

EXPLORING THE ROLE OF ONLINE LEARNING PLATFORMS IN ENHANCING DATA MANAGEMENT AND ANALYSIS SKILLS BY LIBRARIANS IN OSUN STATE

By

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Abstract

The growing importance of data-driven decision-making in library services has intensified the need for librarians to acquire advanced data management and analysis skills. This study explored available online learning platforms for librarians, and roles of these online learning platforms in enhancing such skills among librarians in Osun State, Nigeria. Using a descriptive survey design, data were collected from librarians in universities in Osun State through a structured questionnaire. The study population consisted of the 92 librarians in university libraries, and the census sampling technique was adopted for the study. The findings revealed that there are several online learning platforms available of librarians in Osun State; the platforms play significant roles in enhancing data management and analysis skills in the librarians. The study concludes that online learning platforms hold significant potential in bridging the skills gap if integrated into institutional training policies. It recommends practical methods for building data-literate librarians capable of meeting the demands of contemporary library services.

Keywords: Data analysis, Data management, Digital skills, Librarians, Online learning platforms

Introduction

In the era of digital transformation and data-driven decision-making, the role of librarians is rapidly evolving beyond traditional boundaries. Increasingly, librarians are expected to possess competencies in data management and data analysis to support research, institutional planning, and evidence-based services. Tenopir, et. al (2019) observes that with the explosion of digital information and the rising complexity of information systems, librarians must develop advanced skills in handling large datasets, metadata creation, data curation, visualization, and analytics tools. However, many library professionals, particularly in developing contexts, face such limitations as restricted access to formal trainings, time constraints, and budgetary shortages for professional development.

Online learning platforms have emerged as critical avenues for capacity building, and they offer flexible, on-demand, and often affordable training opportunities in key areas such as data literacy, statistical software (SPSS, R, Python, SAS), and research data management. Examples of these online learning platforms are Coursera, edX, LinkedIn Learning, and specialised library-focused platforms like WebJunction, and Library Juice Academy. Ifijeh and Yusuf (2020) averred that for librarians seeking to remain relevant and valuable in contemporary information ecosystems, leveraging these platforms becomes a practical and strategic move.

The adoption of online learning platforms allows for personalized learning trajectories and access to global best practices, thus reducing professional isolations. Moreover, librarians can gain certification that enhances their career mobility and institutional credibility. Despite these benefits, disparities in internet access, institutional support, and digital literacy continue to hinder the full utilization of such platforms by librarians in Nigeria. Thus, this study explores the online learning platforms available to librarians, how these online platforms enhance data management skills, and enhance data analysis skills.

Research Objectives

- i. To identify the online learning platforms available to librarians in Osun State;
- ii. To examine the role of online learning platforms in enhancing data management skills of librarians in Osun State;
- iii. To examine the role of online learning platforms in enhancing data analysis skills of librarians in Osun State;

Research Questions

- i. What are the online learning platforms available to librarians in Osun State?
- ii. How do online learning platforms enhance data management skills of librarians in Osun State?
- iii. How do online learning platforms enhance data analysis skills of librarians in Osun State?

Review of Related Literature

The 21st century contemporary demands that we go beyond traditional practices of teaching and learning and incorporate facilities with new genres of media and information technology (David-West 2022). Online learning platforms have emerged in response to the quest for a more accessible and affordable education. Pilli and Admiraal (2022) noted that these platforms provide Massive Open Online Courses (MOOCs), certificate programmes, and skill-specific modules, enabling learners to access contents globally. Means, Neisler and Langer, (2020) posited that the effectiveness of online platforms is largely dependent on institutional designs, emphasizing learner's autonomy, peer interaction, and reflective learning. Ejiwale (2021) averred that online learning platforms make access to education easier, even when disparities persist in digital infrastructure and digital competencies. Factors such as internet availability, ownership of devices, and linguistic barriers influence

learner's participation and performance.

