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Does the Type of Open Access Matter in Research Impact in Sub-Saharan Africa? An Informetric Study, 2012-2021

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Abstract

This study examines the publication pattern of open access (OA) and paywalled scholarly works, determines the citations and views impact of publications published through the different forms of OA, and disaggregates the scholarly outputs and impact across the different types of OA in sub-Saharan African countries, in order to assess whether the types of OA matter in research impact in sub-Saharan Africa. Data from the SciVal database, utilising bibliographic, citation, and views data drawn from Scopus, formed the foundation of this study. The research scope encompassed documents published over a decade, from 2012 to 2021. Research output, quantified as the number of publications (papers), constituted the primary focus, while citation-based and views-based metrics were utilised as proxies for measuring research impact. The findings underscore a steady rise in OA scholarly publications, indicating a growing inclination and uptake of OA scholarship within sub-Saharan African nations. Across most sub-Saharan African countries, OA publications comprised over 50% of the total publications. The study discerns a preference hierarchy for OA models: Green OA emerged as the foremost choice, trailed by Gold OA, and Bronze OA, while Hybrid-Gold OA registered as the least favoured model. Notably, publication counts exhibited robust associations with citation and viewing figures, displaying varying strengths in correlation with other citation and viewing metrics.

Keywords: Open Access, Sub-Saharan Africa, Informetric, Scholarly Publishing.

Introduction and Problem Statement

Open access (OA) publishing is undoubtedly transforming the way researchers now disseminate their findings (Else, 2018). The OA movement gained momentum in the early part of the 21st Century with the signing of the Budapest Open Access Initiative (BOAI) in 2002 (BOAI, 2002). This marked a major milestone in the history of OA. The BOAI defined OA as we know it today as the unrestricted availability of research publications on the Internet thereby enabling interested persons to read, copy, download, or share the publications (BOAI, 2002). The BOAI also rallied together the key stakeholders in the scholarly communication landscape to support

the OA movement. These included representatives of researchers, publishers, professional associations, universities, librarians, research foundations, and diverse OA advocacy groups. The fundamental principle of the BOAI is to equalise access and use of scholarly materials by reducing or removing access barriers to the research literature through the establishment of self-archiving platforms and OA journals. Besides the BOAI, the Bethesda Statement on OA publishing was made in April 2003 to explore strategies for enhancing access to primary biomedical research literature (Bethesda Statement on OA Publishing, 2003). This was followed by the Berlin Declaration in October 2003 to promote access to research knowledge in the humanities (Borges, 2008). Beyond the need to open up access to scholarly materials, the OA movement was also motivated by the publishing opportunities created by the emerging technologies exemplified by the Internet. It is argued that the emergence of the World Wide Web (WWW) and the portable document format (PDF) attracted scholars and publishers to online spaces (Rempel, 2022) giving rise to the emergence of scholar-led publishing. The main aim of the scholar-led publishers was not only economic but also to disseminate their own research using the emerging techno-based platforms. These scholar-led publishers positioned themselves as the transparent channel for scholarly communication as opposed to the expensive and exploitative proprietary publishers (Moore, 2020). Chan (2004) asserted that OA publishing is a scholars' move to take control of the dissemination of their works and maximise the readership of their scholarly works. OA is a means of democratising the scholarly communication landscape and opening it up for the benefit of researchers and the public (Panda, 2020).

OA publishing has gained popularity globally as an alternative to commercial academic publishing (Moore, 2020). This is reflected in the increasing uptake of and growing advocacy to promote OA publication channels (Wei, 2020). For instance, there is a policy-driven campaign to increase the proportion of OA publications in academic library collections as a means of taming the skyrocketing subscription costs (Gaind, 2019). The growing acceptance of OA publishing is also evident in the increasing number of OA repositories indexed in the Registry of OA Repositories (ROAR) and OA journals listed in the Directory of OA Journals (DOAJ) (Nestor et al., 2020). Funding for OA publishing can also be a metric for assessing the acceptance of OA publishing. In this case, an analysis of funding opportunities and volumes would demonstrate the extent to which OA has been accepted as a scholarly communication channel (Morillo, 2020). Resistance to commercial publishing exemplified by the emergence of illegal platforms, such as Sci-Hub, to circumvent paywalls and open up access to scholarly materials also emerged (Meagher, 2021). Similarly, legal efforts to help users of research locate OA versions of publications, such as the OA Button, have also been developed. The popularity and acceptance of OA are also evidenced by the growing inclusion of OA journals by renowned indexing and abstracting service providers such as the Web of Science and Scopus (Dodds, 2019).

Most of the scholars and libraries in the Global South, including sub-Saharan Africa, face the gravest challenges in accessing global knowledge (Christian, 2008). OA publishing, therefore, offers a great opportunity for these scholars to maximise access, readership, and uptake of existing knowledge. Whereas most of the literature on OA publishing in developing countries focuses on promoting this scholarly communication channel, little is known about the types of OA publishing that hold the optimal potential for scholars in the Global South. Equally important is the influence of the types of OA publishing on enhancing the impact of research. As a result, the research questions in this study are: does the type of OA publishing matter in research impact in sub-Saharan Africa? How much impact is generated through each type of OA in the region? Is there a preferred type of OA in sub-Saharan African countries? Sub-Saharan Africa has long grappled with limited access to global knowledge due to various barriers, hindering impactful research and scholarly communication (Bwalya and Akakandelwa 2021). The emergence of OA publishing represents a transformative opportunity for scholars in this region, offering a pathway to circumvent access constraints and amplify readership and utilisation of existing knowledge resources. Moreover, while discussions on OA in sub-Saharan Africa often revolve around its promotion (Ondari-Okemwa, 2007; Bakuya, 2014), a critical gap exists in understanding the nuanced impacts of different types of OA

publishing in the region. Exploring the influence of OA types on research impact in sub-Saharan Africa can offer invaluable insights into optimising this scholarly communication channel for maximal benefit. Additionally, the heightened attention OA has garnered among scholars, funders, and governments in sub-Saharan Africa underscores its strategic importance. The increasing demands from funders and research institutions for OA publishing underscore its growing relevance and recognition as a crucial component of scholarly dissemination in the region and worldwide. Finally, several countries in sub-Saharan Africa are formulating policies regarding OA publishing (Bwalya and Akakandelwa 2021), and therefore, the findings of this study will serve as a pivotal foundation upon which discussions and decisions surrounding OA-related policies can be shaped, offering empirical insights crucial for policy formulation and strategic planning within the region's academic and research landscape.

Purpose of the Study

The purpose of the study was to examine the research impact associated with the different types of OA in an attempt to answer the main research question: does the type of OA matter in research impact? The study specifically assessed the trend of publication of research through OA, the proportion of OA and paywall publications, and the influence of OA publishing on the impact of research in the four OA types, the number of publications, using citations- and views-based metrics as variables.

OA Publishing in Sub-Saharan Africa: A Brief Literature Review

The upward trend in freely accessible, online OA publishing, driven by the WWW era (Gargouri et al., 2010; Piwowar et al., 2018; Robinson-Garcia et al., 2020), has significantly enhanced global research dissemination. Despite this growth, scholars in Sub-Saharan Africa face challenges accessing OA literature (Iyandemye and Thomas, 2019). OA models, sometimes referred to as routes, include Gold OA (exclusively in OA journals), Hybrid-Gold OA (offering OA publishing choice), Bronze OA (alternative free-to-read versions with or without specific licenses), and Green OA (depositing the published version or manuscript in a free-to-read repository) (see Moya-Anegón, Guerrero-Bote and Herrán-Páez 2020; Scopus, 2022).

Sub-Saharan Africa has a rich academic landscape with diverse research contributions. However, the global visibility of these contributions is often hindered by restricted access, limited resources, institutional barriers, and subscription costs to research publications (Ondari-Okemwa, 2007; Bakuya, 2014) Ajibade and Muchaonyerwa (2023) observe that "information technology infrastructure, Internet connectivity, platform agility and institutional governance remain significant challenges to OA publishing on the African continent." Furthermore, differences in OA uptake levels between countries vary due to other factors such as financial policies, research profiles, national OA policies, access to expensive subscription journals, and higher publication fees (Wang et al., 2014; Matheka et al., 2014; Houghton and Sheehan, 2009). Bakuwa --(2014) observed that sub-Saharan Africa's low uptake of OA may be associated with few African journals indexed by ISI Web of Science. This contributes to sub-Saharan African countries' poor showing on the global map as reflected by the number of recipients of Nobel Prize awards, as well as position and number of African universities on world university rankings.

Siyao et al. (2017) explored the role of libraries in promoting open science in four sub-Saharan African countries, namely Ghana, Nigeria, Tanzania, and Uganda, using a multi-case study research design. The study revealed a scarcity of scholarly journals available in OA for most African academic institutions in the mentioned countries. The authors recommended a heightened emphasis on open science advocacy within academic libraries in Sub-Saharan Africa. Building on this theme, Asare, et al. (2021) conducted a bibliometric analysis of 1,858 peer-reviewed articles published between 2010 and 2018 by researchers based in sub-Saharan Africa. They evaluated the prevalence of OA publishing in educational publications from the region. While they observed a consistent rise in OA publishing between 2010 and 2018, the proportion of OA publications remained relatively low. This was attributed to the high processing fees associated with OA in reputable journals, prompting many authors in sub-Saharan Africa to choose pay-walled, higher-quality journals over lower-quality OA journals. However, Bwalya

and Akakandelwa (2021) expressed an optimistic view, noting a positive transformation in the OA landscape with the rise of OA publishing initiatives and platforms in Sub-Saharan Africa such as African Journals Online (AJOL), Africa Academy of Sciences (AAS) Open Research, and Scientific African.

Simard et al. (2022) provided a global perspective of OA adoption by countries using indicators such as publications in OA and references to OA articles. Their findings revealed that sub-Saharan Africa exhibited a higher rate of publishing and citing OA compared to high-income countries, with a notable preference for both green and gold OA. The study attributed this trend to the waiver of Article Processing Charges (APCs) for low-income countries, emphasising the need for more OA initiatives at various levels to foster broader adoption of open scholarship. In contrast, Robinson-Garcia et al. (2020) conducted a worldwide study on OA adoption, analysing universities listed in the 2019 edition of the Leiden Ranking. Their research classified OA publications into four types: gold, green, hybrid, and bronze. About 41% of all publications in their dataset were OA, with Green OA being the most prevalent, followed by Gold OA, Bronze OA, and Hybrid OA. The study noted variations in OA uptake at the continental level, with Europe leading, North America following, and Asia and Africa lagging behind. In Africa, South Africa, a country in sub-Saharan Africa, exhibited high levels of OA. Moreover, Verma and Sonkar (2021) compared OA performance in BRICS countries (Brazil, Russia, India, China, and South Africa) from 2011 to 2020, drawing data from the Scopus database. Their findings indicated that South Africa, being in Sub-Saharan Africa, contributed less to OA scholarly publications (5% in 2011–2020) compared to other BRICS nations, underscoring the need for context-specific considerations in evaluating OA performance across different regions.

Methods and Materials

The study adopted informetrics to assess the impact of the publications in the four different types of OA, namely Bronze OA, Gold OA, Green OA and Hybrid-Gold OA. Informetrics is defined as the quantitative assessment of patterns that show up in information, right from information production to use (Diodato,1994). Informetrics is commonly used to assess research production, dissemination, use and impact (Onyancha, 2020b). The current study obtained its data from SciVal, a research performance assessment tool that allows analysis of data indexed in the Scopus bibliographic and citation database. Scopus is one of the largest and most commonly used to assess the research performance of researchers, institutions and countries using a variety of research metrics and units of analysis. It is the preferred data source for bibliometric analyses of African research despite its limitations associated with coverage of publications and journals from developing countries (Boshoff and Akanmu 2017). Boshoff and Akanmu (2017) and several other scholars note that the constraints present in Scopus are less conspicuous when compared to the citation indexes found in the Web of Science (WoS). Scopus' constraints, like those inherent in other citation databases, are associated with database errors, assignment of journals to wrong field categories, and search algorithms, among others (Boshoff and Akanmu 2017). The constraints inherent in SciVal stem from the limitations inherent in the Scopus database, which serves as the primary data source for Scival's analytics and metrics.

This study focused on publications (herein interchangeably used with papers) as a unit of analysis using two broad indicators of research performance, namely scholarly output, on the one hand, and publications impact, on the other hand. Data was extracted from SciVal between 8 and 12 March 2023. SciVal provides several search options to extract data. Depending on the purpose of the study, one can search for and extract relevant data using any one of the following options/fields: institutions and groups; researchers and groups; publication sets; countries, regions and groups; topics and clusters; and research areas. This study searched within the 'countries, regions, and groups of countries/regions', using the names of countries in sub-Saharan Africa, to obtain the scholarly outputs and impact of papers published by each of the countries in sub-Saharan Africa. The search for relevant data using the names of countries was informed by the fact that SciVal has not aggregated the publications under 'sub-Saharan Africa', hence the search and extraction of the data using names of individual countries that comprise sub-

Saharan Africa.

The specific metrics that we found relevant to the study and therefore extracted from SciVal included the number of papers, number of citations, field-weighted citation impact, average citations per paper, number of views, field-weighted views impact, and average views per paper for each type of OA in each country (see Appendix A and Appendix B). Below is a definition of each of the aforementioned metrics:

- Scholarly outputs (number of publications) (P): the total number of papers published in a country, either through OA or paywall model.
- Citations (C): Citations counts in SciVal reflect the total number of citations received from the time an item was published, up to the date of the last data cut
- Field-Weighted Citation Impact (FWCI): FWCI in SciVal indicates how the number of citations received by an entity's publications compares with the average number of citations received by all other similar publications in the data universe: it is used to compare the citations received by an entity's publications with the world average.
- Citations per paper (C/p): number of citations divided by the number of papers published in an entity or a subject domain.
- Views (V): V indicates the total usage impact of an entity – the total views that an entity's (field, organisation, country, author or even a publication) publication has received.
- Field-Weighted Views Impact (FWVI): FWVI indicates how the number of views received by an entity's publications compares with the average number of views received by all other similar publications in the same data universe; it is used to compare the views received by an entity's publications with the world average.
- Views per paper (V/p): number of views divided by the number of papers published in an entity or a subject domain.

The quantification of publications attributed to each country and OA model, as presented in Appendix A and Appendix B, was accomplished using the complete count method, also referred to as the whole or normal count of publications. As Diodato (1994) and Onyancha (2013) detailed, this method mandates the full inclusion of each country or OA model, irrespective of publications associated with multiple countries or OA models. For instance, in cases where a publication was classified under Gold OA and Hybrid-Gold OA, each respective OA model was counted once in order to maintain a full paper allocation for each country and OA model. Once the data was extracted from SciVal, they were saved in Excel format files. We employed multiple analytical methodologies for data examination. Initially, a trend analysis was conducted to delineate the trajectory of OA publications in sub-Saharan African nations. Subsequently, descriptive statistics were used to compare the scholarly output and impact of OA and non-OA (NOA) research. Furthermore, we performed Pearson Correlation tests and regression analyses via IBM's Statistical Package for Social Sciences (SPSS). These tests aimed to scrutinise the association between scholarly publications within each OA classification and the impact concerning citations and views. Pearson's correlation coefficient, denoted as Pearson's r, quantifies the strength and direction of a linear relationship between continuous variables (Rumsey 2011). An r value of 1 signifies a perfect positive linear relationship, indicating that as one variable increases, the other proportionally increases, while -1 indicates a perfect negative linear relationship. Additionally, regression analysis, a statistical tool, explores how one dependent variable is influenced or forecasted by one or more independent variables (Rumsey 2011).

Results and Discussion

This section presents and discusses the findings with respect to the trend of OA vis-à-vis the non-OA publications; a comparison of OA and NOA scholarly outputs and their citation and views impact; and the scholarly outputs and impact per the type of OA.

Trend of publication of OA and NOA publications in sub-Saharan Africa, 2012-2021

Figure 1 provides the trend of OA and non-OA (NOA) publications in sub-Saharan African countries from 2012 to 2021, both years inclusive.

