannot afford the high costs associated with open-access publishing, data management, and software licensing (Tenopir et al., 2020).

A study in Nigeria by Saibakumo, (2021). posited that Open science will enable librarians in Nigeria universities to have access to collaborative research. It aims is to make scientific research more accessible, transparent and collaborative among universities libraries. In Nigeria, the implementation of sustainable open science practices is still in its nascent stages. Several studies have highlighted the challenges faced by Nigerian libraries which, including

inadequate funding, limited access to digital resources, and a lack of trained personnel. A collaborative studies by Diseiye et al. (2023) revealed that at professional level, open digital literacy for self-sufficiency as the driver of the use of emerging technologies among library professionals. Despite these challenges, there have been efforts to promote sustainable practices through the adoption of Open Science.

According to Nazim and Ali, (2023) Open Science is seen as a way to democratise access to information and foster collaborative research efforts among academic librarians which is crucial for fostering a culture of sharing and collaboration among researchers. The collaborative training resulted in improved cross fertilisation of knowledge from international perspective, librarians, students and researchers and their visibility also increased. The idea of collaborative research in academic libraries has been a major concern to many heads of libraries in Nigeria universities of higher learning for decades. Most academic libraries today have not recognised the importance of collaboration which has the potential to enhance the knowledge stocks within the library. Thus, the inability of the authorities of universities to effectively harness and enhance the knowledge stocks within the library has led to low research collaboration among librarians are some of questions this study is set to answer. This study is restricted to academic librarians in Nigeria universities. Even though the adoption of open science in Nigeria universities by academic librarians is low there is a gap in understanding collaborative research influence among librarians which will improve the quality of research, visibility of librarians and mentoring of scholars.

Research collaboration is not new among academic librarians. Advancements in teaching and research in tertiary educational institutions have led to the integration of the efforts of academics and scholars through research collaboration. Both international educational organisations such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and national bodies such as the National Universities Commission (NUC), the

National Commission for Colleges of Education (NCCE) and the National Board of Technical Education (NBTE), as well as other research funding agencies, are encouraging research collaboration at national and international levels as a way of encouraging high-impact publications and ameliorating the quality of teaching and researching (UNESCO,2002;Jeong et al.,2014).

Collaboration in research are activities designed to improve the quality of research and enable individuals to grow professionally. Manpower training and development is useful for effective information service delivery in the library, an investigation by Ayo-Lawal, et-al (2022), revealed that collaborative research is on the rise and this rise is attributable to attempts directed at solving global problems such as climate change that span disciplines and nations and advances in information, food security and communication technology. Research collaboration enable librarians to published article from joint research, helps to increase the professions information resources. Research collaboration is harnessing the contribution of unique ideas and experience from diverse people for solving research problems. Salami et al. (2021), posited that research collaboration improves in quality of research in the library profession as well as the number and value of research. If librarians do not engage in research collaboration, the profession may not be able to cope with novel changes as well as international benchmarks in research.

Yemini (2021) noted that language skills were identified as a crucial factor in stimulating research engagement. They author observed that non-native English speakers sought research collaboration to leverage co-researchers communication skills to improve the readability and acceptance of articles for publication. In addition, the language skills possessed by English speakers aid in editorial work. Collaboration allows researchers in developing countries to access funding. They can apply for research grants with an experienced team mate to produce quality research. Collaborative research enhance knowledge sharing as teams work together,

information on research opportunities is disseminated in various outlets and transfer to members for inform decision making (Wao, et-al, 2021). Research collaboration involves the contribution of specialised knowledge with other researchers particularly in inter-disciplinary and international research.