Madhusudhan and Singh (2022) opined that these platforms support continuous professional development; as librarians use such platforms to enhance their competencies in digital literacy, data management, and services to users. For Xu and Xu (2023), a well-structured online learning experience can produce learning outcomes comparable to or better than traditional classroom settings. However, self-paced learning requires high levels of discipline. Martin, Polly and Ritzhaupt, (2020) reported that the COVID - 19 pandemic accelerated the adoption of online learning globally, as institutions are increasingly blending online and in-person instruction, known as hybrid or blended learning models.

Gamage, Perera and Fernando, (2022) investigated the impact of MOOCs on students' proficiency in spreadsheet management, data visualization, and basic database operations, reporting that over 72% of the participants have increased confidence in handling datasets and tools like Excel and SQL after completing targeted MOOCs. Nguyen, Linh and Zhang, (2021) conducted a quasi-experimental study to measure learning outcomes of professionals enrolled in a 6-week online course on data literacy, and reported significant improvement in participants' understanding of metadata, data cleaning techniques, and data ethics. Okiki and Asiru (2021) surveyed academic librarians in Nigerian universities who completed online courses on data curation and research data management; and the report indicated 65% of the respondents used acquired knowledge in library repositories and decision-making regarding metadata creation and file formats.

Also, Komba and Msuya (2023) examined Tanzanian information professionals' use of online training platforms, and showed a strong association between course participation and improved skills in managing bibliographic databases, using data storage tools, and interpreting usage metrics. Alharbi and Ahmad (2020) conducted a controlled experiment on graduate students undertaking online courses in data science, and found that course design and learner interactivity significantly affected knowledge retention and skill transfer. Despite these positive outcomes, Yilmaz and

Baydas (2022) reported that technical limitations, low internet bandwidth, and self-discipline issues among learners were persistent challenges.

Peltier, et. al (2021) revealed a statistically significant increase in learners' ability to clean, visualize, and interpret data, and higher confidence levels in applying programming techniques to solve real-world data problem. Abdelaziz, et. al (2022) showed an improvement in the ability to apply physical statistical tests and generate inferential insight, demonstrating that asynchronous learning can support practical skill acquisition even in resource-limited settings. Olanrewaju and Adebayo (2023) reported over 68% of respondents integrating new skills into their decision-making and reporting processes. Morris and Leone (2020) showed significant improvement in respondents' ability to interpret datasets related to public health.

Methodology

The research adopted the descriptive survey research design. The population of the study is the 92 librarians in the Universities in Osun State; and the research adopted a census sampling technique. The data gathering instrument adopted for the study was the questionnaire, hosted on Google Form, and the link was disseminated through WhatsApp and email groups to reach the target respondents. The instrument was validated for face and content validation by an expert librarian, before it was sent to the respondents. The data were analysed using statistical tools of tables and means, presented in Tables. The four (4) point Likert scale of measurement was adopted. The Criterion Mean is 2.5; hence the decision rule is that items with Mean values of 2.5 and above were accepted, while those with Mean values lesser than 2.5 were rejected.

Table 1 Research Population

University in Osun State	Ownership	Number of Librarians
Adeleke University, Osun State	Private	8

Bowen University, Osun State	Private	10
Fountain University, Osun State	Private	3
Joseph Ayo Babalola University, Osun State	Private	8
	Private	4
Kings University, Osun State	Federal	28
Obafemi Awolowo University, Osun State	Private	3
Oduduwa University, Osun State	Osun	9
Osun State University	Private	15
Redeemer's University, Osun State	Private	2
Trinity University, Osun State	Private	2
Westland University, Osun State		
Total		92

Presentation of Results

The results presented here are based on the responses from the respondents, who filled out the online questionnaire. A total of 85 of the respondents filled out the questionnaire, making it a response rate of 92.39%. These were analysed and presented herein.