The OA publications encompassed works identified and designated by Scopus as Gold OA, Green OA, Bronze OA, or Hybrid-Gold OA (see Scopus 2022), whereas the non-OA publications included all works not classified under the OA categories. The Figure reveals that both the OA and NOA publications have continued to increase over time with the OA publications growing faster than NOA publications. By 2012, the number of OA papers stood at 268 while the NOA publications were 487 per country, a difference of approximately 82%, or 219 publications per country. This trend of growth continued with OA publications closing the gap each year until 2017, after which the number of OA publications per country surpassed the NOA publications. Since then, sub-Saharan Africa has reported more OA publications than NOA publications until 2021 when the average number of papers was 1195 and 784 for OA and NOA, respectively. The OA publications had, therefore, overtaken the NOA publications by 411 publications, accounting for a 52% difference.

This pattern of growth of OA publications was reported by Piwowar *et al.* (2018) who noted that OA publications accounted for only 28% of the total number of publications published prior 2015. The authors, however, hastened to add that the proportion of OA publications was rapidly growing, driven particularly by growth in Gold OA and Hybrid-Gold OA. Indeed, several other scholars have noted that the number of OA publications has continued to increase (see (Archambault *et al.,* 2013; Chen 2013; Gargouri *et al.*, 2012; Laakso *et al.*, 2011; Laakso and Björk, 2012). It is worth noting that all the aforementioned studies were conducted and used data that was available by or before 2018 when the number of OA publications surpassed the NOA publications in the current study. But, (Piwowar *et al*., 2018) had noticed that although the number of OA publications comprised 28%, those published in 2015 accounted for approximately 50% of all the publications they analysed in that one year in their study.

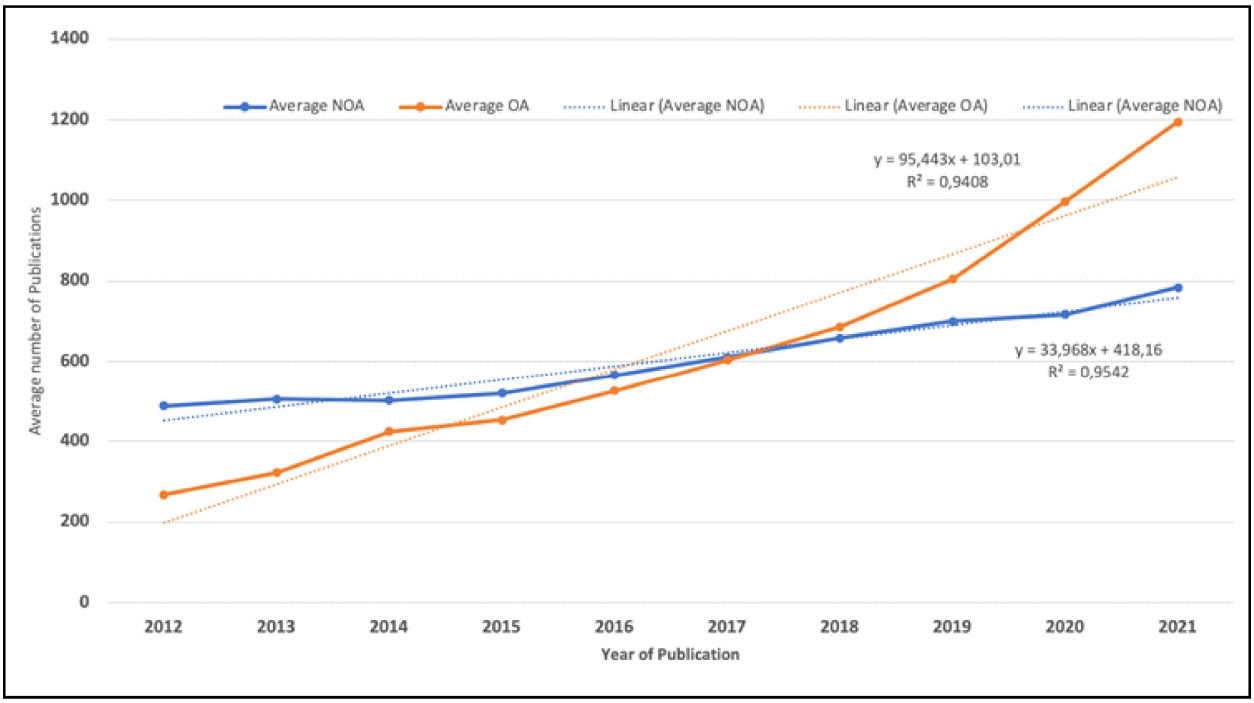

Figure 1: Trend of OA and NOA publications in sub-Saharan Africa, 2012-2021

An examination of the trend of OA publications according to the OA types or routes in Figure 2 shows that while the number of papers per country has continued to increase, the Green OA has remained the dominant OA route throughout the period of study. The average number of Gold OA publications surpassed the Hybrid-Gold OA publications in 2015 and has remained above the latter group of publications until 2021. It was further noted that the Bronze OA publications have remained at the bottom throughout the study period, having recorded only 34 publications in 2012 and 74 publications in 2021, a percentage increase of 118%. Comparatively, the Gold OA publications grew by 553%, while Green OA and the Hybrid OA publications registered a growth rate of 356% and 190%, respectively, between 2012 and 2021.

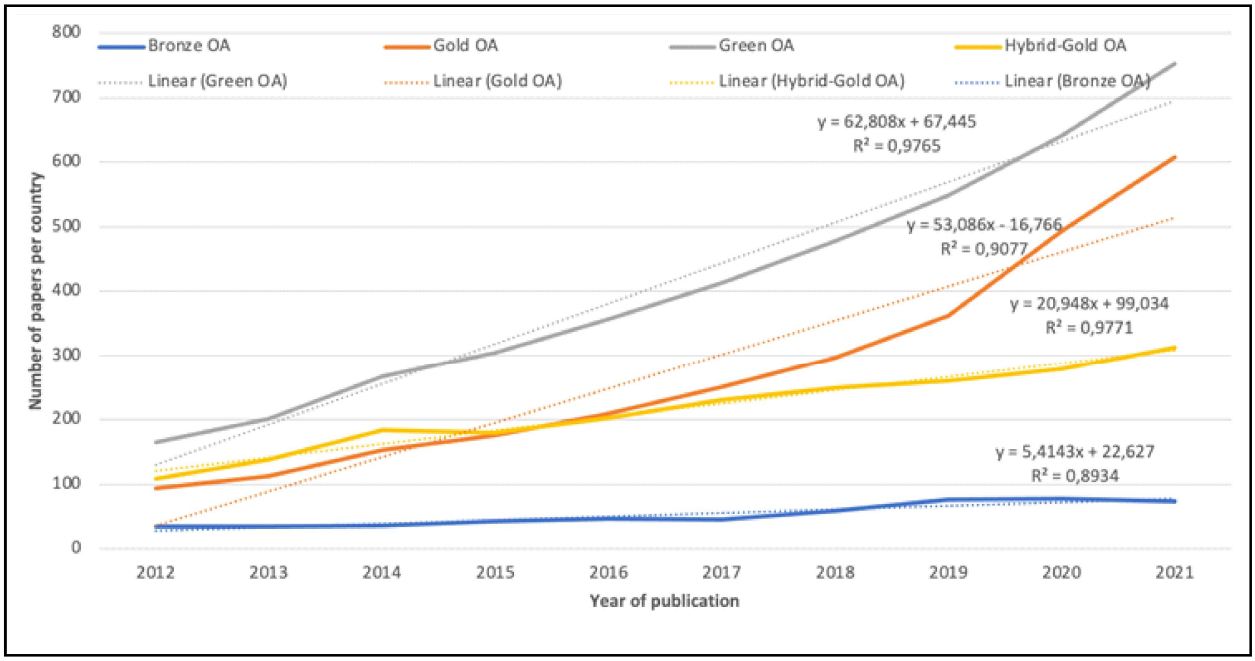

Figure 2: Trend of publications of OA publications according to OA route, 2012-2021

Table 1: Descriptive statistics with respect to the open and non-OA publications

		Mean	Median	Range	Minimum	Maximum
Non-OA	Number of Papers	6049,84	935	132255	25	132280
	Number of Citations	60916,92	8156	1438754	188	1438942
	Field-Weighted Citation Impact	0,82	0,8	1,04	0,43	1,47
	Citation per Paper	10,37	10,3	16,8	5	21,8
	Views	141708,88	18071	3209857	613	3210470
	Views per Paper	23,07	22,7	19,5	16,4	35,9
	Field-Weighted Views Impact	0,96	0,94	0,75	0,73	1,48
OA	Number of Papers	6146,27	1421	115114	41	115155
	Number of Citations	139938,76	34956	2516857	554	2517411
	Field-Weighted Citation Impact	2,06	1,73	4,76	0,87	5,63
	Citation per Paper	26,07	22,9	57,1	10,2	67,3
	Views	208854,88	60471	3713880	2152	3716032
	Views per Paper	40,24	32,4	104,6	18,6	123,2
	Field-Weighted Views Impact	1,99	1,63	4,27	0,91	5,18

Overall, sub-Saharan Africa published more than 50% of its publications through one or more of the OA models. Table 2 indicates that the region produced 6146.27 publications per country on OA while pay-walled publications numbered 6049.84 per country. Similarly, Appendix B shows that all but 10 countries in sub-Saharan African countries recorded more OA than pay-walled publications. The exceptions where the number of OA publications accounted for less than 50% of a country's total number of publications included Botswana (44.04%), Djibouti (43.49%), Lesotho (49.43%), Mauritania (48.82%), Mauritius (31.11%), Namibia (46.23%), Nigeria (41.84%), South Africa (46.54%), Sudan (43.48%), and Togo (49.17%). All the other countries except Uganda (OA = 50.00%) yielded more OA than NOA publications. The top 10 countries in which OA constituted the biggest share of a given country's total number of publications were: The Gambia (n = 1647, 84.33%), Guinea-Bissau (n = 397, 72.45%), Malawi (n = 5363, 71.55%), Liberia (n = 555, 70.08%), Sierra Leone (n = 1055, 70.05%), Equatorial Guinea (n = 126, 69.23%), Mozambique (n = 3103, 68.64%), Mali (n = 1995, 68.09%), Zambia (n = 4242, 67.90%), and South Sudan (n = 153, 67.70%).

Table 1 further shows that not only do researchers in sub-Saharan Africa publish more OA than NOA publications but also that the OA publications generate a superior impact than their counterparts. All the OA impact metrics recorded higher average impact scores (i.e., means) per country than NOA impact metrics in terms of the number of citations (C), field-weighted citation impact (FWCI), citations per paper (C/p), number of views (V), views per paper (V/p), and field-weighted views impact (FWVI). This scenario is not unique to sub-Saharan Africa; it is a worldwide occurrence as many studies have demonstrated (see Archambault et al 2016; Piwowar et al 2018). Whether this pattern is similar across all types of OA was the subject of this paper.

Impact of Publications Based on the Types OA

The impact of research is assessed using traditional metrics (citation-based metrics) and alternative metrics (simply referred to as Altmetrics) (see Akella et al. 2021; Onyancha 2020b). Despite their limitations (see Shakeel et al. 2022), citation-based metrics and Altmetrics (including the publication views) have been extensively used to measure the impact of research. To answer the question 'Does the type of OA have a bearing on research impact?', we first examined the OA scholarly outputs, on the one hand, and citations and views, on the other hand, as a percentage share of all OA publications and impact, respectively, for each of the OA models (see Table 2). Second, we subjected the publications and citation metrics in each of the OA models to analysis using descriptive statistics, correlation and regression analyses to examine any relationships between the two sets of variables (see Table 3 and Table 4; and Figure 3 and Figure 4).

Table 2: Performance of each type of OA relative to all OA publications in sub-Saharan Africa

	Papers		Citations			Views		
	n	%	n	%	C/p	n	%	V/p
Bronze	42596	8,87	884095	7,73	20,76	1150024	6,83	27,00
Gold	175157	36,49	2413520	21,09	13,78	4146400	24,62	23,67
Green	229793	47,87	6382003	55,78	27,77	8909889	52,91	38,77
Hybrid-Gold	32532	6,78	1761741	15,40	54,15	2632744	15,63	80,93
TOTAL (N)	480078	100,00	11441359	100,00	23,83	16839057	100,00	35,08

Table 2 provides the number of papers, citations and views in each type of OA, together with the corresponding percentage share of the total number of OA publications, citations, and views. As explained in the methodology, the whole count approach was used to quantify publications, citations, and views in each type of OA as well as in the computation of the TOTAL (N) figures in the last row in Table 2. Regarding the scholarly outputs, Table 2 shows that Gold OA and Green OA yielded the highest number of publications, accounting for 84% of the total number of OA publications. The Green OA publications constituted the most (47.87%) followed by Gold OA (36.49%), while the other two types of OA, Bronze OA and Hybrid-Gold OA, accounted for approximately 16% of the OA publications in sub-Saharan Africa. In terms of citations and views, Gold OA and Green OA contributed higher figures than Bronze OA and Hybrid-Gold OA, with Green OA yielding 55.78% of the citations and 52.91% of the views. The Hybrid-Gold OA publications, however, were the most impactful in terms of the average number of citations (i.e., 54.15) and views per paper (i.e., 80.93). These results suggest the preference of Gold OA and Green OA publishing in sub-Saharan Africa, similar to the findings of Piwowar *et al.* (2018). This preference, evident from the substantial percentage shares in scholarly outputs, showcases a strategic utilisation of these OA models. Green OA, constituting the largest share in publications, reflects an active engagement of scholars in leveraging repositories and self-archiving practices. Similarly, the significant presence of Gold OA signifies a proactive approach to publishing in open-access journals. The dominance of Green OA and Gold OA aligns with the overarching goal of enhancing accessibility to scholarly work within sub-Saharan Africa. This may be attributed to the co-authorship behavior of publications. Impact-wise, the Green OA publications accounted for 55.78% of all the citations and 52.91% of the views generated by the publications, thereby signaling the dominance of the Green OA model over the other models of OA in sub-Saharan Africa. However, it was the Hybrid-Gold that yielded superior average citations and views per paper, despite yielding the lowest number of scholarly outputs.

Table 3: Descriptive statistics of scholarly output and impact of Bronze, Gold, Green, and Hybrid-Gold OA publications in sub-Saharan Africa, 2012-2021

		Number of Papers	Number of Citations	Field-Weighted Citation Impact	Citations per paper	Number of Views	Views per Paper	Field-Weighted Views Impact
Bronze	Mean	869,31	18042,76	1,47	18,61	23469,88	27,33	1,34
	Median	194	5003	1,28	18	6996	26,2	1,22
	Range	17137	425360	4,54	43,2	487444	28,2	1,99
	Min	4	19	0,43	4,8	65	15,8	0,68
	Max	17141	425379	4,97	48	487509	44	2,67
Gold	Mean	3574,63	49255,51	34,31	14,06	84620,41	25,13	1,15
	Median	885	12963	1,08	14	19095	23,3	1,09
	Range	57422	801881,09	1628,23	14,2	1509548	78	2,87
	Min	22	0,91	0,77	9,2	1294	16,5	0,8
	Max	57444	801882	1629	23,4	1510842	94,5	3,67
Green	Mean	4689,65	130244,96	2,36	30,67	181834,47	45,06	2,24
	Median	1165	33516	2,09	26,3	48701	38,1	1,88
	Range	85117	2225318	5,28	62,3	3095421	117,4	4,88
	Min	32	529	1,08	12,6	1857	20,2	0,92
	Max	85149	2225847	6,36	74,9	3097278	137,6	5,8
Hybrid-Gold	Mean	663,92	35953,90	7,71	92,07	53729,47	131,87	7,31
	Median	144	10182	4,15	52,5	15467	75,1	4,08
	Range	12681	433394	44,92	506,8	666285	582	32,8
	Min	2	7	0,39	3,5	37	18,5	0,76
	Max	12683	433401	45,31	510,3	666322	600,5	33,56

In addition to the analysis of the data according to the average impact (i.e., citations and views) per paper, this study sought to examine the average impact per country. The descriptive statistics in Table 3 portray similar patterns to those in Table 2, wherein Green OA yielded superior values to the other three types of OA in terms of the average number of papers, citations, and views per country. For instance, the average number of Green OA papers and citations per country was approximately 4690, 130245, and 181834, respectively; the closest category of Gold OA's corresponding values were 3575 papers, 49256 citations, and 84620 views per country. An examination of the performance of the OA models using the other impact metrics, namely the weighted and average scores of citations and views, reveals mixed results. The Green OA, however, performed poorer than Bronze OA, Gold OA, and Hybrid-Gold OA in terms of weighted citation and views impact, as well as the average number of citations and views per country. The median and range equally produced mixed results whereby no one model was superior to others. These mixed results are not unique to this study, as many studies have yielded different results in their analysis of the different types of OA. For example, Piwowar *et al*. (2018) found that Bronze OA publications were the most common in their study titled "The State of OA: A Large-scale Analysis of the Prevalence and Impact of OA articles" (Robinson-Garcia, Costas and van Leeuwen, 2019)witnessed disparities not only between countries but also between institutions within a country in terms of the number of OA publications per type of OA, with some institutions having more Gold OA publications than Green OA publications and Green OA publications enjoying higher traction within the majority of countries. In India (Nazim, 2021) found that Green OA publications' proportion of the total OA publications was 17.78%, followed by Gold OA (10.26%), Bronze OA (3.41%) and Hybrid OA (2.48%). On their part, Singh *et al.* (2020) observed that Gold OA was the most common throughout their study period (2014-2018), with about 10-12% of the articles being Gold OA and Green OA coming second with 6%, followed by Bronze OA (5%) and Hybrid OA (3%). These disparities can partly be associated with the usage of different sources of data such as Sci-Hub, Unpaywall, Scopus, and the Web of Science.