## **Review of Related Literature**

### **Concept of Open sciences**

An investigation by Onie, (2020) posited that researchers from developing countries have begun to make their voices heard on a larger scale. Many are calling for a redesign of open science to better suit their unique needs, supporting grassroots local open science networks including researchers with experience in the developing world in open science projects. However, highlighting these issues alone is insufficient concrete actions are necessary to drive real change (Jeftic et-al., 2024). Open access resources (OARs) also enable transparency in scholarly communication by providing unrestricted access to research outputs and repositories enable greater transparency in the research process, facilitating scrutiny, collaboration, and the advancement of knowledge. OARs recognise the societal benefits of freely accessible research. They support the notion that scholarly knowledge is a public goods that should be shared for the betterment of society, fostering innovation, education, and social progress and justice (Furnival, 2010). This promotes the inclusion of diverse perspectives and voices in academic discourse especially those in Africa, may leverage in the development to communicate their research findings globally in order to change the global academic narration that has been promoted by the Global North-dominated publishing landscape (Kodua-Ntim & Fombad, 2020).

### **Benefits of Open Sciences**

The open science movement brings significant opportunities to researchers in developing countries by providing free access to a wealth of research-related resources. Platforms like

Open Science Framework (OSF, [osf.io](https://osf.io)), GitHub ([github.com](https://github.com)), and Zenodo ([zenodo.org](https://zenodo.org)), alongside domain-specific repositories such as PsyArXiv, bioRxiv and OpenNeuro, offer open-access literature, data, software, and educational materials, breaking down barriers imposed by paywalls. These resources significantly enhance the learning, teaching, and research capabilities of researchers in developing countries, especially when language barriers are addressed. Open access (OA) papers, preprints, and post-prints now constitute a substantial portion of scientific literature (UNESCO, 2023), while initiatives like the Framework for Open and Reproducible Research Training (FORRT) democratise open science education and meta science.

**Enhancing Scientific Rigor and Reproducibility:** Open Science Initiatives contribute to the improvement of scientific rigor by promoting transparency in research methodologies and encouraging the sharing of raw data. This, in turn, facilitates the reproducibility of studies, a cornerstone of scientific credibility. **Accelerating Scientific Discovery:** By fostering collaboration and removing barriers to information, Open Science accelerate the pace of scientific discovery. Real-time collaboration and data sharing enable researchers to build on each other's work, leading to quicker advancements in knowledge. **Democratising Access to Knowledge:** Open access publishing, a key component of open science, ensures that research findings are freely accessible to a global audience. This democratisation of knowledge eliminates financial barriers, allowing researchers, educators, policymakers, and the public at large to access the latest scientific insights.

**Interdisciplinary Collaboration:** Open Science Initiatives break down storage tower and facilitate interdisciplinary collaboration. Researchers from different fields can collaborate seamlessly, bringing diverse perspectives and expertise to address complex scientific challenges. **Global Impact and addressing grand challenges:** The collaborative and transparent

nature of open science is particularly crucial for addressing global challenges, such as climate change, pandemics, and sustainable development. Open Science enables the pooling of resources and expertise on a global scale to tackle these pressing issues and capacity building development. (Moorthy et al., 2020).

**Credibility and Trust in Science:** Open Science practices, including open data sharing and transparent methodologies, contribute to the credibility of scientific research. Increased transparency builds trust among researchers, institutions, and the public, fostering a more robust scientific ecosystem. **Innovation and Technology Transfer:** Open science facilitates the transfer of knowledge and technology between academia, industry, and other sectors. This exchange of ideas and innovations has the potential to drive technological advancements, economic growth, and societal progress (Bezuidenhout et-al, 2019).

### **Challenges of Open Sciences**

**Data Privacy and Security Concerns:** Open data sharing raises concerns about privacy and security, particularly when dealing with sensitive or personal information. Striking a balance between openness and protecting individual privacy is a complex challenge. **Quality control and standardisation:** The open dissemination of research may lead to challenges in maintaining quality control. Ensuring the reliability and validity of data shared openly can be difficult without robust mechanisms for validation and standardisation. **Incentive Structures and Recognition:** Traditional academic reward systems often prioritise publication in high-impact journals. Researchers may hesitate to adopt open practices due to concerns about how these initiatives align with existing incentive structures for career advancement and recognition (Ledgerwood et al., 2024).