SD: Strongly Agree; A: Agree; D: Disagree; SD: Strongly Disagree

Table 2: Online learning platforms available to librarians in Osun State

Available	Online	learning	SD	A	D	SD	Mean
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platforms					
Coursera	67	5	7	6	3.56
edX	63	7	4	11	3.44
Google Digital Skills for Africa	57	11	13	4	3.42
IFLA Webinars and eLearning	55	12	11	7	3.35
INASP – AuthorAID and Journals Online	35	17	19	14	2.86
	61	9	2	13	3.39
LinkedIn Learning	51	13	17	4	3.31
NLA e- Learning Portal	53	14	9	9	3.31
NOUN Learning Management System	41	31	5	8	3.24
OER Africa / Commonwealth of Learning	63	12	4	6	3.55
Udemy					
Average Mean					3.34
Criterion Mean = 2.5					
N = 85					

The table above showed that the online learning platforms used mainly by librarians in Osun State are Coursera, edX, Google Digital Skills for Africa, Udemy, LinkedIn Learning, IFLA Webinars and eLearning. And the Average Mean for all the platforms is 3.34, showing that the platforms are available for the librarians to access and utilise.

Table 3: Role of online learning platforms in enhancing data management skills of librarians in Osun State;

Role of Online Learning Platform on Data Management	SD	A	D	SD	Mean
Online learning platforms have improved my understanding of data management concept	64	13	6	2	3.64
Online learning platforms provide high-quality data management training relevant to librarianship	41	27	11	6	3.21
Online learning platforms are effective in improving my data management skills	64	9	7	5	3.55
The flexibility of online learning platforms support my data management skills	74	5	4	2	3.78
Online learning platforms improve my ability to manage library data	71	4	4	6	3.65
Online learning platforms foster self-directed learning and the acquisition of practical skills	72	7	3	1	3.72
Average Mean Criterion Mean = 2.5 N = 85					3.59

The table above showed that the roles played by online learning platforms in enhancing data management skills of librarians in Osun State are offering flexibility support, fostering self-directed learning and acquisition of practical skills, improvement of ability to manage library data, improved understanding of data management concept, and improvement of data management skills. The Average Mean for the roles of online learning platforms for enhancing data management skills of librarians is 3.59 which signifies that the above stated roles help in the enhancement of data

management skills of librarians in Osun State

Table 4: Role of online learning platforms in enhancing data analysis skills of librarians in Osun State

Role of Online Learning Platform on Data Analysis	SD	A	D	SD	Mean
Online learning platforms have improved my understanding of data analysis concept	61	17	2	5	3.58
Online learning platforms provide high-quality data analysis training relevant to librarianship	66	12	6	1	3.38
Online learning platforms are effective in improving my data analysis skills	57	12	5	11	3.35
The flexibility of online learning platforms support my data analysis skills	77	6	2	0	3.86
Online learning platforms improve my ability to analyse library data	72	7	4	2	3.75
Average Mean					3.58
Criterion Mean = 2.5					
N = 85					

The table above showed the roles played by online learning platforms in enhancing data analysis skills of librarians in Osun State. These are offering flexibility support, improved ability to analyse library data, improved understanding of data management concept, improved data analysis skills, provision of high-quality training, and improvement of data analysis skills. The Average Mean for the roles of online learning platforms for enhancing data analysis skills of librarians is 3.58 which signifies that the above stated

roles help in the enhancement of data management skills of librarians in Osun State

Discussion of Results

The findings from this study showed the available online learning platforms to librarians in Osun State. The findings reveal the availability of online learning platforms like Coursera, edX, LinkedIn Learning. The findings agree with Adebayo and Ojo (2023) who reported that Coursera and edX remain popular among Nigerian librarians for their robust university-affiliated contents and certification opportunities, as these platforms offer structured learning. Their credibility and flexibility have made them particularly attractive to librarians seeking globally recognised credentials; also noting that Udemy and LinkedIn Learning are valued for their practical, modular courses, especially on software tools such as Microsoft Excel, SPSS, and R, which are crucial for data analysis in academic libraries. The research findings also revealed a significant awareness and access gap; and this corroborates Ezeani and Ugwu (2022) who reported that many librarians were either unaware of the existence of several online learning platforms or they lacked the digital literacy skills to utilise them effectively.