The second approach used to assess whether the type of OA matters in research impact was the correlation analysis of the number of papers, on the one hand, and the impact metrics, on the other hand. The Pearson correlation coefficients in Figure 3 show that there was a strong correlation between the number of citations and views in all models of OA, with the highest correlation coefficient being registered with views in the Green OA category ($r = 0.998$), followed by papers vs. citations in Gold OA ($r = 0.995$), and papers vs. views in Gold OA ($r = 0.994$). There were several instances where the correlations registered negative coefficients, implying inverse relationships between the number of papers and some impact indicators such as citations per paper, field-weighted citation impact, views per paper, and field-weighted views impact. Figure 3 further shows that the majority of the coefficients ranged between 0 and 0.5, implying weak to very weak relationships between the papers and impact indicators. A similar pattern was witnessed when we correlated the number of papers and impact indicators for all OA papers irrespective of the type of OA, whereby we obtained the following coefficients: The region's correlations were as follows: paper vs. citations ($r = 0.992$), papers vs FWCI ($r = -0.113$), papers vs. citations per paper ($r = -0.095$), papers vs. views ($r = 0.997$), papers vs. views per paper ($r = -0.122$) and papers vs. FWVI ($r = -0.143$). It is worth noting, however, that this relationship can be attributed to the normalised metrics used to proxy impact. The four metrics in terms of field-weighted citation impact, citations per paper, field-weighted views impact, and views per paper were normalised, while the number of papers with which they were correlated was not normalised. When benchmarking the coefficients obtained for each type of OA against those obtained for all OA papers, we noted that the correlation coefficients between papers and impact indicators in each OA model were higher than those obtained for all OA papers.

Bronze Open Access

	P	C	FWCI	C/p	V	V/p	FWVI
P	1,000						
C	0,975	1,000					
FWCI	0,059	0,096	1,000				
C/p	0,082	0,135	0,899	1,000			
V	0,996	0,990	0,076	0,105	1,000		
V/p	-0,018	0,024	0,659	0,676	0,006	1,000	
FWCVI	-0,042	0,000	0,744	0,679	-0,020	0,882	1,000

Gold Open Access

	P	C	FWCI	C/p	V	V/p	FWVI
P	1,000						
C	0,995	1,000					
FWCI	-0,055	-0,058	1,000				
C/p	-0,036	0,000	-0,180	1,000			
V	0,994	0,996	-0,051	-0,019	1,000		
V/p	-0,054	-0,048	0,021	0,230	-0,038	1,000	
FWVI	-0,078	-0,070	0,037	0,230	-0,059	0,983	1,000

Green Open Access

	P	C	FWCI	C/p	V	V/p	FWVI
P	1,000						
C	0,996	1,000					
FWCI	-0,102	-0,062	1,000				
C/p	-0,065	-0,023	0,964	1,000			
V	0,998	0,999	-0,063	-0,027	1,000		
V/p	-0,111	-0,080	0,827	0,827	-0,075	1,000	
FWVI	-0,130	-0,094	0,916	0,874	-0,090	0,960	1,000

Hybrid-Gold Open Access

	P	C	FWCI	C/p	V	V/p	FWVI
P	1,000						
C	0,961	1,000					
FWCI	-0,128	-0,042	1,000				
C/p	-0,130	-0,043	0,988	1,000			
V	0,965	0,999	-0,049	-0,052	1,000		
V/p	-0,133	-0,039	0,933	0,938	-0,038	1,000	
FWVI	-0,138	-0,036	0,964	0,950	-0,038	0,975	1,000

Figure 3: Correlation of scholarly outputs and impact of OA publications in sub-Saharan Africa by type of OA, 2012-2021

Key: P (papers); C (citations); FWCI (field-weighted citation impact); C/p (citations per paper); V (views); V/p (views per paper); FWVI (field-weighted views impact)

Table 4: Model summary for each type of OA

	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
Bronze	1.000[a]	.999	.999	81.439	.999	8238.773	6	42	<.001
Gold	.996[a]	.993	.991	836.870	.993	931.653	6	42	<.001
Green	.999[a]	.997	.997	706.409	.997	2576.934	6	42	<.001
Hybrid-Gold	.975[a]	.950	.943	450.861	.950	132.977	6	42	<.001

Key: [a] = Predictors: (Constant), Field-Weighted Views Impact, Number of Citations, Citations per paper, Views per paper, Field-Weighted Citation Impact, Views

Bronze Open Access

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	157.693	52.724		2.991	.005
Number of Citations	-.025	.001	-.585	-17.439	<.001
Field-Weighted Citation Impact	16.094	40.407	.005	.398	.692
Citations per paper	1.500	3.328	.005	.451	.654
Views	.057	.001	1.575	47.106	<.001
Views per paper	-9.238	4.068	-.023	-2.271	.028
Field-Weighted Views Impact	20.048	70.242	.003	.285	.777

Gold Open Access

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1787.051	725.039		2.465	.018
Number of Citations	.047	.012	.647	3.915	<.001
Field-Weighted Citation Impact	-.145	.532	-.004	-.272	.787
Citations per paper	-95.098	46.946	-.029	-2.026	.049
Views	.014	.007	.348	2.111	.041
Views per paper	52.399	61.421	.063	.853	.398
Field-Weighted Views Impact	-1464.009	1622.970	-.067	-.902	.372

Green Open Access

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	628.410	261.871		2.400	.021
Number of Citations	-.010	.007	-.252	-1.309	.197
Field-Weighted Citation Impact	931.338	586.455	.084	1.588	.120
Citations per paper	-54.591	35.162	-.061	-1.553	.128
Views	.034	.005	1.246	6.491	<.001
Views per paper	49.333	24.612	.083	2.004	.052
Field-Weighted Views Impact	-1638.588	649.040	-.145	-2.525	.015

Hybrid-Gold Open Access

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-25.910	100.526		-.258	.798
Number of Citations	-.036	.021	-1.309	-1.699	.097
Field-Weighted Citation Impact	46.492	66.441	.227	.700	.488
Citations per paper	2.095	5.392	.117	.389	.700
Views	.041	.014	2.273	2.947	.005
Views per paper	.511	2.797	.037	.183	.856
Field-Weighted Views Impact	-112.583	59.825	-.467	-1.882	.067

Figure 4: Regression coefficients per OA model

Finally, Table 4 shows the model summary for each type of OA and the regression coefficients of the independent variables, which are the different impact indicators of OA types in this study. Statistically, they are also known as the predictor variables, while papers, standing for the preferred mode of OA, were treated as the dependent variable. As shown in Table 3 and for the Bronze OA, three of the predictor variables were found to have a significant prediction, and they consist of the number of citations ($\beta = -.585$, $t = -17.439$, $p < 0.05$), views ($\beta = 1.575$, $t = 47.106$, $p < 0.05$) and views per paper ($\beta = -.023$, $t = -2.271$, $p < 0.05$). However, the field-weighted citation impact ($\beta = .005$, $t = .398$, $p < 0.05$), citation per paper ($\beta = .005$, $t = .451$, $p < 0.05$) and the field-weighted views impact ($\beta = .003$, $t = .285$, $p < 0.05$) did not significantly explain the publication patterns in Bronze OA. For the Gold OA, three predictor variables, namely the number of citations ($\beta = .647$, $t = 3.915$, $p < 0.05$), citation per paper ($\beta = -.029$, $t = -2.026$, $p < 0.05$) and views ($\beta = .348$, $t = 2.111$, $p < 0.05$) were found to have a significant account of the number of papers. However, other predictors such as the field-weighted citation impact, views per paper and field-weighted views impact did not have a significant influence on the papers in Gold OA. For the Green OA, two predictor variables, views ($\beta = 1.246$, $t = 6.491$, $p < 0.05$) and the field-weighted views impact ($\beta = -.145$, $t = -2.525$, $p < 0.05$) were found to have a significant influence on the papers in Green OA. This implies that other predictors such as the number of citations, field-weighted citation impact, citation per paper, and views per paper did not show any significant impact on the papers in Green OA. For the Hybrid-Gold OA, one predictor variable, views ($\beta = 2.273$, $t = 2.947$, $p < 0.05$) was found to have a significant impact. The other predictors, such as the number of citations, field-weighted citation impact, citation per paper, views per paper, and field-weighted views impact, did not significantly influence the papers in Hybrid-Gold OA. Importantly, views, as an independent variable, were found to be a single predictor of all the types of OA, including papers published in them. It is also important to note that the influence of views on papers published based on the type of OA was most noticeable and remarkable in Hybrid-Gold OA, followed by Bronze OA. From Table 3, an author is most likely to publish two papers or more in Hybrid-Gold because he/she is certain that the papers will be viewed at least once. In Gold OA, an author is most likely to publish almost two papers because he/she is certain that the papers will be viewed at least once. Also, in Green OA, an author is likely to publish one paper because he/she is certain it will be viewed at least once.

The Adjusted R-Square was used to determine which of the OA models performed best or was the fittest of all the models. Unlike the R-Square, this was preferred because of its power to penalise irrelevant variables. From Table 4, the Adjusted R-Square values for the Bronze, Gold, Green, and Hybrid-Gold OA were 99.8%, 98.2%, 99.4%, and 88.9%, respectively. These are the percentages of the predictors used in this study to explain the number of papers. From these percentages, the regression model of the Bronze OA performed best or was the best fit of all the models. The reason is that this model can help to explain or account for 99% of the papers published or to be published in Bronze OA given the number of citations, field-weighted citation impact, citation per paper, views, views per paper and field-weighted views impact as predictor variables. This was followed by the Green OA model with 99.4% prediction power and the Gold OA model with 98.2% prediction power. The last of the models was the Hybrid-Gold with 88.9% power of prediction.

Conclusion

In view of the findings in sub-Saharan Africa regarding OA publishing and its influence on research impact across various OA models, it becomes evident that the landscape is nuanced and complex. While Green OA and Gold OA exhibit favorable contributions to scholarly output and impact, the correlation analyses showcase intricate relationships. Notably, citations emerge as significant predictors for Bronze OA and Gold OA, albeit with inverse associations, signaling that higher publication numbers may not necessarily correlate with increased citations in these models within the region. Surprisingly, the views impact demonstrates a varying pattern, with Hybrid-Gold OA displaying the highest increase followed by Bronze OA and Green OA, highlighting an unexpected trend in the region's scholarly visibility. The performance of Bronze OA stands out as the most robust among the models studied, suggesting its potential significance in the context of sub-Saharan African research impact. These findings imply that while certain OA models display distinct advantages in terms of scholarly output and impact, their relationships with citation and views indicators exhibit complexities that merit further exploration. Such nuanced insights are pivotal for refining strategies, policies, and support mechanisms aimed at bolstering research visibility and impact within the unique ecosystem of Sub-Saharan Africa.

Recommendations

The findings of this study reveal that sub-Saharan African countries have continued to substantially contribute to the pool of OA scholarly output. However, there are some countries that have published less than 50% of their publications through any of the OA routes. Therefore, there is need to continue promoting OA publishing by Sub-Saharan African scholars especially in view of OA's being hailed as a development imperative for Africa (Adegbilero-Iwari, Adetoro and Salawu 2023). A sustained growth in the volume of research output on OA publishing channels is likely to increase their impact. In the context of this paper, the following interventions are likely to improve both the output and impact of OA publishing in Sub-Saharan Africa:

1. Although this research revealed that no specific type of current OA publishing generates better research impact than the other, scholars in the region may need to conduct more studies to develop OA publishing theories and models which may work best for sub-Sahara Africa.
2. Many researchers and scholars are still unaware of the potential of OA publishing on the impact of research. Universities and other research institutions can address this by strengthening the capacity of their staff and partners to take full advantage of the benefits of OA publishing while also a avoiding the pitfalls therein. Specialised digital literacy programmes which address OA competencies may be useful.
3. OA publishing relies heavily on technology. Many universities and research institutions in sub-Saharan Africa are deficient in these. Promoting sustainable OA publishing will require the institutions to develop and maintain essential digital infrastructure. These may include digital repositories, directories, journals and libraries.

4. Create and promote national, regional and global collaborations to share resources and knowledge about OA publishing. A Sub-Saharan OA regional network may also conduct advocacy campaigns resulting in facilitative policies and resources for OA publishing in the region. The policies may include acceptance, funding and assessment of scholarly OA publishing in the region.

5. Quality is one of the challenges hindering the impact of OA research. Sub-Saharan African institutions are encouraged to develop open access quality standards and enforcement mechanisms. These can benefit from the global best practices and case studies.

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Appendix A: Scholarly output and impact of OA publications by type of OA

Country	Type of OA	Number of Papers	Number of Citations	Field-Weighted Citation Impact	Citations per paper	Views	Views per paper	Field-Weighted Views Impact
Angola	Bronze	78	1020	1,28	13,1	2015	25,8	1,57
	Gold	408	4492	0,79	11	10979	26,9	1,16
	Green	548	14248	2,37	26	25874	47,2	2,7
	Hybrid	65	7589	13,28	116,8	12213	187,9	13,57
Benin	Bronze	344	3827	0,88	11,1	7653	22,2	0,99
	Gold	1760	22816	0,98	13	40767	23,2	1,11
	Green	2204	115617	4,26	52,5	171818	78	4,42
	Hybrid	330	66168	16,89	200,5	99644	302	17,99
Botswana	Bronze	439	6004	1,16	13,7	10056	22,9	1,04
	Gold	1581	20153	1,03	12,7	42276	26,7	1,27
	Green	2117	68637	2,69	32,4	117404	55,5	3,03
	Hybrid	280	17358	5,57	62	44926	160,5	9,9
Burkina Faso	Bronze	500	8950	1,17	17,9	14381	28,8	1,2
	Gold	2290	34027	0,97	14,9	52019	22,7	0,99
	Green	3021	57434	1,27	19	84524	28	1,2
	Hybrid	371	7638	1,63	20,6	11355	30,6	1,39
Burundi	Bronze	49	619	1,02	12,6	1519	31	1,1
	Gold	221	2786	0,95	12,6	5140	23,3	1,09
	Green	280	13803	4	49,3	21103	75,4	3,98
	Hybrid	45	9940	18,64	220,9	14772	328,3	18,3
Cameroon	Bronze	1084	16091	1,14	14,8	26433	24,4	1,16
	Gold	5115	68345	0,97	13,4	113173	22,1	1,02
	Green	6325	195840	2,4	31	287736	45,5	2,35
	Hybrid	601	84071	11,96	139,9	117181	195	11,52
Cape Verde	Bronze	35	371	0,82	10,6	864	24,7	1,17
	Gold	148	1506	0,77	10,2	4511	30,5	1,56
	Green	210	3672	1,82	17,5	10952	52,2	2,46
	Hybrid	24	1261	7,66	52,5	4690	195,4	9,13
CAR	Bronze	51	824	1,13	16,2	1659	32,5	1,81
	Gold	212	3611	0,99	17	4752	22,4	1,01
	Green	297	7527	1,45	25,3	10066	33,9	1,53
	Hybrid	21	976	2,25	46,5	1211	57,7	2,52
Chad	Bronze	45	381	0,65	8,5	765	17	0,82
	Gold	192	2428	0,97	12,6	4678	24,4	1,08
	Green	249	5116	1,63	20,5	10849	43,6	2,28
	Hybrid	44	1640	3,69	37,3	5222	118,7	7,11
Comoros	Bronze	12	64	0,44	5,3	332	27,7	0,85
	Gold	72	804	0,99	11,2	1294	18	0,84
	Green	91	1227	1,27	13,5	1857	20,4	0,92
	Hybrid	8	69	0,94	8,6	161	20,1	0,76
Congo	Bronze	373	11730	2,47	31,4	13376	35,9	1,6
	Gold	1547	25737	1,25	16,6	38234	24,7	1,15
	Green	2301	88615	3,01	38,5	122338	53,2	2,74
	Hybrid	300	34093	9,68	113,6	49655	165,5	9,53
Cote D'Ivoire	Bronze	411	5900	1,1	14,4	10313	25,1	1,22
	Gold	1549	21544	0,97	13,9	37191	24	1,09
	Green	2154	80869	3,08	37,5	116988	54,3	2,86
	Hybrid	294	31969	9,38	108,7	43052	146,4	8,23

