

Awareness and Perception of Research Data Management (RDM) by Librarians in Selected Universities in Edo State

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Abstract

Research funding agencies and national governments increasingly require grant recipients to preserve and make their research data publicly accessible for reuse and further study. This study examines the awareness and perception of research data management (RDM) among librarians in selected universities in Edo State, focusing on Ambrose Alli University, the University of Benin, and Edo University. A descriptive survey research design was employed, utilizing a structured questionnaire for data collection. The study population comprised 94 librarians, and a total enumeration sampling technique was used. Out of the 94 distributed questionnaires, 69 were retrieved and analyzed using simple percentage, frequency count, mean, and standard deviation. Findings indicate that while librarians are generally aware of RDM, they perceive it as still emerging within academic libraries. The study also revealed that librarians possess the potential to effectively implement RDM services. However, challenges such as inadequate human resources, limited funding, and shrinking institutional support hinder effective RDM adoption. Additionally, the cost of RDM implementation and the need for specialized skills among librarians were identified as significant barriers. To enhance RDM adoption, the study recommends reskilling librarians through workshops, seminars, and conferences, ensuring adequate funding and human resource support for academic libraries, integrating research data into institutional repositories for improved visibility, and providing incentives to researchers to encourage data sharing.

Keywords: Research Data Management, Awareness, Perception, Academic Libraries, Data Visibility

Introduction

The rapid growth of scientific research output globally is largely driven by the economic and social benefits derived from research activities. Additionally, the increasing trend of cross-border and interdisciplinary collaborations, facilitated by government and institutional funding, has significantly boosted research productivity and the volume of research data generated (Tenopir et al., 2014). This expansion in research data has led to a growing emphasis on research data management (RDM) among various professional groups, including librarians, who play a crucial role in managing and disseminating scholarly information.

With the rise of e-science, academic libraries have new opportunities to participate in digital research infrastructures and address the challenges associated with research data management (Carlson & Garritano, 2010). Research data consists of information collected, observed, or created for the purpose of analysis to generate original findings (Rice, 2009). Managing these data effectively is essential for ensuring their accessibility, long-term preservation, and global visibility. RDM serves as a bridge between researchers, data service providers, and other stakeholders, thereby facilitating seamless communication and data sharing. Academic libraries are well-positioned to support researchers by offering RDM services that enhance research transparency, reproducibility, and integrity.

The role of academic libraries in RDM has gained prominence as institutions recognize the importance of structured data management. Many governments, funding agencies, and publishers now mandate researchers to develop data management plans and, in some cases, make their data publicly available (Coates, 2015). Given their existing role in curating and providing access to scholarly resources, academic libraries are expected to take the lead in supporting RDM initiatives (Brown, Wolski, & Richardson, 2015). Librarians, as information professionals, must adapt to these evolving demands by acquiring the necessary skills and tools for effective data stewardship.

As part of their expanding responsibilities, academic libraries are increasingly involved in infrastructure development and research support services (Akers & Doty, 2012). Conducting surveys to assess researchers' data management needs has become a common approach for shaping RDM services. The concept of data curation, which emerged in the 1990s from scientific information management and e-science, has since been adopted in various disciplines, including the digital humanities (Tenopir et al., 2015). Research data management involves organizing data from its initial collection through dissemination and long-term preservation, ensuring the reliability and verification of research findings (Whyte & Tedds, 2011).

Despite its significance, many researchers acknowledge a lack of skills and experience in managing and sharing their data effectively (Barone et al., 2017). This gap underscores the need for structured RDM support within academic institutions. Effective research data management ensures that data remains accessible beyond the conclusion of a study, aligning with mandates from funding agencies and scholarly publishers (Meyer, 2018). Additionally, it enhances research integrity by enabling data reuse, preventing redundancy, and reducing plagiarism risks.

In the academic environment, vast amounts of research data are produced, necessitating efficient management to support institutional research activities. Proper RDM practices enhance data accessibility, facilitate knowledge sharing, and save time and resources by preventing researchers from duplicating efforts. Given these benefits, academic libraries must re-evaluate their service portfolios to align with the evolving demands of data-driven research (Lyon, 2012). As key players in scholarly communication, librarians must not only increase their awareness of RDM but also actively engage in its implementation to support research excellence within their institutions.