**Digital Divide and Accessibility:** The digital divide can hinder equal participation in open science initiatives. Researchers in resource-constrained environments may lack access to the

necessary technology and infrastructure, limiting their ability to engage fully in collaborative and open research. **Intellectual Property and Commercialisation:** Balancing the principles of open access with the protection of intellectual property rights and the potential for commercialisation can be challenging. Researchers and institutions may be cautious about openly sharing information that could have commercial value. **Cultural Resistance and Tradition:** Traditional research cultures may resist a shift towards openness, and researchers may be hesitant to share data and methods due to concerns about intellectual property, competition, or fear of being scooped. **Lack of Standardised Metadata and Protocols:** The absence of standardised metadata and protocols for data sharing can hinder interoperability and make it challenging to integrate and compare data across different studies and disciplines. **Sustainability and Long-Term Maintenance:** There may be concerns about the sustainability of open repositories and platforms. Ensuring the long-term maintenance of open resources requires dedicated funding and organisational commitment. **Overemphasis on Quantitative Metrics:** Open Science practices may inadvertently reinforce a reliance on quantitative metrics (e.g., citation counts) for evaluating research impact, potentially overlooking the broader societal impact and qualitative aspects of research. **Resistance to Change:** Researchers, institutions, and publishers accustomed to traditional models may resist the cultural shift towards open science, creating challenges in the widespread adoption of these initiatives (Thomas 2020).

### **The Concept of Research Collaboration**

Research collaboration is a situation in which researchers work together to accomplish an identified objective, which is the production of novel scientific knowledge (Leite &Pinho, 2017). Research collaboration entails an interaction between/among people of the same or different backgrounds to carry out research and apply the research findings to solve specific societal problems (Teirlinck and Spithoven, 2013). Research collaboration requires the

integration of the intellectual prowess of scholars (Fari and Ocholla, 2016). Individuals, groups, departments, institutions, sectors and/or countries can collaborate to research a particular goal. The collaborations can be multidisciplinary, interdisciplinary or inter regional (Onyancha, 2011).

An investigation by Ayo-Lawal, et-al (2022) revealed that research collaboration is also on the rise and this rise is attributable to attempts directed at solving global problems such as climate change that span disciplines and nations and advances in information and communication technology. Kajberg (2009) posited that collaboration is a strategic means of tackling problems like skills incompetence, funding shortage of manpower etc facing the development of academic librarians. He explained that the dawn of the digital age and the constantly changing global outlook make collaboration inevitable. Collaboration allows researchers in developing countries to access funding. These researchers can apply for research grants with an experienced team mate to produce quality research. Collaborative research enhance knowledge sharing as teams work together, information on research opportunities is disseminated in various outlets and transfer to members for inform decision making (Wao, et-al, 2021).