Djibouti	Bronze	12	99	0,6	8,3	374	31,2	1,18
	Gold	75	910	1,3	12,1	1584	21,1	0,9
	Green	93	1434	1,34	15,4	2519	27,1	1,1
	Hybrid	4	44	0,53	11	100	25	0,97
DRC	Bronze	147	3059	2,72	20,8	4384	29,8	1,82
	Gold	885	8626	1	9,7	15932	18	1
	Green	1165	30615	2,48	26,3	45443	39	2,29
	Hybrid	144	15475	9,8	107,5	21008	145,9	9,43
Equatorial Guinea	Bronze	19	318	0,98	16,7	300	15,8	0,68
	Gold	87	1429	1,17	16,4	1731	19,9	0,91
	Green	106	5615	4,01	53	5572	52,6	2,8
	Hybrid	6	3062	45,31	510,3	3093	515,5	30,68
Eritrea	Bronze	28	361	0,98	12,9	540	19,3	0,91
	Gold	167	1732	0,89	10,4	2750	16,5	0,8
	Green	175	3111	1,28	17,8	4525	25,9	1,19
	Hybrid	15	756	1,54	50,4	699	46,6	1,62
Ethiopia	Bronze	1798	33591	1,4	18,7	45630	25,4	1,13
	Gold	17659	234192	1,03	13,3	332935	18,9	0,86
	Green	16982	391256	1,74	23	537686	31,7	1,58
	Hybrid	1584	106549	5,73	67,3	168324	106,3	5,97
Gabon	Bronze	192	5003	1,85	26,1	6259	32,6	1,62
	Gold	702	13921	1,22	19,8	16382	23,3	1,04
	Green	1083	32528	1,89	30	36889	34,1	1,54
	Hybrid	128	5130	2,58	40,1	6896	53,9	2,58
Gambia	Bronze	194	8770	2,5	46,2	7214	38	1,85
	Gold	922	21556	1,54	23,4	26816	29,1	1,33
	Green	1506	76796	3,32	51	78095	51,9	2,74
	Hybrid	282	25357	4,69	89,9	20341	72,1	4,19
Ghana	Bronze	1435	29804	1,59	20,8	43486	30,3	1,36
	Gold	9305	123266	1,01	13,2	214245	23	1,02
	Green	10548	320942	2,32	40,4	452776	42,9	2,07
	Hybrid	1412	100089	6,29	70,9	152512	108	6,08
Guinea-Bissau	Bronze	74	1845	2,09	24,9	1648	22,3	1,21
	Gold	214	3557	1,25	16,6	4989	23,3	1,12
	Green	341	6735	1,48	19,8	8835	25,9	1,24
	Hybrid	41	883	1,45	21,5	895	21,8	1,02
Guinea	Bronze	105	5040	4,97	48	4621	44	2,67
	Gold	441	7212	1,26	16,4	9612	21,8	1,03
	Green	591	17124	2,41	29	18317	31	1,53
	Hybrid	65	2491	3,14	38,3	2266	34,9	1,56
Kenya	Bronze	2386	59486	1,71	24,9	73772	30,9	1,4
	Gold	11179	188656	1,2	16,9	281444	25,2	1,12
	Green	16325	521631	2,24	32	667403	40,9	1,89
	Hybrid	2889	151697	4,18	52,5	221741	76,8	3,81
Lesotho	Bronze	63	760	1,05	12,1	1617	25,7	1,43
	Gold	210	2356	0,92	11,2	3793	18,1	0,83
	Green	231	4869	1,71	21,1	5380	23,3	1,07
	Hybrid	26	1887	6,86	72,6	909	35	2,01
Liberia	Bronze	99	2704	2,62	27,3	4269	43,1	2,5
	Gold	311	4437	1,3	14,3	8067	25,9	1,4
	Green	471	33516	6,36	71,2	44163	93,8	5,6
	Hybrid	53	20996	34,96	396,2	28889	545,1	33,56

Madagascar	Bronze	299	5698	1,22	19,1	8755	29,3	1,2
	Gold	1082	15218	0,97	14,1	23716	21,9	0,99
	Green	1684	33638	1,39	20	53561	31,8	1,45
	Hybrid	220	4999	1,95	22,7	8211	37,3	1,73
Malawi	Bronze	590	16250	1,97	27,5	15310	25,9	1,23
	Gold	2918	44484	1,15	15,2	68048	23,3	1,11
	Green	4755	121767	1,82	25,6	145682	30,6	1,46
	Hybrid	720	31839	3,62	44,2	38716	53,8	2,72
Mali	Bronze	251	6501	1,82	25,9	6996	27,9	1,46
	Gold	1059	17369	1,08	16,4	25525	24,1	1,08
	Green	1751	45204	1,7	25,8	54616	31,2	1,34
	Hybrid	260	10182	3,08	39,2	10401	40	1,71
Mauritania	Bronze	39	495	0,89	12,7	825	21,2	0,88
	Gold	197	1805	0,77	9,2	3502	17,8	0,84
	Green	249	3260	1,08	13,1	7895	31,7	1,64
	Hybrid	22	950	4,15	43,2	3232	146,9	8,6
Mauritius	Bronze	221	2692	1,26	12,2	7609	34,4	1,71
	Gold	521	9055	1,48	17,4	19095	36,7	1,63
	Green	749	26411	2,79	35,3	48701	65	2,77
	Hybrid	122	9083	6,73	74,5	14510	118,9	5,95
Mozambique	Bronze	388	10414	1,76	26,8	13155	33,9	1,67
	Gold	1832	27767	1,26	15,2	49228	26,9	1,28
	Green	2593	130557	4,02	50,3	168360	64,9	3,5
	Hybrid	372	63658	15,21	171,1	86540	232,6	13,95
Namibia	Bronze	363	7440	1,38	20,5	10244	28,2	1,54
	Gold	888	12963	1,09	14,6	23682	26,7	1,12
	Green	1402	51758	2,75	36,9	83755	59,7	3,08
	Hybrid	223	23940	9,06	107,4	39812	178,5	10,39
Niger	Bronze	153	2247	1,11	14,7	3348	21,9	1,01
	Gold	583	7674	0,99	13,2	14847	25,5	1,23
	Green	903	20030	1,55	22,2	28590	31,7	1,39
	Hybrid	137	6221	1,92	45,4	5320	38,8	1,48
Nigeria	Bronze	7207	77808	1,08	10,8	159282	22,1	1,01
	Gold	23684	253346	0,92	10,7	490777	20,7	0,91
	Green	23248	502384	1,68	21,6	807434	34,7	1,61
	Hybrid	3479	139578	3,19	40,1	216353	62,2	3,31
Rwanda	Bronze	353	6364	1,48	18	8392	23,8	1,22
	Gold	1674	21207	1,14	12,7	38514	23	1,15
	Green	2132	101547	4,24	47,6	152255	71,4	4,19
	Hybrid	350	53581	14,15	153,1	83950	239,9	14,82
Sao Tome and Principe	Bronze	4	19	0,43	4,8	65	16,3	1,24
	Gold	22	334	1,23	15,2	2078	94,5	3,67
	Green	32	529	1,17	16,5	2386	74,6	2,91
	Hybrid	2	7	0,39	3,5	37	18,5	1
Senegal	Bronze	637	12763	1,68	20	17152	26,9	1,33
	Gold	2407	36156	1,05	15	52551	21,8	0,97
	Green	3516	71270	1,43	20,3	101630	28,9	1,27
	Hybrid	394	8745	1,79	22,2	15467	39,3	1,62
Seychelles	Bronze	73	1612	1,33	22,1	3179	43,5	2,29
	Gold	141	2543	1,26	18	5084	36,1	1,75
	Green	333	24949	5,18	74,9	45824	137,6	5,8
	Hybrid	52	16953	23,67	326	31224	600,5	23,7

Sierra Leone	Bronze	140	3698	2,5	26,4	4576	32,7	1,87
	Gold	654	10636	1,47	16,3	15502	23,7	1,21
	Green	871	32385	2,45	37,2	30295	34,8	1,71
	Hybrid	126	11280	2,35	89,5	5512	43,8	1,5
Somalia	Bronze	31	320	1,06	10,3	682	22	0,93
	Gold	154	0,91	1629	10,6	4118	26,7	1,26
	Green	169	2294	1,27	13,6	5025	29,7	1,45
	Hybrid	16	157	1,03	9,8	512	32	1,49
South Africa	Bronze	17141	425379	1,85	24,8	487509	28,4	1,4
	Gold	57444	801882	1,11	14	1510842	26,3	1,19
	Green	85149	2225847	1,84	26,1	3097278	36,4	1,64
	Hybrid	12683	433401	2,64	34,2	666322	52,5	2,45
South Sudan	Bronze	17	101	0,44	5,9	319	18,8	1,01
	Gold	111	1189	1,1	10,7	1981	17,8	0,97
	Green	111	1403	1,16	12,6	2238	20,2	1,04
	Hybrid	15	128	0,88	8,5	289	19,3	0,9
Sudan	Bronze	675	8280	0,95	12,3	14853	22	1,09
	Gold	2802	36452	1,03	13	68756	24,5	1,17
	Green	2897	84793	2,12	28,4	114436	38,3	1,96
	Hybrid	345	8626	2,2	25	16075	46,6	2,58
Swaziland	Bronze	108	2152	1,52	19,9	3083	28,5	1,66
	Gold	352	5360	1,07	15,2	10050	28,6	1,18
	Green	510	10130	1,45	19,9	16396	32,1	1,46
	Hybrid	79	1443	1,52	18,3	2401	30,4	1,42
Tanzania	Bronze	1333	26831	1,49	20,1	32966	24,7	1,15
	Gold	6522	105509	1,14	16,2	150128	23	1,04
	Green	8888	251948	2,09	28,3	338874	38,1	1,88
	Hybrid	1292	80111	5,19	62	118238	91,5	5
Togo	Bronze	121	1336	0,81	11	2476	20,5	0,89
	Gold	576	5878	0,81	10,2	10939	19	0,85
	Green	704	31689	3,81	45	40987	58,2	3,29
	Hybrid	69	23098	29,33	334,8	25174	364,8	22,89
Uganda	Bronze	1410	35913	1,98	25,5	37000	26,2	1,26
	Gold	7338	106425	1,09	14,5	164710	22,4	1,03
	Green	10614	293408	2,11	27,6	377040	35,5	1,76
	Hybrid	1376	65554	4,13	47,6	103325	75,1	4,08
Zambia	Bronze	533	9727	1,47	18,2	11676	21,9	1,05
	Gold	2336	35435	1,2	15,2	56013	24	1,15
	Green	3535	128221	2,93	36,3	177215	50,1	2,71
	Hybrid	503	51800	8,76	103	77342	153,8	9,08
Zimbabwe	Bronze	536	13434	2,1	25,1	17092	31,9	1,5
	Gold	2608	34733	1,11	13,3	61420	23,6	1,02
	Green	3584	87804	1,82	24,5	120304	33,6	1,53
	Hybrid	643	19219	2,42	29,9	32026	49,8	2,43

Appendix B: Scholarly output and impact of OA and NOA publications

	Non Open Access Publications						Open Access Publications						TOTAL
	Papers		Citations		Views		Papers		Citations		Views		
Country	n	%	n	FWCI	n	FWVI	n	%	n	FWCI	n	FWVI	
Angola	564	45,45	4352	0,79	12364	0,92	677	54,55	15354	2,11	28799	2,42	1241
Benin	2455	45,66	22328	0,66	56220	0,87	2922	54,34	120492	3,39	184131	3,52	5377
Botswana	3733	55,96	32213	0,75	79687	0,98	2938	44,04	75847	2,19	134170	2,44	6671
Burkina Faso	2273	38,22	24295	0,68	55795	0,9	3674	61,78	62858	1,17	95835	1,12	5947
Burundi	354	48,90	4615	0,92	9790	1,05	370	51,10	14666	3,27	23230	3,28	724
Cameroon	7953	49,26	83784	0,82	173763	0,87	8192	50,74	210964	2,03	319821	1,99	16145
Cape Verde	178	40,64	2040	0,78	5143	1,12	260	59,36	4049	1,58	12141	2,2	438
CAR	237	40,31	2232	0,85	4445	0,83	351	59,69	8025	1,33	10993	1,44	588
Chad	205	38,61	1277	0,64	3361	0,74	326	61,39	5574	1,38	11982	1,91	531
Comoros	55	34,59	539	0,64	1217	0,86	104	65,41	1307	1,18	2152	0,91	159
Congo	1707	38,89	17935	0,69	36986	0,85	2682	61,11	95108	2,84	129906	2,49	4389
Cote D'Ivoire	2413	46,66	18368	0,58	50351	0,8	2758	53,34	85581	2,55	126980	2,4	5171
Djibouti	152	56,51	1378	0,69	3655	0,99	117	43,49	1648	1,31	2965	1,05	269
DRC	712	33,38	5998	0,67	14761	0,88	1421	66,62	32215	2,21	49646	2,05	2133
Equatorial Guinea	56	30,77	446	0,56	1082	0,8	126	69,23	5893	3,55	5872	2,47	182
Eritrea	224	49,02	1877	0,71	5979	1,12	233	50,98	3553	1,13	5338	1,06	457
Ethiopia	13374	36,90	141854	0,83	324983	0,96	22874	63,10	444861	1,53	642503	1,37	36248
Gabon	737	36,59	7128	0,64	14649	0,77	1277	63,41	34956	1,73	40010	1,41	2014
Gambia	306	15,67	6669	1,32	7568	0,99	1647	84,33	78901	3,13	81399	2,61	1953
Ghana	13237	48,34	135572	0,88	355012	1	14147	51,66	354044	1,96	526284	1,77	27384
Guinea	378	34,49	4781	1,07	7382	0,88	718	65,51	19623	2,4	20832	1,47	1096
Guinea-Bissau	151	27,55	2455	0,99	3404	0,94	397	72,45	7830	1,44	9771	1,2	548
Kenya	13031	39,29	153417	0,92	324295	1,05	20131	60,71	568935	2,02	757862	1,72	33162
Lesotho	354	50,57	1784	0,48	6232	0,77	346	49,43	5850	1,43	7666	1,08	700
Liberia	237	29,92	3212	1,34	5503	1,05	555	70,08	34290	5,63	45973	4,92	792
Madagascar	1514	42,71	15538	0,8	34419	0,88	2031	57,29	37491	1,32	60471	1,35	3545
Malawi	2132	28,45	28435	0,86	52408	1,03	5363	71,55	128502	1,74	157931	1,4	7495
Mali	935	31,91	12667	1,04	22377	0,94	1995	68,09	48676	1,63	60505	1,31	2930
Mauritania	326	51,18	2523	0,56	6069	0,85	311	48,82	3852	1,03	8932	1,46	637
Mauritius	2482	68,89	27239	0,92	89049	1,48	1121	31,11	30739	2,26	58708	2,3	3603
Mozambique	1418	31,36	17979	0,97	36686	1,16	3103	68,64	135781	3,52	179230	3,09	4521
Namibia	2187	53,77	16348	0,82	50049	1,11	1880	46,23	58054	2,36	94798	2,56	4067
Niger	690	38,50	8156	0,92	15300	0,91	1102	61,50	24494	1,45	32784	1,3	1792
Nigeria	54882	58,16	414596	0,67	1114935	0,84	39484	41,84	618169	1,31	1094044	1,27	94366
Rwanda	1938	41,09	19989	0,93	44061	1,02	2779	58,91	107327	3,5	165260	3,45	4717
Sao Tome and Principe	25	37,88	188	0,68	613	0,98	41	62,12	554	0,98	2528	2,51	66
Senegal	4061	48,51	32305	0,65	74357	0,79	4311	51,49	81206	1,4	115541	1,19	8372
Seychelles	243	39,07	3180	0,98	7359	1,16	379	60,93	25524	4,64	46706	5,18	622
Sierra Leone	451	29,95	8045	1,47	12053	1,28	1055	70,05	34234	2,24	33794	1,59	1506
Somalia	224	49,12	3471	1,14	5783	1,24	232	50,88	2742	1,14	6625	1,37	456
South Africa	132280	53,46	1438942	0,97	3210470	1,04	115155	46,54	2517411	1,62	3716032	1,46	247435
South Sudan	73	32,30	365	0,48	1533	0,84	153	67,70	1567	0,99	2847	0,98	226
Sudan	5260	54,52	48700	0,76	124639	1,02	4388	45,48	95856	1,7	142365	1,63	9648
Swaziland	648	48,91	5179	0,72	12951	0,84	677	51,09	11876	1,32	19445	1,3	1325
Tanzania	6235	36,72	72421	0,91	160426	1,04	10745	63,28	271872	1,9	377902	1,71	16980
Togo	953	50,83	5623	0,43	18071	0,73	922	49,17	32977	3,06	103325	4,08	1875
Uganda	5842	50,00	62810	0,87	143268	1,02	5842	50,00	62810	0,87	143268	1,02	11684
Zambia	2005	32,10	21341	0,86	44261	0,99	4242	67,90	135781	2,62	191350	2,42	6247
Zimbabwe	4562	49,72	38340	0,77	98971	0,91	4613	50,28	97080	1,65	143237	1,4	9175