Objectives of the study

The main objective of this study is to find out the awareness and perception of research data management by librarians in selected universities in Edo state. The specific objectives are (i)

I. To find out the level of awareness of research data management by librarians in academic libraries

II. To determine the perception of research data management by librarians in academic libraries

III. To find out the perceived challenges of research data management in academic libraries

Literature Review

According to Whyte and Tedds (2011) research data management concerns the organization of data from its entry to the research cycle through to the dissemination and archiving of valuable results. These services support the full data lifecycle including data management planning, digital citation, data creation and conversions (Tenopir, Birch and Allard 2012). One of the Benefits of research data management according to (Hodrens 2013)

is that, RDM aims at maximizing the value of scientific investment and also addresses concerns related to the integrity of the research process (Collins and Tabak 2014). These research processes includes planning research, collecting data, processing and analyzing data, publishing and sharing data, preserving data and reusing data (UK data service 2018).

The practice of research data management, enables a research data to be openly available (Coates 2015). It therefore gives room for other researchers to critique it, and also build on the existing knowledge. Thus, research data management encourages open publishing of research, campaigns of open access, encourage scientist to practice open note book science, and generally make it easier to publish and communicate scientific knowledge (Tammara and Casarora 2014).

In the last decade, library and information studies has shown a growing interest in the detail of the research process in part to the creation of a new depth of research support services in libraries (Corall 2014), due to the fact that a lot of scholarly publications has been produced in the research community. The recognition of the benefits of increases openness in research has attracted attention from academia, industry and government around the world (Jin, Wah, Cheng and Wang 2015).

Moreover, the mission of the university libraries in the contemporary digital world continues to be characterized as supporting learning and research activities (Gumpenberger, Wieland, and Gorraiz, 2012). Hence the academic library traditionally have a role in providing access to the scholarly record in many forms to researchers (Brown, Wolski, and Richardson, 2015). Researchers in higher education (HE) are producing ever increasing quantities of digital data in the course of their work which needs to be managed for both immediate and potential long term use (Borgman and Pryor 2012). This allow for the opportunity for librarians to practice research data management in libraries. However, academic libraries are increasingly source of infrastructure and research support in the area of data stewardship (Akers and Doty 2012), and directly assessing researcher data need through use of surveys. Hence as data produced as part of research take a wide range of forms, from statistics and experimental result to interviewing recordings and transcripts (Borgman 2012), there will be need for data to be collected stores analyzed and communicated (open data charter 2015).

Academic libraries just as any other institution are situated in a broader socio-cultural environment and are significantly affected by development in higher education and research economics, origination, communication technology and behavior of research communities (MaceviCiute 2014). However, academic libraries have a long history of supporting research activities by maintaining and dissemination scholarly information in universities (Corall, Kennan and Afzal 2018; Searle, Wolski. Simons and Richardson 2015). Therefore academic libraries are in the right position to offer research data management services because they have professional and infrastructures to facilitates research data management.

Research data management practice in academic libraries is seen as a natural extension of the existing library data curation support services to research (Latham 2017) which may also be composed to traditional library function paired with new services (Cox, Lyon and Pinfield 2017) Since open data movement is increasingly becoming a central element for modern science, which champions freedom to uses, re-use and redistribute data without restrictions beyond a requirement for attribution and share alike (Molly 2011), research data management as to be practiced.

Thus, Reinhalter and Walter (2014) emphasizes that the role of libraries in helping researchers deal with federal agencies new requirement for data management planning lead to the advocacy of research data management in academic libraries. A number of studies have examined the roles of libraries and types of services provided in university libraries in support of RDM (Akers, Sferdean, Nicholls, and Green 2014, Antell, Foote, Turner, and Shults 2014; Cox and pin filed 2014; Tenopir, Hughes, Allard, Frame, Birch, Baird, Lundeen 2015).

Thus, academic libraries must have a research data management policy for sustainability of research processes, assist researchers in writing data management plans, describe data, help in managing archived data, have a data repository to store data and enable collaboration with other institution, select data and handover, and there after offer guidance and training support to researchers.

Tuyl and Michalek (2015) carried out a faculty survey on data management practice of researchers at the university of Carnegie Mellon. The result found out that the level of awareness of the regulatory environment around research data management is moderate. The conclusion drawn from this is that librarians in the situation are aware of the funders

requirement for the practice of research data management, but RDS service is not yet fully practice.

Also, Corall, Kenan and Waseem (2013), carried out a survey on research data support activities of 140 librarians in Australia, new Zealand, Ireland and united kingdom. The result found that current levels of engagement in data management were lower than for bibliometrics, but a majority anticipated future involvement, especially in technology assistance, data deposit and policy development. Hence the result shows that fewer libraries in the aforementioned countries are aware of research data management practices, and are currently offering support in area of assistance with technology and infrastructures and tools and funding external data sets, while the other libraries are still planning to offer RDM in future.