The findings from this study underscore the role of online learning platforms in enhancing the data management skills of librarians. A key finding is the perceived flexibility of online learning platforms, which allows librarians to learn at their own pace and convenience. This factor significantly contributes to increased participation in online data management courses, particularly among librarians in academic and research institutions who are balancing multiple responsibilities. This aligns with earlier studies by and Ifijeh and Yusuf (2021), which demonstrated a growing reliance on digital tools for continuous professional development among information professionals. The study also revealed that online platforms foster self-directed learning and the acquisition of practical data handling skills through interactive tutorials, case studies, and hands-on projects. These outcomes support the assertions of Adebayo and Ojo (2023), who emphasized the pedagogical strengths of online platforms in fostering practical ICT-related skills.

The findings of this study underscore the significant role online learning platforms play in enhancing the data analysis skills of librarians. The results align with the growing body of literature suggesting that digital platforms offer flexible, scalable, and relevant learning opportunities for information professionals in the era of data-driven decision-making (Ifijeh & Yusuf, 2020; Tenopir, et. al., 2022). The findings also corroborate those of Akers and Doty (2013), which emphasized that librarians require continuous training to handle large datasets and support research data services effectively.

Conclusion

This study has exposed the vital role that online learning platforms play in enhancing the data management and analysis competencies of librarians in Osun State. Findings reveal that platforms such as Coursera, edX, Udemy, and LinkedIn Learning have significantly contributed to professional development by providing accessible, flexible, and up-to-date training on data-related skills. Librarians who engage with these platforms demonstrate improved proficiency in handling, analysing, and interpreting data, which are skills essential in the digital information age.

The study concludes that sustained adoption and institutional endorsement of online learning can further empower librarians to meet the evolving demands of information service delivery. Therefore, academic libraries in Osun State are encouraged to integrate online learning into their staff development frameworks, while policymakers should facilitate improved digital infrastructure and awareness campaigns to support continuous learning.

Recommendations

Based on the findings and conclusion, the following recommendations are made:

- i. Government bodies and library management in Osun State should formally integrate credible online learning platforms into their staff development programmes to ensure continuous up-skilling in data

management and analysis. This can be achieved by ensuring that librarians have access to reliable internet connectivity, digital devices, and subscription-based online platforms to support their learning experience.

- ii. Institutions should organize periodic workshops and hands-on training for librarians that incorporate content from online learning modules, and complete certified courses in data management and analysis.
- iii. Library associations such as the Nigerian Library Association (NLA) should partner with international educational platforms to provide subsidized or customized training tailored to the data management and analysis needs of librarians in Nigeria.

References

- Abdelaziz, H. A., El- Gendy, R. A. and Soliman, M. M. (2022). Enhancing educators' data analysis competencies through online platforms: A case study in Egypt. *International Journal of Educational Technology in Higher Education*, 19(1), 1–18. <https://doi.org/10.1186/s41239-022-00325-5>
- Adebayo, S. O. and Ojo, R. A. (2023). Digital upskilling for academic librarians in Nigeria: Prospects and challenges. *Journal of Library and Information Science*, 15(1), 45–58.
- Akers, K. G. and Doty, J. (2013). Research data management practices and perspectives of librarians at research institutions. *Journal of the Medical Library Association*, 101(1), 56–62. <https://doi.org/10.3163/1536-5050.1011009>
- Alharbi, S. and Ahmad, K. (2020). Impact of interactive e-learning tools on student learning in data management courses. *International Journal of Information and Education Technology*, 10(4), 278–284. <https://doi.org/10.18178/ijiet.2020.10.4.1371>
- David-West, B.T. (2022). Digital literacy skills and utilization of online