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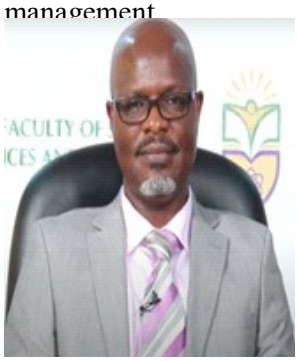

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Use of Artificial Intelligence Technologies in Rendering Library Services: An Empirical Evidence from University Libraries in Africa

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Abstract

The main purpose of this paper is to investigate the level of adoption of artificial intelligence(AI) to support library services delivery in university libraries in Africa. Qualitative research method was adopted to collect data. A preliminary survey of 102 university libraries in English speaking countries in Africa was conducted to identify the university libraries that have adopted AI in their libraries. Content analysis was used to analyse the responses. The study found that the only few university libraries in Africa have adopted AI technologies such as Chatbot, ChatGPT, LibKey from ThirdIron, robots, RFID technology and Grammarly. These AI technologies are used to render different library services like answering of directional and ready reference questions posed by library users, serving as a knowledge base for cataloguing information of library materials, self-check-out machine for books, used as a marketing tool for the library, tool for statistics evaluation and recommendations, assisting in the charging and discharging of library materials, etc. Lack of funds to acquire the AI tools, training of librarians, and lack of full knowledge of AI were the most mentioned challenges associated with adoption of AI in the libraries. The study recommended a formulation of policy to guide the adoption of new technologies such as AI, and training and re-training of librarians through workshops equip librarians with skills needed to effectively use the AI technologies.

Keywords: Artificial Intelligence, Robotics, Chatbots, RFID, Librarians, Nigeria, South Africa.

Introduction

Artificial intelligence (AI) technologies have strongly influenced the world of work in the 21st Century. Nwakunor (2021) defined artificial intelligence as computer controlled robots that think intelligently like human beings. These robots are controlled electronically with the aid of the computer by mimicking the competences of the human mind. Artificial Intelligence keeps records and analyses every action being made by the user (Nwakunor, 2021). The origin of AI can be traced to John McCarthy's research in 1955, with the assumption that every aspect of learning and other forms of intelligence can be stimulated through the use of a machine (Wang, 2018). Merriam-Webster English Dictionary (2018) stated that artificial intelligence is "a part of computer science that deals with giving ability to the machines to look as if they have natural human intelligence." These human capabilities of AI are improved through learning from experience and adaption over time. As an aspect of computer science, AI comprises an expert system, fuzzy logic, artificial neural network, evolutionary algorithms, case-based reasoning, image processing, natural language

processing, speech recognition, and robotics (Kusumanchi, 2019).

In the library setting, AI technologies are now being used in libraries to support and render library services. The adoption of AI can improve library services and provide access to accurate information that can drive growth and development in this information age. In the library, AI can be used to develop programmes for effective reference services, scanning of textbooks, and the identification of appropriate subject categories (Tella, 2020). Furthermore, AI technologies can assist library users on how they can locate library materials through intelligent tutoring system and automated library services (Tella, 2020). Therefore, AI adoption and use in libraries will allow better information processing, and at the same time, better information search that will excite both library personnel and users giving easier and faster access to information. AI technologies are being adopted in libraries throughout the world for a wide array of purposes such as everyday service delivery (IFLA-FAIFE, 2020).

Artificial intelligence has made it possible to provide solutions to pressing challenges facing libraries, such as shelving of books and other library materials, cataloguing and acquisition of library materials, among others (Ajakaye, 2022). Consequently, library services can be done in more effective and efficient ways for improved user satisfaction. Therefore, library users can access timely and accurate information quickly and promptly. Fernandez (2016) noted that using AI in academic libraries will help to analyse big data, create metadata, and improve search translation. This means that using AI in academic libraries will make library materials more accessible and available, and allow the staff to answer users' queries on AI use. Tella (2020) stressed the need for academic libraries to re-position themselves to take relative advantage of artificial intelligence potentials by refining the quality of library services in this era of the information age. According to Ajakaye, (2022; p.1) "Librarians need to be innovative in their thinking to stay relevant in their jobs because AI has found numerous applications in libraries ranging from book filing to book delivery."

The IFLA Statement has outlined the key roles libraries can take on in a society that employs AI; and reported that throughout the world, some libraries and library organisations are already engaged in raising awareness and AI literacy, developing and working with AI, and taking part in debates around its impact on the library sector and beyond (IFLA-FAIFE, 2020). Artificial intelligence in library service delivery has aided in the improvement of many librarians' job responsibilities, including cataloguing, indexing, information retrieval, reference services, and other tasks. It can be used in a variety of applications, including speech recognition, machine translation, and library robots (Tella 2020). Kusumanchi (2019) noted that AI is transforming day by day with different features such as quantum computing, artificial neural networks, facial recognition, deep learning and chatbots.

Libraries, particularly those in universities in developing countries, have had difficulty adopting digital technology, and they also show resistance to change when using new technologies for a variety of library functions in developing nations like Nigeria (Wheatley and Hervieux, 2019). Tella (2020) stressed that libraries in the developed countries have accepted and used AI technologies virtually in all spheres of life whereas those in developing countries are still struggling to find their feet. Librarians mostly in Africa have begun to incorporate artificial technologies in the library system so as to meet up with the current trends in the worldwide. Despite efforts to meet with the current trends, no documentation on the incorporation of Artificial intelligence in academic libraries in African educational institutions is seen. Evidently, the available literature on artificial intelligence in libraries were mostly carried out in institutions in the developed countries. Little or no documents were found on the application of artificial intelligence in libraries in developing countries mostly in Africa. Therefore, the present study aims to fill the gap by investigating the extent university libraries in Africa have adopted artificial intelligence in rendering library services. To achieve this, three research questions were raised to guide the study.

Research Questions

1. What type of AI is being adopted for use in the university libraries in Africa?

2. What library services are the AI deployed to render?
3. What are the challenges encountered in adopting AI in university libraries in Africa?

Literature Review

The Use of AI in University Libraries

Artificial intelligence is the programming and development of computers to perform human required-intelligence task, such as speech recognition, decision-making, visual perception, language translation, talking and emotional feelings (Irizarry-Nones, Palepu and Wallace, 2017). Oracle (2022) defined Artificial intelligence as software or hardware that can carry out tasks by simulating human intellect and then interactively improves itself using the data it gathers. AI encompasses a wide range of fields which is not limited to computer science alone, but also philosophy, linguistics, psychology as well as other fields of life (Deloitte, 2018). Several libraries have recently found compelling use of AI, such as to support library systems for the benefit of library patrons and employees in Iran (Asemi and Asemi, 2018), as well as the use of AI in assisted information literacy instruction (Talley, 2016).

The AI revolution in libraries is projected to have a significant impact on a number of areas, including data processing, literacy, and online and virtual services (Winkler and Kiszl, 2021). Omame and Alex-Nmecha (2020) posited that AI has the potential to revolutionise the way libraries are managed, from the way library materials are catalogued and organised to the way librarians and patrons interact. Scholars have argued that AI can be used in the area of library security, as university libraries are now deploying AI-based facial recognition technology to track and monitor users, particularly service areas (American Library Association, 2022; Datagen, 2022). With AI, tasks such as the answering of directional questions, giving library tours, welcoming library users and locating an information source in the library can be done automatically (Karsten and West, 2015)

Artificial intelligence can be divided into three types: symbolism, connectionism, and behaviorism (Adejo and Misau, 2021). Symbolism is an intelligent simulation method based on logical reasoning to simulate human intelligent behavior. The main principle of connectionism is the connection mechanism and learning algorithm between neural network and neurons network. The theory of behaviorism is cybernetic and perceptual-action control system (Adejo and Misau, 2021). Presently, the popular technical fields involved in artificial intelligence research are: problem solving, natural language processing, artificial neural networks, genetic algorithms, expert systems, knowledge engineering, artificial life, deep learning, intelligent control etch (Liu, 2016). Natural Language Processing is another area where artificial intelligence technology could help the academic library gain traction. This technique allows a computer to understand the main linguistic concepts within a query or solution, with the goal of designing and building computers that can analyse, understand, and generate language in the way that humans do (Kumar, 2004). Natural Language Processing (NLP), according to Zulaikha (2020), is the study of extracting information from natural human language in order to communicate with robots and grow enterprises. When applied to academic libraries, some of the methods employed in natural language processing that boost artificial intelligence include: voice text messaging, spell checker, autocomplete, spam filters. Omame and Alex-Nmecha (2020) reported that NLP may be utilised in libraries to create intelligent expert information retrieval systems that users can engage with directly using natural language. The computer receives natural language as input, analyses and processes it, and then responds with the information required.

Given the wide range of services provided by academic libraries around the world, the incorporation of robotic services into the circulation unit of an academic library has become essential. Robotics is defined as a mechanical device that uses artificial intelligence techniques to perform automation tasks under direct human supervision, a pre-defined program, or a set of general guidelines (Vysakh and Rajendra 2020). Robots are multi-purpose manipulators that are automatically controlled, reprogrammable, and programmable in three or more axes. They can be fixed in place or transportable for use in automation applications. Vysakh and Rajendra (2020) reported that library such as Temasek

Polytechnic Library, University of Chicago Library, Shanghai Library have begun to use robots instead of humans in a variety of procedures, particularly those that are hazardous and time-consuming. For instance, a robot at the PESIST Central Library assists in filing, classifying, and replacing volumes on the shelf, and libraries with large collections are now adopting robots for inventory purposes (Vysakh and Rajendra, 2020). The use of robots to perform this duty improves the efficiency of the library's operations.

The use of AI in library services in the African continent is very much in its infancy (Hervieux and Wheatley, 2021). Yusuf et al. (2022) assessed the application of artificial intelligence for efficacy in library service delivery in university libraries in Nigeria. The study revealed that the adoption of artificial intelligence by librarians in university libraries in Nigeria is relatively low as a result of a wide variety of challenges specific to developing nations. A recent study by Emiri, (2023) investigated how librarians working in the various university libraries in Southern Nigeria adopted and use artificial intelligence and found that AI technologies have not been truly adopted in university libraries in Southern Nigeria. The AI technologies like robots, chatbots, face recognition, touch recognition, RFID technologies, humanoids, AI classification tools, machine-readable catalogue, and AI smart features are still lacking in Southern Nigeria's university libraries. Yakubu, Yagana, and Umar (2023) investigated librarians' intention to use artificial intelligence for effective library service delivery in university libraries in Nigeria and found that the librarians under study have shown great intention to use artificial intelligence (AI) in their libraries. In Nigeria, Yusuf, et al. (2022), reported that only University of Lagos has adopted the use of artificial intelligence in some library services and operations, and also added that library professionals' awareness of the use of artificial intelligence in library services and operations is still low. Adejo and Misau (2021) studied how the application of artificial intelligence could be used in Nigerian academic libraries. The study showed that AI could be applied in academic library services in Nigeria like Expert Systems in Reference Services, Technical, Indexing, Acquisition and its application in Natural Language Processing, Pattern Recognition and Robotics in library activities. Therefore, the study recommended that academic libraries in Nigeria should embrace the use of artificial intelligence in the library operations, library staff be trained on its use in the library service delivery in addition to its institution in all library units.

The study by Grant and Camp (2018) reported that many academic libraries, mostly in wealthier nations, have adopted AI to meet the many service demands of their customers, including reference and circulation services. Some AI use cases as reported in IFLA-FAIFE, (2020) includes: The National Library of Norway, for example, has experimented with applying Machine Learning to automate Dewey Decimal classification. Also, The Stanford University Library AI studio is developing projects exploring AI application in libraries for internal information processing and library collection discovery and analysis, the Helsinki Central Library Oodi has introduced an AI-powered mobile application for library users, designed to make reading suggestions and assist with library collection discovery. Manjunatha and Patil (2020) looked at the use of smart technology in engineering college libraries in Karnataka. The data suggests that most engineering university libraries are already familiar with smart technologies and have adopted blockchain, augmented reality, artificial intelligence, and other cutting-edge systems. Yu, et al (2019) investigated the application of artificial intelligence in a smart library. The study cites a few artificial intelligence applications that can be employed in smart libraries, including face recognition, chatbots, and self-service AIs.

Nawaz, Gomes, and Saldeen (2020) studied artificial intelligence methods for library resources and services during the COVID-19 epidemic. The study demonstrates that a number of library services such as user identification in speech recognition or typing, monitoring of users as they use library resources and services, chatbots for reference services, robot assistants, drone surveillance for library security, AI alarms for reminding users when it's time for their scheduled appointment with a librarian, and AI-based tutorials for keeping users up to date with the most recent findings and discoveries in their field can benefit from the use of AI. Asefeh and Asemi (2018) list various ways in which AI technologies can be used to improve library services to include the followings: circulation services,

shelving of books, cataloguing of library materials, among others. Mogali (2019) conducted a study on how artificial intelligence is used in libraries and found that expert systems in libraries, such as research pointers, online reference help, Amswerman, and Plexus can assist in rendering library services. Expert systems have also proven beneficial for carrying out tasks related to acquisition, cataloguing, classification, indexing, and other library procedures.

Lund et al (2020) studied the perceptions toward artificial intelligence among academic library employees and asked the role within libraries that librarians indicate they would most likely to see AI introduced. The study found that support/ improvement of the library discovery search is the overwhelmingly favourite selection, followed by reference services and cataloguing assistance. Studies have shown that AI such as humanoid robots can be used in libraries for a variety of tasks, including instruction, community building, chat services for online messaging, automation of library procedures, and improving the effectiveness of service delivery (Nguyen, 2020; Nawaz and Saldeen, 2020; Igbinovia and Okuonghae, 2021).

Yao et al. (2015) conducted a research on intelligent talking robots to improve library services and found that the Xiaotu robot, which can interact with users and provide assistance, is effective in enhancing library reference services. Similarly, the study by Corrado (2021) pointed out that AI can be applied in several technical service areas, such as assigning and creating subject headings, classification, and metadata description.

Challenges Associated with the Deployment of AI in Academic Libraries

Regarding the challenges of AI adoption in academic libraries, the study by Yusuf et al. (2022) primarily focused on librarians' low awareness of how to use AI to meet their service needs and the high disruption that AI has caused to traditional library services, which continues to shock most library professionals. According to Tait and Pierson (2022), the adoption of AI and robots in libraries may be hampered by a lack of skills and the need for training before implementation. In line with the above viewpoint, Hervieux and Wheatley (2021) in their study argued that the low adoption rate of AI and Robots in libraries is due to a lack of knowledge of these technologies. The study by Emiri, (2023) reported that adoption of AI challenges include considerable disruption brought by AI to conventional library services, a lack of skills and the need for training prior to adoption, erratic power supply, and a lack of suitable infrastructure for adoption.