However Avuglah (2015) carried out a survey in the state of the art of research data management and institutional preparedness at the university of Ghana, the result found that RDM that the UG is currently underdeveloped but with immense potentials for growth. The study also found out that UG have an existing polices and guidelines on RDM. Thus librarians in the University of Ghana are aware of RDM practices but only at the early stage.

Research Methods

This study adopted descriptive survey design. This study was conducted among researchers at Ambrose Alli University Library, Ekpoma, University of Benin Library, Benin City, and Edo University Library, Iyamho. The study population consisted of 94 professional and paraprofessional librarians across the three selected universities in Edo State. Given the relatively small population size, a total enumeration sampling technique was employed, ensuring all 94 librarians were included in the study. A structured questionnaire titled "Awareness and Perception of Research Data Management by Librarians in Academic Libraries" was used for data collection. The collected data were analyzed using simple percentages and frequency counts for demographic variables. Additionally, mean and standard deviation calculations, with a criterion mean set at 2.50, were utilized to address the research questions and interpret the findings effectively.

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

Research Question 1: What is the level of awareness of research data management in academic libraries?

Table 4.3.1: Awareness of Research Data Management

S/N	Awareness of research data management	Very High Level		High Level		Low Level		Very Low Level		Means	Standard Deviation	Decision
1.	Research data management plan	14	20.3%	28	40.6%	17	24.6%	4	5.8%	2.65	0.26	High level
2.	Data curation	16	23.2%	23	33.3%	17	24.6%	13	18.8%	2.60	0.41	High level
3.	Big data management	23	33.3%	24	34.8%	16	23.2%	5	7.2%	2.95	0.29	High level
4.	Data generation	24	34.8%	29	42%	10	14.5%	4	5.8%	3.08	0.23	High level
5.	Data storage	25	36.2%	30	43.5%	8	11.6%	6	8.7%	3.07	0.26	High level
6.	Data security	23	33.3%	25	36.2%	16	23.2%	5	7.2%	2.95	0.29	High level
7.	Data preservation	14	20.3%	24	34.8%	13	18.8%	12	17.4%	2.63	0.40	High level
8.	Data sharing	24	34.8%	28	40.6%	11	15.9%	5	7.2%	3.04	0.27	High level
9.	Data re-use	19	27.5%	27	39.1%	11	15.9%	6	8.7%	2.93	0.29	High level
10.	Data processing	27	39.1%	23	33.3%	9	13%	6	8.7%	3.09	0.30	High level
11.	Data description	23	33.3%	24	34.8%	14	20.3%	8	11.6%	2.89	0.34	High level
12.	Data long term preservation	20	29%	18	26.1%	22	31.9%	6	8.7%	2.78	0.34	High level
13.	Data publishing	18	26.1%	25	36.2%	12	17.4%	10	14.5%	2.78	0.37	High level
14.	Data retrieval	24	34.8%	28	40.6%	6	8.7%	8	11.6%	3.03	0.31	High level
15.	Data classification	16	23.1%	21	30.4%	20	29%	6	8.7%	2.74	0.32	High level
	Grand mean										3.20	High level

Source: Field Survey, 2019

Table 4.3.1 presents the mean ratings on the level of awareness of research data management (RDM) among librarians in academic libraries. The results indicate that respondents reported a high level of awareness across all the listed RDM components. The highest levels of awareness were recorded for **data processing** (Mean = 3.09) and **data generation** (Mean = 3.08), while the lowest was **data classification** (Mean = 2.74). The grand mean score of **3.20** suggests that librarians in the selected universities have a high level of awareness regarding research data management.

Research Question 2: What is the perception of research data management?