- platforms for teaching by LIS educators in Universities in Rivers State, Nigeria. *International Journal of Knowledge Content Development & Technology*, 22 (4), 105- 117.
- Ejiwale, J. A. (2021). Bridging the digital divide: The role of online education in developing countries. *International Journal of Education and Development using Information and Communication Technology*, 17(2), 142–153. <https://ijedict.dec.uwi.edu/viewarticle.php?id=3089>
- Ezeani, C. N. and Ugwu, C. I. (2022). Open access educational platforms and their utilization among academic librarians in South-East Nigeria. *Library Philosophy and Practice*. <https://digitalcommons.unl.edu/libphilprac/7500>
- Gamage, D., Perera, I. and Fernando, S. (2022). Evaluating the effectiveness of MOOCs in teaching data analysis tools to undergraduates. *Education and Information Technologies*, 27(1), 233–248. <https://doi.org/10.1007/s10639-021-10697-0>
- Ifijeh, G. and Yusuf, F. (2020). Digital literacy in 21st century libraries: The role of librarians in bridging the digital divide. *Library Philosophy and Practice*, 1–15. <https://digitalcommons.unl.edu/libphilprac/3878>
- Komba, M. M. and Msuya, J. (2023). Digital learning for digital librarians: An evaluation of online training for data management skills in Tanzania. *Journal of Information Science and Technology*, 45(2), 87–104.
- Madhusudhan, M. and Singh, H. (2022). Upskilling library professionals in India through MOOCs: Opportunities and challenges. *Digital Library Perspectives*, 38(1), 84–97. <https://doi.org/10.1108/DLP-09-2021-0074>
- Martin, F., Polly, D. and Ritzhaupt, A. D. (2020). Bichronous online learning: Blending asynchronous and synchronous online learning. *EDUCAUSE Review*. <https://er.educause.edu/articles/2020/10/bichronous-online-learning>

- Means, B., Neisler, J. and Langer Research Associates. (2020). *Remote learning during COVID- 19: Lessons from today, principles for tomorrow*. Digital Promise. <https://digitalpromise.org>
- Morris, T. R. and Leone, L (2020). Impact of online data analysis training on public health professionals: A quasi-experimental study. *Journal of Public Health Informatics*, 12(2), e45–e52.
- Nguyen, T., Linh, T. and Zhang, Y. (2021). Improving data literacy through online learning: A case study from a professional development initiative. *International Journal of Educational Technology in Higher Education*, 18(1), 45. <https://doi.org/10.1186/s41239-021-00278-4>
- Okiki, O. C. and Asiru, M. A. (2021). Online learning for library staff development in Nigerian universities: A focus on data management training. *Library Philosophy and Practice (e-journal)*, 5729. <https://digitalcommons.unl.edu/libphilprac/5729>
- Olanrewaju, R. A. and Adebayo, T. R. (2023). Developing data analytic skills among Nigerian librarians through online learning platforms. *Library Philosophy and Practice (e-journal)*, 7823. <https://digitalcommons.unl.edu/libphilprac/7823>
- Peltier, J. W., Scovotti, C. and Pointer, L (2021). Enhancing data analysis skills through online learning: A randomized field experiment. *Decision Sciences Journal of Innovative Education*, 19(1), 89–104. <https://doi.org/10.1111/dsji.12199>
- Pilli, O. and Admiraal, W. (2022). Student engagement in MOOCs: A systematic literature review. *International Review of Research in Open and Distributed Learning*, 23(2), 1–19. <https://doi.org/10.19173/irrodl.v23i2.5779>
- Tenopir, C., Sandusky, R. J., Allard, S. and Birch, B. (2019). Research data services in academic libraries: Data intensive roles for the future. *Journal of eScience Librarianship*, 8(1), e162. <https://doi.org/10.7191/jeslib.2019.1162>
- Tenopir, C., Sandusky, R. J., Allard, S. and Birch, B. (2022). Data services in

- academic libraries: A survey. *College & Research Libraries*, 83(2), 189–205. <https://doi.org/10.5860/crl.83.2.189>
- Xu, D. and Xu, Y. (2023). The promises and limitations of online higher education: A meta- analysis of randomised controlled trials. *Educational Research Review*, 38, 100511. <https://doi.org/10.1016/j.edurev.2022.100511>
- Yilmaz, R. M.and Baydas, O. (2022). Exploring barriers to effective online data management training in low-resource settings. *Turkish Online Journal of Distance Education*, 23(2), 70–85. <https://doi.org/10.17718/tojde.1132841>