The use of AI in libraries poses a number of ethical issues also (Cox, 2022) and there is a recurrent fear that AI may in some way replace human librarians' work. For example, the study by Korinek and Stiglitz (2017) reported that the use of AI poses a threat to librarians' work and that caution should be exercised before widespread implementation in libraries. Similarly, World Bank (2016) maintained that developing countries may be more affected by the adoption of AI because it will lead to a high job loss rate. The report further states that 69% of job loss will be experienced in India through AI adoption; 72% in Thailand; 77% in China and 85% in Ethiopia. All these studies indicate that AI can lead to job losses and the potential for gross job destruction.

Liau (2019) conducted research on the benefits of robots for library operations. The researcher highlighted a few obstacles that might prevent libraries from adopting robots. These include the high skill requirements to work with robots, the need to redesign workflow, the fact that robots are only designed to perform one or two tasks and cannot be used for all library activities, also robots occasionally have temper tantrums that could disrupt library services, and others. Oghenetega, Umeji, and Obue (2014) identified a number of factors that work against the adoption of AI in library operations especially in developing countries. They are: poor maintenance ethics, inadequately trained staff, high costs, networking issues, a lack of adequate facilities, an epileptic power supply, and technological issues. Yusuf, et al (2022) reported that the adoption of AI in academic libraries is setting a new level of efficient and effective library service delivery but the adoption in developing countries such as Nigeria is low due to some of the identified challenges which includes financial uncertainty, job loss, technological disadvantages among others. Echedom and Okuonghae (2021) reported that technologies like the AI expert system always require large amounts of data in order to function effectively. This becomes a major limitation where there is insufficient data or low data volumes.

While the enormous amount of data generated every day would require a long time to be processed, AI technologies that use machine learning can swiftly transform that data into useful knowledge (Ajani et al., 2022). The cost of processing the enormous amounts of data that AI programming demands is now the main drawback of employing AI. Nevertheless, researchers testified that the benefits of AI to its users significantly outweigh its cost (Ali et al., 2020). For instance, Hayani et al. (2021) acknowledged that when properly utilised, AI can enhance its users' productivity, economy, and decision-making process, as well as solving complex problems and manage repetitive task accurately than ever before. Emezaiwakpor, Idiodi and Urhiewhu (2023) reported that in planning to deploy artificial intelligence in Nigerian academic libraries, technical issues will be the major impediments that Nigerian academic libraries will be confronted in their ability to construct smart systems. The library must have up-to-date technology, such as computers and other devices. The study also reported the shortage of librarians who have been trained in artificial intelligence technologies (Emezaiwakpor, Idiodi, and Urhiewhu, 2023).

Methodology

Qualitative research method was adopted to collect data from librarians in-charge of the artificial intelligence unit. Qualitative method is when a researcher collects data from interview or open ended question that gives respondents time to mention responses. A preliminary study was carried out by sending e-mails to librarians working in university libraries in English speaking countries in Africa. The aim was to identify university libraries that have actually deployed AI to render library services in Africa. The e-mail addresses of the respondents were collected from the various university library websites in Africa. The question asked was "whether that particular university library had adopted AI technologies" sent as e-mail message to librarians working in university libraries in English speaking countries. In total, 389 e-mail messages were sent to librarians in 102 university libraries in Africa. At the end of that preliminary survey, eight university libraries were identified to have adopted AI in rendering library services. Among the number, one in Nigeria, and seven in South Africa.

The second phase was to send message containing the three open-ended questions through e-mail to the identified eight university libraries. Data collection started in March 2023 and ended in May 30, 2023. The three open-ended questions sent through e-mail to the librarians in-charge of AI in the eight university libraries in Africa are:

1. What type of artificial intelligence technologies are being used in your library?
2. What library services are the artificial intelligence technologies deployed to render in your library?
3. What are the challenges encountered in adopting artificial intelligence technologies in your library?

Thematic content analysis technique was used to analyse the qualitative data. Berg (2007) suggests one way of handling information analysis is by content analysis or qualitative analysis. Berg further stressed that content should be coded under certain themes or questions being asked. In this study, content analysis was used to categorise information obtained from the e-mail responses according to the questions and presented in table and chart. Responses from the respondents were also incorporated in the discussion section.

Results

Out of the 102 university libraries contacted in English Speaking countries in Africa, only eight university libraries were identified to have adopted artificial intelligence in rendering library services. The universities are: University of Lagos, Nigeria, University of Pretoria, South Africa, North West University, South Africa, University of Johannesburg, South Africa, University of the Free State, South Africa, University of the Witwatersrand, South Africa, Vaal University of Technology, South Africa, and Rhodes University, South Africa.

Table 1: Type of Artificial intelligence adopted in the responding university libraries.

	Name of university	Country	Type of AI adopted
1	University of Lagos	Nigeria	Robot
2	University of Johannesburg	South Africa	Chatbot, ChatGPT, Online plagiarism game.
3	Vaal University of Technology	South Africa	RFID
4	Rhodes University	South Africa	Chatbot, LibKey from ThirdIron
5	North West University	South Africa	Robot and Chatbot
6	University of the Free State	South Africa	RFID technology and Grammarly
7	University of Witwatersrand	South Africa	Chatbot and RFID
8	University of Pretoria	South Africa	Robot

In Table 1, results revealed that the few university libraries in Africa have adopted different AI technologies such as Chatbot, ChatGPT, LibKey from ThirdIron, robots, RFID (Radio Frequency Identification Technology) and Grammarly. In addition, one librarian wrote:

> We are now busy investigating other AI tools such as ChatGPT. This we are doing in collaboration with various other divisions at the university, and there is a task group assigned to look at the bigger impact.

According to Tella (2020), academic libraries must reposition themselves to make use of the potentials of artificial intelligence to improve the quality of library services in this information age. With AI operation, libraries can carry out tasks very fast, compared to when being done by human beings. AI is handy in discovering unexplored concepts, such as outer space and reduces human errors in library operations. Liu (2011) argued that academic libraries can develop artificial intelligence in libraries using expert systems in the reference section to recommend to users the library materials to meet their queries. The potential merits of chatbots have been reported in some studies, based on their 24/7 availability to respond to user inquiries and ability to deal with scale or requests (McNeal and Newyear, 2013; Vincze, 2017). Chatbots have a wide range of potential uses in libraries: the most obvious being to respond to routine information requests or even handle the early stages of complex reference enquiries.

The Library Services AI Technologies are Deployed to Render

AI is not one technology but a bundle of technologies with general applications across many sectors of activity. Some are suitable for reference services, cataloguing activities, collection development services, readers' services, and so on. In this question, respondents were asked the various library services the AI technologies are deployed to render in the library. The various responses were quoted directly as reported from the various libraries that have adopted AI technologies.

At the University of Johannesburg, South Africa, they use AI technologies to give students information and answer questions. In the words of the librarian:

> We have a library app, a chatbot. We also use Online plagiarism game that works on AI in the background. We also teach students how to use ChatGPT in their assignments when we teach Info Literacy courses.

At the Vaal University of Technology, South Africa, AI technology such as RFID (Radio Frequency Identification) is used to render library services. In the words of the librarian - *we are using RFID self-check-out machine for books. This machine assists user to check the books in and out for themselves.*

At the Rhodes University, South Africa, they use AI technologies in assisting the user services section to answer queries relating to the library services. The responding librarian wrote:

> We do have a chatbot on our library website as a tool to answer services-related information and is from LibApps. LibKey from ThirdIron is also another service we have that has some AI capabilities of linking technology that lets scholars to access both open access publications from the public web and full-text academic journal articles to which the library subscribes.

Response from North West University (NWU), South Africa revealed that the NWU Library has adopted Artificial intelligence technologies in library service delivery. The responding librarian reported that the physical robot and chatbot is under construction which will be used as library assistant in the library. In the words of the Librarian:

> The physical robot will be used as library assistant. It will provide support and respond to basic questions to the patrons. It will also be used as a marketing tool for the library and the institution as a whole. The chatbot will be used to provide online support to the patrons 24/7.

Response from University of the Free State, South Africa revealed that they have adopted AI for tagging books in all the branch libraries, and AI language tool such as Grammarly. According to the responding librarian:

> We are currently implementing RFID technology, the first phase was tagging books in all our libraries, that is done and we are now in the process of rolling out RFID technology fully.

Response from University of the Witwatersrand, South Africa revealed that they have adopted Chatbot to answer general library queries, and AI tool for statistics evaluation and recommendations. In the words of the responding librarian:

> We have acquired a tool for statistics evaluation and recommendations. Others are in the pipeline like RFID (radio frequency identification) material coding and the change in the security system.

At the University of Pretoria, South Africa, responses revealed that the library uses robot for several services. According to the responding librarian**:**

> The robot, named Libby, has over 60 sensors, cameras and software integration which it uses to receive commands or request. The robot is able to perform a range of services which include repetitive task like answering of users' query, assisting in the charging and discharging of library materials as well as entertainment of library users. Beyond carrying out repetitive tasks, the robot is able to process survey data since it's able to connect to online cloud through WIFI.

At the University of Lagos Library, Nigeria, the study found that the library had adopted AI technology like robots for client services. In the words of the responding librarian:

> The client services robots were acquired with the aim to assist librarians in library operations, such as answering of directional and ready reference questions posed by library users. The library users are able to interact with the robots using the voice recognition feature of the robot. Beyond answering of reference queries, the robot also serve as a knowledge base for cataloguing information of library materials, as such, library users are able to query the robot to determine the availability or otherwise of a particular information resource in the library. In addition, the robot at the University of Lagos Library has the capability to take user statistics thus, providing library

management with accurate or near accurate user data for planning and decision making. The robot also possesses other unique features which include research data management, research assistance, surveillance abilities and entry validation intelligence. The robot is able to render user specific services and consequently adding value to the library services.

Responses from the various university libraries showed that they have adopted AI technologies to support rendering different library services. Although, the adoption level is still at a very slow in Africa. For university libraries to fully deploy AI for meeting their various service needs, they need to first adopt and implement these tools. According to Ajani, et al. (2022), implementing artificial intelligence (AI) in university libraries can increase the effectiveness of library operations in general and reference services in particular. Several studies have argued that AI can be used in the area of library security, as university libraries are now deploying AI-based facial recognition technology to track and monitor users, particularly service areas (American Library Association, 2022; Datagen, 2022).

The findings from the present study on the use of AI to support rendering library services agrees with Al-Aamri and Osman (2022) who studied the potential of artificial intelligence to enhance library operations and services and that robots will assist in providing library services. Similarly, Vysakh and Babu (2020) studied the use of robots in libraries and found that most jobs carried out in libraries can be done by robots. It has become imperative to note that the use of AI in academic libraries mostly in Africa as it is adopted in developed countries will aid in the delivery of information services as well as better search, which will thrill both library staff and users due to the faster access to information.

Challenges Encountered in Adopting AI in University Libraries in Africa.

Regarding challenges associated with the adoption of AI in university libraries in Africa. Respondents were asked to mention the challenges they encountered. The responses were sorted according to similar themes and grouped together. Results presented in the Figure 1.

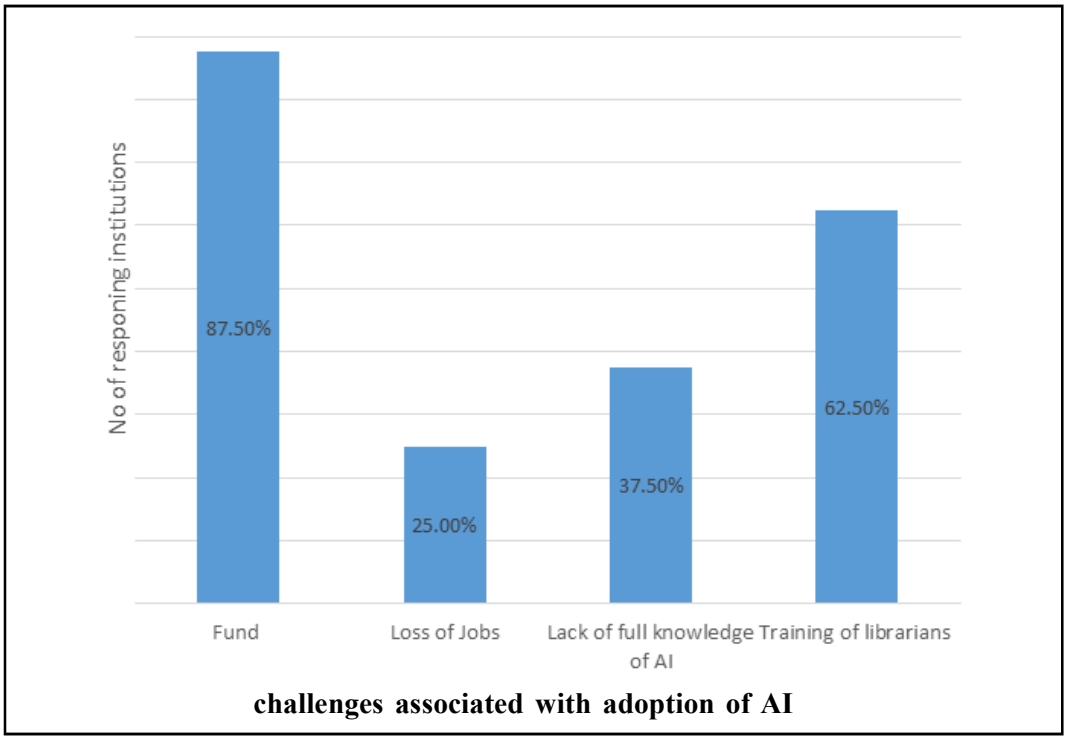

Figure 1: Challenges associated with adoption of AI

Out of the responding eight institutions, 7 (87.5%) mentioned lack of funds to acquire the AI tools as a challenge. This was followed by 5 (62.5%) responding institutions who mentioned training needs of librarians. This shows that availability of funds and the training and re-training is needed before adoption and implementation of AI technologies in university libraries in Africa. One of the respondents wrote:

> The cost of designing these different things has been the biggest challenge. The second challenge is getting librarians to understand how to use the technology so that they can teach students. Another mentioned - The challenge was to choose between procuring a robot or in-house building of the robot. Both options come with huge risks however we chose the latter due to financial constraints and also the support and maintenance we hoped we will get internally.

The third most mentioned challenge was lack of full knowledge of AI. This was mentioned by 3 (37.5%) out of the eight responding institutions. Reflecting on the role of libraries in an AI world, IFLA-FAIFE, (2020) statement emphasised on the importance of equipping library staff and library and information science students with a basic understanding of AI, and pointed out the role libraries can play in educating the general public about AI. It is interesting to see conferences and workshops held recently concerning AI in the libraries. This will no doubt equip librarians with the knowledge and skills needed to use AI technologies in libraries in Africa. One of such conferences in Africa was "Artificial Intelligence Symposium: 3rd IFLA Symposium on Artificial Intelligence, North West University, Potchefstroom, South Africa, held 5-7 September, 2023". Another is "Transforming LIS Education through Digital Technologies and Collaborative Strategies, with emphasis on Artificial Intelligence, organised by Nigerian Association of Library and Information Science Educators (NALISE), at the University of Uyo, Nigeria, held Nov. 6-10, 2023." The need to attend conferences and workshops on Artificial Intelligence was emphasised by one of the respondents when he wrote:

> We are still doing some research and attending workshops to guide us in what best approaches to follow when adopting AI.

Conclusion

The qualitative study revealed that only few university libraries in Africa adopt AI technologies such as Chatbot, ChatGPT, LibKey from ThirdIron, robots, RFID technology and Grammarly. These AI technologies are used to render different library services like answering of directional and ready reference questions posed by library users, serving as a knowledge base for cataloging information of library materials, self-check-out machine for books, used as a marketing tool for the library, tool for statistics evaluation and recommendations, assisting in the charging and discharging of library materials, and so on.