Table 4.3.2: Perception of Research Data Management

S/N	Perception of Research Data	Strongly Agreed	Agreed	Disagreed	Strongly Disagreed	Means	Standard Deviation	Decision
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	Management											
1.	I feel that RDM is still in its infancy	22	31.9%	30	43.5%	7	10.1%	6	8.7%	3.04	0.27	Agreed
2.	I feel participants of RDM must understand government and institutional politics	25	36.2%	28	40.6%	2	2.9%	8	11.6%	3.11	0.30	Agreed
3.	I feel that researchers lack expertise to pilot the affairs of RDM	16	23.2%	31	44.9%	8	11.6%	11	15.9%	2.78	0.35	Agreed
4.	I feel that RDM prevent loss of data	26	37.7	28	40.6%	2	2.9%	7	10.1%	3.15	0.27	Agreed
5.	I feel that RDM is heterogeneous	21	30.4%	29	42%	10	14.5%	5	7.2%	3.01	0.26	Agreed
6.	I feel that RDM is time consuming	18	26.1%	20	29%	16	23.2%	15	21.7%	2.59	0.46	Agreed
7.	I feel RDM requires too much skills	13	18.8%	29	42%	10	14.5%	17	24.6%	2.55	0.43	Agreed
8.	I feel librarians have nothing to do with RDM	6	8.7%	15	21.7%	19	27.5%	25	36.2%	2.03	0.48	Disagreed
9.	I feel RDM should be left for experts in other fields	14	20.3%	15	21.7%	14	20.3%	24	34.8%	2.28	0.59	Disagreed
10.	I feel RDM is part of the task a librarian should carry out	26	37.7	30	43.5%	2	2.9%	5	7.2%	3.22	0.22	Agreed
11.	I feel RDM can be carried by librarians effectively	28	40.6%	36	52.2%	2	2.9%	3	4.3%	3.28	0.16	Agreed
12.	I feel the training received by librarians is insufficient for RDM	23	33.3%	18	26%	9	13%	12	17.4%	2.83	0.44	Agreed
	Grand mean									3.09		Agreed

Table 4.3.2 presents the perception of librarians toward research data management. The findings reveal that respondents **agreed** with most of the listed statements, indicating a generally positive perception of RDM. The highest levels of agreement were recorded for "**RDM can be effectively carried out by librarians**" (Mean = 3.28) and "**RDM is part of the tasks a librarian should carry out**" (Mean = 3.22). However, respondents **disagreed** with statements suggesting that "**librarians have nothing to do with RDM**" (Mean = 2.03) and that "**RDM should be left to experts in other fields**" (Mean = 2.28), reinforcing the belief that librarians play a crucial role in RDM. The grand mean score of **3.09** indicates that librarians perceive RDM positively, although they acknowledge challenges such as expertise gaps and institutional constraints.

Research question 3: What are the perceived challenges of research data?

Table 4.3.3: Perceived challenges of research data management

S/N	Perceived Challenges of Research Data Management	Strongly Agreed		Agreed		Disagreed		Strongly Disagreed		Mean	Standard Deviation	Decision
1.	Unavailability of technical resources/support	27	39.1%	29	42%	6	8.7%	5	7.2%	3.16	0.24	Agreed
2.	Lack of institutional support	21	30.4%	26	37.7%	3	4.3%	19	27.5%	2.71	0.50	Agreed
3.	Inadequate funding	36	52.2%	24	34.8%	1	1.4%	2	2.9%	3.49	0.14	Agreed
4.	Lack of data sharing publicity lectures	23	33.3%	40	58%	3	4.3%	3	4.3%	3.20	0.16	Agreed
5.	Lack of incentives	24	34.8%	35	50.7%	4	5.8%	4	5.8%	3.17	0.20	Agreed
6.	Copyright issues	24	34.8%	30	43.5%	3	4.3%	8	11.6%	3.07	0.29	Agreed
7.	Lack of budget scope for funding data facilities	26	37.7%	32	46.4%	1	1.4%	8	11.6%	3.13	0.28	Agreed
8.	Skill set of the library work force	28	40.7%	31	44.9%	3	4.3%	3	4.3%	3.29	0.17	Agreed
9.	Cost of research data management	32	46.4%	28	40.6%	2	2.9%	7	10.1%	3.23	0.26	Agreed
10.	Lack of funding policies from the angle of government and institutions	28	40.6%	29	42%	3	4.3%	7	10.1%	3.23	0.26	Agreed
11.	Lack of trust	23	33.3%	27	39.1%	9	13%	10	14.5%	2.91	0.36	Agreed
12.	Lack of policies that protect the types of data to be shared and not to be shared	27	39.1%	26	37.7	3	4.3%	8	11.6%	3.12	0.31	Agreed
13.	Data mismanagement	31	44.9%	29	42%	2	2.9%	7	10.1%	3.21	0.26	Agreed
	Grand mean										3.00	

Table 4.3.3 highlights the perceived challenges of research data management in academic libraries. The findings show that all listed challenges were **agreed** upon by respondents, with mean scores above 2.50. The most significant challenges identified were **inadequate funding** (Mean = 3.49) and **skill set of the library workforce** (Mean = 3.29). Other notable challenges include **cost of research data management** (Mean = 3.23) and **lack of funding policies from government and institutions** (Mean = 3.23). The grand mean of **3.00** suggests that respondents strongly recognize financial constraints, insufficient training, and limited institutional support as major barriers to effective RDM implementation.