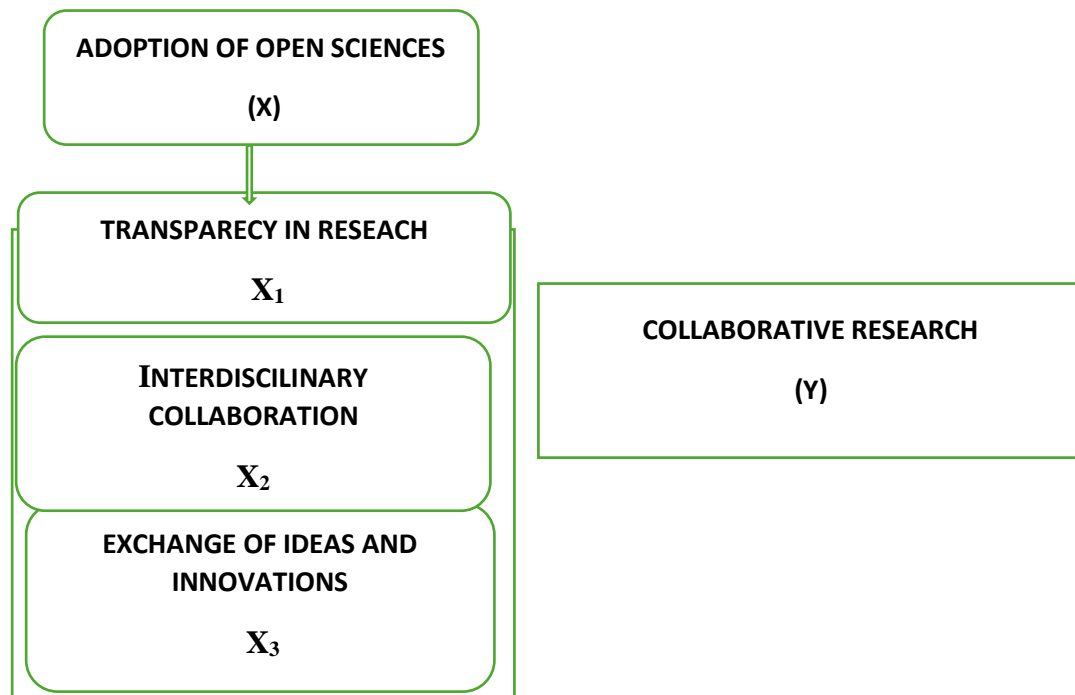
### **Importance Collaboration among Academic Librarians**

Collaborative efforts allow universities libraries to pool resources, including budgets, collections, and staff expertise. This can lead to cost savings, efficient resource allocation, and the ability to acquire a broader range of materials and technologies than single libraries could afford.

Collaboration encourages the exchange of best practices, innovations, and professional development opportunities among librarians. This ensures that librarians stay up-to-date with the latest trends and technologies, benefiting library users. Libraries that collaborate have a stronger collective voice when advocating for policy changes, funding, or support from

government agencies and other stakeholders. Collaboration amplifies their impact and increases their ability to influence decisions that affect the library profession. Collaboration by librarians can extend beyond borders in an increasingly interconnected world, fostering international partnerships and promoting cross-cultural understanding. This global perspective enriches library collections and services. Collaborative projects often serve as incubators for innovation by librarians. Libraries can experiment with new technologies, services, and approaches more effectively with collaborative partners' support and shared knowledge (Ashikuzzaman 2023).

### Conceptual Model



**Source: Researcher's Conceptual Model (2025)**

### Conclusion

The study explore adoption of open sciences and collaborative research among academic librarians in Nigeria universities, in Nigeria. The emergence of open sciences has increase academic libraries services among academic librarians in Nigeria, The academic librarians

should collaborate in writing articles, monographs, conference papers, chapters in books, occasional papers, conference proceedings, textbooks, book reviews, edited books and editorial notes. Collaboration should be majorly international and multidisciplinary, as this will enhance international integration among universities librarians and library and information science professionals. Adoption of open science has improved accessibility, research and innovation and collaborated service. This means that it has become a very useful tool in the hands of librarians' whose role is to support teaching, learning and research. As such, professional librarians should benefit from the power of open science initiatives by providing free access to a wealth of research-related resources, by fostering collaboration and removing barriers to information, Open science accelerate the pace of scientific discovery and facilitates the transfer of knowledge and technology between academia, industry, and other sectors.

#### **Way forward:**

Therefore, it is recommended that librarians in academic libraries should engage in cross-fertilisation of ideas and proficiencies and the exchange of knowledge at national and international levels through research collaboration to improve the quality of research that emanates from the library profession. Young librarians should be mentored by older and more experienced librarians on basic research principles and ethics and how to ensure that the research meets global standards.

And computer literacy skills, metadata skills, information literacy skills and information retrieval skills etc. should be acquired. These skills are needed to effectively serve users and for librarians to remain at the top in open science Era.

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