Challenges such as lack of funds to acquire the AI tools, training of librarians, and lack of full knowledge of AI were the most mentioned by the responding institutions in Africa as challenges associated with adoption of AI in the library. The adoption of AI technologies for assisting library activities has been a boon in the Western world more than in Africa. Therefore, the findings of this present study will inform librarians, most especially in Africa, the way in which AI technologies can be integrated for supporting various library operations

The intensive pressure on librarians to provide high quality services to library users due to information explosion in our present society have led to incorporating modern technologies. Artificial intelligence technologies have penetrated into almost all the fields of life including libraries which can do things even human incapable of with higher efficiency. The adoption of AI technology in academic libraries is setting a new level of efficient and effective library services delivery. Librarians in Africa have begun to adopt artificial technology in some specific areas of their respective libraries to meet with current global trends.

Recommendations

Based on the findings, the following recommendations are made.

- Librarians should be exposed to training and retraining in the use of artificial intelligence in delivering library services;
- Artificial intelligence should be introduced in all the sections of academic libraries so as to ease efficient and faster library operation and service delivery.
- There must be proper policy formulation and implementation prior to, during and after the adoption of AI in African academic libraries.

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Perceptions on the Utilisation of Archives in Enhancing Research in Higher Educational Institutions

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Abstract

When used effectively, archives can stimulate creative thinking and the production of new information. The archives at Higher Educational Institutions (HEIs) are priceless knowledge repositories that preserve and make accessible scholarly materials, historical records, and cultural artefacts vital for study, instruction, and developing a vibrant academic community. This study's methodology is a systematic literature review completed by compiling pertinent works from other academics, from textbooks and journals. Although a substantial body of literature has been written about the value of archives in advancing HEI research, little is known about the factors that have influenced researchers' opinions on the use of archives in HEI research. Even though previous research highlights the advantages and difficulties of using archives, a thorough examination of how these factors impact researchers' perceptions regarding archives use is lacking. For this study, the social constructionist theory was used to understand better how archives are perceived as a means of advancing research in HEIs. The study also suggests recommendations for improved archiving.

Keywords: Archives, Research, Higher Education, Higher Educational Institutions (HEIs)

Introduction

As stated by Järvelä et al. (2022), archives are a vital source of data for higher educational institutions (HEI) researchers. Scientific, historical, and cultural materials found in archives can guide and stimulate creative research (Sternfeld, 2011). However, some obstacles and variables affect how archives are viewed and how valuable they are for research, making using archives in research not always straightforward (Knake, 2023). It has long been acknowledged that archives are an essential data source for scholars working in higher education institutions (HEIs), offering distinct perspectives on past occurrences, cultural customs, and scientific breakthroughs (Chrysanthopoulos et al., 2023).

There are several interpretations of the word "archives," one of which is connected to the idea of a collection. Within this context, archives pertain to methodically arranged and carefully selected sets of historical records, papers, or other items vital for scholarly research or historical documentation (Corrado and Sandy, 2017). In addition to providing researchers and scholars with invaluable insights into the historical narratives being written, and the progression of knowledge over time, archives, as collections, are essential for maintaining the cultural and institutional memory of societies, institutions, and communities. A few examples of the many areas in which archives are essential to society are health, human rights, and land claim proceedings. Mainly, HEIs oversee safeguarding and maintaining their institutional histories.

Archives are also repositories of historical documents that have been kept for their historical, cultural, or scientific significance. They can either be private or public, and they are frequently arranged

according to the organisation that made them or by its subject matter. According to a 2008 Council on Library and Information Resources report, archives offer researchers some advantages. Among these, are primary source materials that offer distinctive perspectives on historical events, cultural artefacts, and institutional histories. Primary sources are crucial because they give historical context and enable researchers to conclude. Moreover, contextual information from archival materials aids in researchers' comprehension of the historical and social settings in which objects and events took place. Details about the individuals involved, the period, and the prevailing cultural norms and beliefs can all be considered contextual information.

Regarding diversity, archival materials present a range of viewpoints not accessible through alternative research techniques. They offer a glimpse into the lives of individual s-such as women, people of colour, and marginalised groups - who might have been left out of the historical record. Researchers can now more easily access archival materials remotely, thanks to digitising archives (Piggott, 2012). Moreover, archives can act as a starting point for interdisciplinary research, bridging gaps in knowledge.

Additionally, oral history plays a crucial role in preserving the stories of marginalised or underrepresented communities, and the lack of such narratives can perpetuate historical inequalities in archival records (Barros, 2016). Overcoming this challenge requires intentionally collecting and incorporating oral histories into archival practices, ensuring a more inclusive and comprehensive portrayal of the past (Ma, 2020). In addition, navigating archives can be complex and time-consuming, requiring technical knowledge and skills (Cook, 2013).

Ethical and legal considerations, such as privacy and copyright, can also pose challenges for researchers utilising archives in their work (Flinn, 2011). Considering these challenges, there is a need to enhance the perception of archives and their value in research among scholars in HEIs. By doing so, researchers can more effectively utilise archives in their work, unlocking the potential for interdisciplinary and innovative research (Carbajal and Caswell, 2021). This requires collaboration and dialogue between researchers and archivists and developing strategies that promote access, navigation, and ethical and legal considerations (Ventresca et al., 2017).

Statement of the Research Problem

Although the potential advantages of utilising archives in HEI research are acknowledged, little is known about how these institutions' researchers viewed and used archives. Although some studies have looked at archives in particular fields, like literature or history, there isn't much thorough research on using archives in HEIs for various fields (Butterworth, 2017). Furthermore, inadequate information is available on the variables influencing how archives are viewed, their importance in research, and methods for improving their use. A research agenda for critical archival studies is presented by Carbajal and Caswell (2021) to question conventional wisdom and advance inclusive, socially conscious archival practices. According to the researcher, archives can act as hubs for social justice and resistance, and critical archival studies can help create societies that are more just and equitable (Carbajal and Caswell, 2021). The paper emphasises the need for more study on the relationship between archives and social justice concerns and the function of archives in creating power and knowledge.

Aim of the Study

The present article aims to critically review the perception of the utilisation of archives in enhancing research in HEIs.

Research Question

What are the perceptions of the utilisation of archives in enhancing research in HEIs?

Significance of the Study

This in-depth investigation into how HEIs perceive the use of archives to support research has the potential to alter practices and policies related to the archival environment significantly. The study can uncover critical insights into the current issues, levels of awareness, and expectations regarding archival resources by exploring the viewpoints of researchers, academics, and other stakeholders (Eastwood, 2015). This vital data, forms the basis of evidence-based

policymaking, pointing out deficiencies and developing focused plans to improve accessibility, encourage cooperation, and remove technology obstacles (Pugh, 2017).

The study results inform the creation of policies that address the various requirements of researchers and guarantee that archival environments are vibrant, welcoming, and conducive to scholarly research initiatives (Millar, 2017). Furthermore, this study contributes to developing quality standards and ethical considerations by illuminating perceptions regarding training, support, and the representation of diverse perspectives in archival collections. In the end, perceptions catalyse positive change, promoting a more responsive, user-centric, and progressive archival environment in higher education.

Theoretical Approach for the Study

This article adopts the theoretical framework of social constructionism to comprehend how perceptions of archive utilisation are constructed within the context of higher education institutions. According to the theoretical framework of social constructionism, our perception of reality is shaped by the social and cultural environments in which we live. This perspective holds that language, and social interactions are how knowledge and meaning are constructed rather than being fixed or objective. Cook (2013) contends that archives are essential to the social construction of research and that this process makes it what it is.

The researcher argues that various elements, such as researchers' disciplinary backgrounds, research questions, and personal experiences and biases, influence how they view archives. The significance of comprehending the social and cultural contexts in which archives are created and used is another point the researcher emphasises. Moreover, archives are critically analysed by Bawden and Robinson (2015) as social constructions, who contend that cultural norms and power dynamics shape archives. She argues that archives can become arenas of conflict and struggle when various groups try to rewrite history through archival materials. Additionally, the researcher highlights how crucial it is to comprehend the ethical and political aspects of archival work and the social interactions and interactions with peers, mentors, and fellow researchers, all of which significantly impact participants' perceptions. Yale (2015) explained the social construction of knowledge through the lens of archives, arguing that archives are not neutral information repositories but are shaped by social and cultural factors.

The researcher suggests that researchers' perceptions of archives are influenced by their disciplinary backgrounds and the prevailing epistemological frameworks in their fields. Bawden and Robinson (2015) opined that social constructionism could provide insights into how researchers perceive the utilisation of archives in enhancing research in HEIs. According to this theoretical framework, perceptions of archives are not fixed or objective but constructed through social interactions and language. Here are some examples of how social constructionism can inform our understanding of perceptions of archives in higher education research. The value of archives is socially constructed:

According to social constructionism, the value of libraries is not inherent in the materials themselves but rather is constructed through social and cultural factors. The prevailing epistemological frameworks may shape researchers' perceptions of the value of archives in their fields and broader cultural attitudes towards history and knowledge production (Azim et al., 2018). Furthermore, it is germane to state that perceptions of archives are constructed through language, and social constructionism emphasises the role of language in shaping our understanding of reality. Researchers' perceptions of archives may be shaped by the language used to describe them and the narratives and discourses surrounding their use.

Applying social constructionism as a theoretical framework allowed the challenge of long-standing assumptions and preconceived notions regarding archive utilisation in HEIs. The researcher uncovered instances where researchers' perceptions were contingent upon specific social contexts, highlighting that these perceptions are not universally held truths. Social constructionism challenges the notion that perceptions of archive utilisation are static and universally shared. Instead, it recognises that these perceptions are dynamic and constructed within specific social and cultural contexts. For example,

somewhere, researchers held the assumption that archives were primarily repositories of historical documents with limited relevance to contemporary research HEIs (Sabharwal, 2015). However, findings revealed that this assumption was not universally accepted in specific social contexts characterised by interdisciplinary solid collaborations, where researchers recognised the potential of archives to contribute to innovative research, thus challenging the prevailing assumption.

Perceptions of archive utilisation are contingent upon specific social contexts (Welch et al., 2011; Dobreva, 2018). For instance, researchers working within collaborative research environments viewed archives as valuable resources facilitating knowledge creation and cross-disciplinary research (Knake, 2023). In contrast, individuals in more isolated academic settings often believed that archives were remote and less relevant to their immediate research needs. This contingency in perceptions highlighted the role of social interactions and academic environments in shaping how individuals viewed archive utilisation (Pearce-Moses and Baty, 2005).

Social constructionism prompts the acknowledgement that the 'reality' of archive utilisation is socially constructed. What one group perceives as an essential research tool may be viewed differently by another. In this sense, no universally 'correct' perception of archive utilisation exists. Instead, perceptions are situated within specific social, cultural, and academic contexts, evolving in response to changing norms and practices. Caswell (2021) stated that applying social constructionism as the theoretical framework challenges the assumption of a monolithic perception of archive utilisation within HEIs.

The findings highlight these perceptions' dynamic and context-dependent nature, emphasising the need for interventions and educational strategies that recognise and accommodate this diversity in perceptions among academic communities. The lens of social constructionism enabled the recognition and embrace of multiple and diverse realities concerning archive utilisation within the diverse landscape of HEIs (Dobreva, 2018). This framework highlighted those stakeholders within unique social contexts held varying perceptions of archive utilisation.

Social constructionism fundamentally acknowledges that reality is not a singular, objective truth but a multi-faceted and socially constructed phenomenon (Pearce-Moses and Baty, 2005). This article exemplified revealing a spectrum of perceptions regarding archive utilisation within HEIs. Professors, researchers, librarians, and students, each positioned differently within the academic ecosystem, brought their perspectives to the fore. This diversity in perceptions illuminated multiple 'realities' about the role and value of archives in academic research (Sabharwal, 2015).

The review revealed that various HEI stakeholders had differing opinions about using archives due to their distinct social circumstances and positions. Professors tend to emphasise the pedagogical significance of archives because they are frequently involved in research and curriculum development. Conversely, scholars emphasised that archives can produce new research discoveries (Dobreva, 2018).

Students' perceptions were frequently in line with their immediate research and learning needs, but librarians and archivists, who served as guardians of archival collections, brought a preservation-focused perspective (Beetham, 2022). These differences demonstrated how people's roles and responsibilities within HEIs influenced how they perceived the use of archives.

Understanding different perspectives within particular social and contextual contexts is encouraged by social constructionism (Welch et al. Dobreva (2018); 2011). It acknowledged that people's conceptions of using archives were shaped by their roles and larger institutional, disciplinary, and societal contexts. Stakeholders have valid but differing perceptions due to these challenges and opportunities (Morris et al., 2014).

This framework acknowledged that every perspective adds to the larger conversation about the value and application of archives in higher education, allowing us to respect and consider the legitimacy of multiple and diverse realities. This understanding can guide more inclusive and situation-specific strategies.

Literature Review

Archives are pivotal in facilitating research within HEIs, providing an invaluable source of primary materials for various academic disciplines.

Nevertheless, the perception of archives' usefulness and relevance in research is a complex matter influenced by many factors. This literature review delves into synthesising the perceptions of users on the use of archives in HEIs research in enhancing research in HEIs.

Archives

Academics employ archives to obtain primary sources, which offer firsthand and authentic accounts of historical events and societies (Walsham, 2016). Primary sources for historical, social, and cultural studies can be found in archives, which are a vital source of data for researchers. Researchers can access these resources archivists gather, preserve, and make available. The public's access to and preservation of historical records depends heavily on archives. While digitisation efforts improve accessibility, archivists use a variety of strategies to ensure the long-term preservation of documents and artefacts (Punzalan and Caswell, 2016). Effective use of archival materials requires proper organisation and description.

To provide finding aids that assist researchers in locating pertinent materials, archivists employ standardised systems such as the Encoded Archival Description (EAD) (Caswell, 2021). To create narratives and interpretations of the past, historians analyse primary sources from archives, including letters, diaries, and official documents (Punzalan and Caswell, 2016). When researching one's family history, archives are a priceless tool. Archives frequently contain birth certificates, census information, and immigration records, that can be used to trace one's ancestry (Schmidt, 2011). While government officials may use archives for administrative reasons, lawyers and other legal professionals can use them to locate past legal precedents.

Archives in HEIs Research

Because it can give scholarly investigations a rich historical context and an empirical foundation, archival research has attracted much attention, especially in the higher education sector. With the help of archives containing a vast range of materials like records, documents, datasets, and more, scholars can investigate, evaluate, and interpret historical and modern educational phenomena. This methodological approach makes it easier to fully explore the nuances and complexity of educational theories, practices, and policies by offering a reliable source of empirical, qualitative, and quantitative data (Kezar, 2006).

The use of archives in research on higher education provides a means of closely examining and comprehending the historical development of educational practices, policies, and theories. By giving insights into the socio-political, economic, and cultural elements that have shaped and influenced educational practices and policies over time, it offers a lens through which the evolution of educational paradigms can be traced (Ma, 2020). Additionally, researchers can explore the historical background through archival research, which lays the groundwork for securing current studies. Archives facilitate a nuanced understanding of higher education research's historical, social, and cultural dimensions. They are not just repositories of historical data.

User Perceptions of Archives in HEIs

Archives are virtual information repositories for scholars, researchers, and knowledge producers. They provide primary source materials for understanding historical events, cultural trends, and social movements. Archives are also crucial for producing new knowledge in various fields, including history, sociology, anthropology, and literature. However, the perception of archives and their utilisation in research is not a neutral process.

Archives are essential sources of historical, cultural, and social information that can enrich research in HEIs. However, the perception of the usefulness and relevance of archives in research can vary widely among researchers and scholars. Several factors can influence this perception, including technological advancements, political and social contexts, power relations, digital humanities approaches, archival representation, archivists' advocacy and outreach efforts, professional discourse, and contextualisation.

Advancements in technology have revolutionised the way researchers access and use archives. Manžuch (2017) provided a comprehensive overview of the changes and challenges facing archives and records management in the digital age. The researcher argues that the perception of the

usefulness of archives in research is influenced by technological advancements, which have made it easier to access and use archives remotely, eliminating the need to visit physical archives. This has increased awareness of archives' importance in research, particularly in the digital humanities. However, digital archives also raise concerns about the authenticity and reliability of digital records, with consequences for researchers' perception of their usefulness.