Discussion of Findings

The analysis of demographic variables indicates that the majority of librarians who participated in the study were female. A significant percentage of respondents were within the age range of 31–40, which aligns with the general age distribution of librarians in Edo State libraries.

Regarding research question 1 on the level of awareness of research data management (RDM) in academic libraries, findings from Table 4.3.1 reveal that librarians demonstrate a high level of awareness of RDM. This result aligns with the study by Antell, Foote, Turner, and Shults (2014), which highlighted that many librarians are cognizant of funding agency mandates and are actively preparing for data management responsibilities by enhancing their knowledge and skills. Similarly, Tripathi, Shukla, and Sonker (2017) found that universities acknowledge the importance of RDM and have begun integrating related services within their libraries.

For research question 2, which examines the perception of RDM in academic libraries, findings from Table 4.3.2 indicate that RDM is still in its early stages. This aligns with Zhou (2018), who noted that RDM is in its developmental phase and must undergo stages such as policy development, infrastructure establishment, service design, user engagement, and funding acquisition. Antell et al. (2014) similarly observed that RDM services in research libraries are still emerging. Additionally, findings suggest that librarians must understand institutional and governmental policies related to RDM, a view supported by Corall, Kenan, and Afzal (2013), who emphasized the necessity for academic librarians involved in research support to grasp such policies. The study also highlights that researchers often lack the expertise needed to effectively manage RDM, reinforcing the argument by Chiware and Becker (2018) that librarians require reskilling to meet evolving RDM demands. Furthermore, findings suggest that RDM helps prevent data loss, which aligns with Aydinoglu, Dorgan, and Taskin (2017), who found that RDM frameworks were developed to mitigate data loss and improve information accessibility. Additionally, findings confirm the heterogeneity of research data, a point supported by Kenan and Makaускаite (2015), who noted that research data vary based on their origins and formats.

For research question 3 on the challenges of RDM in academic libraries, findings from Table 4.3.4 indicate that copyright issues pose a significant challenge. This finding is consistent with Nhendodzashe and Pasipamire (2017), who noted that researchers often express concerns about copyright and data accessibility. Additional challenges identified include limited skill sets among library staff, high costs associated with RDM, economic constraints, limited institutional capacity, and increasing workloads due to shrinking resources. These findings align with Pinfield, Cox, and Smith (2014), who reported that the financial and infrastructural demands of RDM, along with workforce limitations and institutional collaborations, present significant obstacles. Furthermore, findings suggest that a lack of incentives discourages researchers from sharing data, a challenge also highlighted by Kiley, Peatfield, Hasan, and Reddington (2017). The study also identifies trust issues as a major concern, aligning with Espinosa, Kaisler, Armour, and Money (2019), who found that personal and institutional data

are vulnerable to privacy violations. Additional concerns include data mismanagement, the potential misuse of information, and the lack of protective policies for data sharing, findings supported by Alter and Vadigan (2015).

Conclusion

This study highlights the awareness, perception, challenges, and strategies related to research data management (RDM) among librarians in selected universities in Edo State. Findings reveal that while librarians exhibit a high level of awareness regarding RDM, its implementation remains in its infancy. Challenges such as inadequate funding, insufficient infrastructure, lack of skilled personnel, and copyright concerns hinder effective RDM adoption in academic libraries. Additionally, the reluctance of researchers to share data due to trust issues and the absence of clear institutional policies further complicate the process.

To address these challenges, it is essential for academic institutions to invest in RDM training programs, provide adequate funding, and develop policies that support data sharing and long-term preservation. Establishing institutional repositories and fostering collaboration between libraries and research communities will enhance the visibility and accessibility of research data. By implementing these strategies, academic libraries can effectively support researchers in managing, preserving, and sharing data, ultimately contributing to the advancement of knowledge and innovation.

Recommendations

1. Staff should be reskilled through seminars, and conferences
2. Funds should be made available to facilitate the implementation of RDM in academic libraries
3. Research data should be made visible in institutional repositories
4. Researchers should be given incentives
5. There should be implementation of policies that protects the types of data to be shared

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