The political and social contexts in which archives are created and preserved can significantly influence researchers' perceptions. Harrison (2010) examines the political dimensions of heritage preservation and use. The book argues that power relations and social inequalities shape the perception of archives in research. Archives may be seen as valuable or irrelevant depending on their alignment with the interests of dominant social groups. Political and social contexts can also influence the perception of archives in research. Archives are often created and preserved to reinforce dominant national identity and historical narratives. Thus, archives aligning with these narratives are more likely to be perceived as valuable, while those challenging or contradicting them may be dismissed or ignored. Similarly, archives that document marginalised groups or histories may be undervalued or neglected, further perpetuating social inequalities and power relations.

Theimer (2012) emphasises the importance of contextualising archival materials in research. How researchers situate these materials within broader historical and cultural contexts influences their perception of archives. This contextualisation is vital for practical use, as archival materials must be understood within their historical and cultural milieu to yield accurate insights. As Yakel (2003) discussed, archival representation plays a role in shaping perceptions. The researcher argues that the perception of archives in research is influenced by how they are represented, affecting their visibility and accessibility to potential users. How archival materials are described, organised, and accessed can affect their visibility and accessibility to potential users. Effective archival representation can increase awareness of the value of archives in research, while poor representation can undermine the perceived usefulness of archives (Ghaddar and Caswell, 2019).

How archives and archivists are framed and presented in professional literature can influence how researchers perceive their relevance and usefulness (Theimer 2012). The researcher uses discourse analysis to examine how professional literature shapes the perception of archives and archivists. They argue that the perception of archives in research is influenced by how they are framed and presented in professional discourse, which may reflect broader cultural and social values and norms. This underscores the importance of analysing professional discourse to understand the broader cultural and social values that shape perceptions of archives in research, shaping the perception of archives and archivists.

The framing and presentation of archives and archivists in professional literature reflect broader cultural and social values and norms, influencing how researchers perceive their relevance and usefulness in research (Caswell and Cifor, 2016). Cultural norms surrounding history, knowledge production, and the role of archives shape perceptions. According to Downey (2015), cultural norms influence the perception of utilising archives in research. In some cultures, archives are revered as essential knowledge repositories; in others, they are considered irrelevant to contemporary concerns Evans et al., (2015).

These cultural attitudes influence researchers' assessments of archives' value. Broader cultural attitudes towards history, knowledge production, and the role of archives in society shape the perception of archives. In some cultures, the past is viewed as a source of wisdom and guidance, and archives are crucial knowledge repositories that must be preserved for future generations. In other cultures, the past is viewed as irrelevant to the present, and archives are considered irrelevant to contemporary concerns. Cultural attitudes towards archives can influence how researchers perceive their value and role in research. For example, in many Western countries, archives are viewed as essential sources of evidence for historical research. In contrast, some African countries view archives as colonial instruments of control and oppression.

Archivists' advocacy for increased resources can promote archives' integration into research; outreach efforts and collaboration are also crucial, with considerable influence on the perception of archives in research (Downey, 2015). Archivists play

an essential role in promoting the use and integration of archival materials in research by collaborating with researchers and disciplines, developing outreach programmes, and advocating for increased resources and support for archives (Ghaddar and Caswell, 2019). Furthermore, Tesar (2015) narrated that disciplinary backgrounds are among the most significant factors influencing the perception of archives' utilisation in research. Different academic disciplines have different methodologies, research questions, and epistemological frameworks shaping how researchers perceive archives. For example, historians are often concerned with constructing past narratives based on primary sources, such as archival materials. They view archives as essential sources of evidence to support their arguments and understand the historical context.

Researchers' experiences with archives can shape their perceptions of their value and role in research. For example, a researcher who has had a positive experience using archives may view them as valuable sources of information that can enrich their research. They may develop positive attitudes towards archives, and their perceptions may influence their research practices. In contrast, a researcher who has had a negative experience using archives may view them as unreliable or difficult to work with. They may develop negative attitudes towards archives, and their perceptions may influence their research practices. These factors shape the way researchers perceive archives and influence their research practices. Understanding the factors that influence the perception of the utilisation of archives in research is essential for developing effective strategies for enhancing their role in knowledge production. Researchers and archivists can work together to identify and address these factors to ensure that archives are valued and utilised in ways that are relevant and meaningful to researchers. It is also important to note that contextualisation is an essential factor influencing the perception of archives in research. Archival materials must be situated within broader historical and cultural contexts to be effectively used in research. Without proper contextualisation, archival materials may be misunderstood or misinterpreted, leading to incorrect conclusions and undermining the perceived usefulness of archives (Landau, 2018; Sternfeld, 2011).

Literature Synthesis

Archives are a vital source of primary materials for many academic disciplines, making them essential to HEI research. However, opinions about their usefulness in research are complex and shaped by various factors. Because archives provide firsthand accounts of historical events and societies, they are invaluable for researchers in various fields, including history, sociology, and anthropology. Although access to archives has increased due to digitisation, problems like copyright violations and access limitations still exist. Political and social contexts, technological developments, and the portrayal of archives by professional literature also influence researchers' perceptions of archives. Personal experiences with archives and cultural norms further shape researchers' perspectives. The advocacy and outreach activities of archivists are vital in advancing archives. Researchers' perceptions are also influenced by their disciplinary backgrounds because different academic fields approach archives with different goals and methods. Contextualising archival materials correctly is essential because failure to do so increases the possibility of erroneous interpretations and conclusions.

Methodology

The study adopted the systematic literature review (SLR), a rigorous and structured approach to identifying, analysing, and synthesising existing research on a particular topic. The study was carried out from June to October 2023. It critically appraises all relevant studies conducted on a specific subject, intending to provide a comprehensive summary of the available evidence (Dobreva, 2018). There is a detailed breakdown of the methodology, including search terms, databases used, inclusion/exclusion criteria, strategies for addressing publication bias, and data extraction and synthesis methods used.

Relevant search terms were carefully chosen to capture all relevant literature. This article's search terms include Archive utilisation, Archives in higher education, perceptions of archives, research in HEIs, archives and academic research, and library and research collaboration. Synonyms and related terms were considered to ensure a comprehensive search. Boolean operators (AND, OR) assisted in combining

these terms logically. The methodology also involved combining academic databases relevant to the topic, such as PubMed, Scopus, Web of Science, ERIC, JSTOR, ProQuest, and Google Scholar (for grey literature). The choice of databases used is based on their coverage of the above search terms and education and social sciences literature related to the article. The inclusion/exclusion criteria were also adopted as part of the methodology. These criteria ensured that the selected studies met specific quality and relevant standards, defined studies considered for inclusion, and determined which studies were excluded from this article (Piggott, 2012; Dobreva, 2018). The inclusion criteria comprise relevance to the research problem, the publication type, citation index and the outcome measures. The relevance criteria enable the selection of articles directly related to the research problem and topic of the article. It clearly defined the review's scope, specifying the research problem's critical aspects. The publication type is typically a systematic review, which includes only peer-reviewed publications. However, the publications used are based on the research problem and available evidence, grey literature, conference papers, and reports.

The exclusion criteria adopted as part of the methodological approach involved excluding databases based on content irrelevance, publication status, citation index and outcome measures. Studies that do not directly address the research question or topic were excluded from this category. This criterion ensures that the review remains focused on the intended subject. As per the publication status, exclusion criteria include studies that have not undergone peer review or have not been published by a reputable source.

Also, articles that do not involve the relevant intervention or exposure in terms of citation were deleted, and articles not reported on the specified outcome measures or endpoints were excluded because they were unrelated to archive utilisation in HEIs or lacked empirical research. This helps to minimise bias and ensures that the studies selected for inclusion are the most relevant and of sufficient quality to address the research question. Studies conducted in HEIs include research on the perceptions of archive utilisation, studies published in peer-reviewed journals, books, and conference proceedings, and research conducted in various geographical regions to capture diverse perspectives. The researcher expunged grey literature sources to mitigate publication bias and disclosed any limitations associated with publication bias within the review. A systematic approach was employed for data extraction to collect pertinent information from each included study. This encompassed capturing study characteristics (e.g., author, publication year, methodology), key findings, and themes relevant to perceptions of archive utilisation within HEIs. In the data synthesis phase, a thematic analysis was conducted to discern recurring themes and patterns across the included studies (Ventresca et al., 2017).

The methodology for the analysis commenced with the Internet literature search of related topics to the pertinence of information and library science to sustainable development. In carrying out this task, Scopus, Web of Science, JSTOR and Google platforms were utilised in the literature search, and after that, a total of 97 articles were generated. The second step involved the search by theme, of which a balance of 86 articles was retrieved from the Internet search. Step 3 involved the search by publication, giving credit of 69, and consequently, 18 paper abstracts and duplicate articles were removed. This led the researcher to proceed to the second phase. Advanced literature selection was carried out in the second phase, including the general activities of the articles, methodological aspects of the articles, themes, and topics in the literature. Finally, 51 articles were used for this review article.

This systematic review methodology ensures a comprehensive and transparent approach to investigating perceptions of archive utilisation in HEIs. It allows for the systematic identification and synthesis of existing research, helping to advance our understanding of this critical topic, while minimising bias and ensuring the reliability of the findings.

Key Findings

Figure 1 provides some of the highlights of the literature review on the use of archives in HEIs research, from which the critical findings concerning the broader issues of utilisation, challenges, potential, directions, and perceptions are excised.

Figure 1: Literature highlights

Perceptions of Utilisation

For historical and qualitative research, archives are a rich primary data source that is priceless (Mills, 2019). Researchers frequently delve into archival materials to obtain context, confirm findings, and strengthen the validity of research findings (Allison-Bunnell et al. The opinions of educators, researchers, and students about the use of archives in research differ. According to some researchers, archives are invaluable because they offer a wealth of untapped data (Piggott, 2012). On the other hand, because of the materials' sheer volume, accessibility, and decipherability, some scholars find conducting archival research intimidating (Teichler, 2013). Additionally, Ramirez (2015) described the advantages of using archives in higher education institutions by highlighting the fact that archives give researchers unrivalled access to primary, historical, and cultural data, guaranteeing accurate and impartial insights into the past and preserving materials for future study (Ramirez, 2015). Nevertheless, Welch et al. (2011) described the obstacles to using archives, such as limited access to materials, an absence of digitisation, and challenges utilising archival systems. These problems may make it more difficult to use archives effectively for academic and research purposes. It is also critical to remember that digitising archives offers a big chance to improve accessibility and research use (Butterworth, 2017; Azim et al., 2018).

Discussion and Synthesis of Findings

This paper summarises the material provided, emphasising archives' crucial role in HEIs and the differing opinions and difficulties of using them for research. It emphasises the importance of viewing the world through a social constructionist lens to comprehend how these perceptions are formed, how flexible they are, and how cooperative actions can lead to positive change. In addition, the conversation looks at methods archivists can use to raise researchers' knowledge of and appreciation for archives, which will eventually help to promote their use and importance in research at HEIs. Numerous academics have pointed out that archives are essential for recording historical events and safeguarding knowledge for upcoming generations (Giannachi, 2023).

The study concluded that these priceless primary material sources make it easier for researchers to access original documents and artefacts. This allows them to investigate the historical context without being constrained by the potential bias present in secondary sources of information, giving them firsthand knowledge of historical events, cultural practices, and societal issues (Allison-Bunnell et al. As Ramirez (2015) suggested, the results also demonstrate archives' critical role in safeguarding historical and cultural materials for future study and providing insights into societal, cultural, and economic changes over time. Notably, access to archives is available.

Conclusion

Archives are crucial because they give researchers at HEIs access to primary source materials frequently unavailable elsewhere. Nonetheless, researchers have different perspectives on and uses for archives in their work. While some researchers may not be aware of archives or have the requisite expertise to use them efficiently, others may consider archives unimportant or challenging. The present review has explored the complex domain of attitudes related to archives in higher education institutions. The research's findings have shed light on a fundamental fact: attitudes toward using archives are dynamically created within particular social and cultural contexts rather than remaining static.

This research supports the ideas of social constructionism and acknowledges that these attitudes are not set in stone. Nevertheless, they are flexible and amenable to change via dialogue, language, and cooperative efforts. We have learned more about the complex ways archives are used in higher education institutions using the social constructionist lens. It has highlighted the perspectives among stakeholders in the academic ecosystem while underscoring the influence of language, cultural norms, and social interactions in forming these perceptions. These revelations set the stage for more positive and inclusive methods of using archives in higher education institutions. To overcome these obstacles, archivists can employ several techniques to raise researchers' understanding of and appreciation for archives.

Recommendations

Based on the challenges and strategies discussed in the previous sections, the following are recommendations for improving the perception and utilisation of archives in the enhancement of research in HEIs:

- Promote Inclusive Language and Discourse: HEIs should embark on initiatives that encourage inclusive language and positive discourse when discussing archives. This transformation should extend to pedagogical practices, with instructors using language that emphasises the dynamic nature of archives as resources for knowledge creation. We can gradually reshape perceptions by reshaping the way we talk about archives.
- Foster Collaborative Efforts: Recognising that collaborative interactions influence perceptions, HEIs should promote cross-disciplinary collaborations. These efforts should involve students, faculty, librarians, archivists, and other stakeholders. Interdisciplinary projects can serve as fertile ground for stakeholders to collectively explore the potential of archives in diverse research and learning contexts.
- Raise Awareness and Carry out Education Campaigns: Awareness and education campaigns should be launched within HEIs to provide stakeholders with a comprehensive understanding of the value of archives. These campaigns should target students, researchers, faculty, administrators, and librarians. Workshops, seminars, and online resources can be instrumental in disseminating information about the richness of institutional archives.
- Archival Advocacy: HEIs should engage archivists and librarians as advocates and ambassadors for archive utilisation. These professionals can actively participate in academic communities, share their expertise, and collaborate on research projects. By doing so, they can demystify archives and demonstrate their potential to enrich research and learning experiences. Archivists should emphasise the importance of archives in research and their unique contribution to knowledge production.

- Curricular Integration: HEIs should incorporate archive utilisation into curricula across disciplines. This integration should emphasise the practical relevance of archives in students' academic journeys. By weaving archives into coursework and research projects, HEIs empower students to explore archives as valuable resources, thus reinforcing more positive perceptions.
- Oral History: Archivists should also consider the importance of oral history as a valuable resource in complementing archival collections by providing insights and narratives that may otherwise be missing from traditional written records. It bridges gaps in historical documentation, offering a more comprehensive and nuanced understanding of events, perspectives, and experiences.
- Foster partnerships with other institutions: Archivists should foster partnerships with other institutions, such as libraries and museums, to promote the use of archival materials and increase access to them. With the adaptation of these strategies, HEIs can actively work towards reshaping perceptions of archive utilisation within their academic communities through the lens of social constructionism. The researcher acknowledges that perceptions are not fixed but are open to transformation, and by leveraging language, discourse, and collaborative actions, they collectively create a more enriched and inclusive landscape for archive utilisation within HEIs. By implementing these recommendations, archivists can improve the perception and utilisation of archives to enhance research in HEIs. This will contribute to a deeper understanding of history, enrich research, and advance knowledge in various fields.

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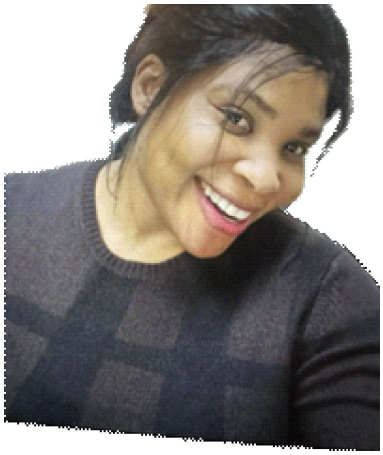

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Web Information-Seeking Behaviour of Undergraduate Students in a Private University in Malawi

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Abstract

This study aimed to investigate students' web information-seeking behaviour at Malawi Adventist University (MAU). A mixed methods approach was employed and underpinned by Wilson's (1996) Model of Information Behaviour. The sample size of the study was 166 level four undergraduate students at MAU. A questionnaire and an interview guide were used to collect data. The results of the study revealed that undergraduate students have web information needs for academic information 91(77%) and major web information sources were scholarly journals, scholarly databases, and Google Scholar 51(43%). Students mostly use simple search strategies such as keywords in searching for information 51(43%). The major challenge experienced by students was information overload 53(45%). The study has demonstrated that Web information is important for students at MAU for academic, personal, and health purposes. Therefore, the library at MAU should conduct tailor-made information literacy training sessions targeting undergraduate students to raise awareness of the existence of Web information sources and improve access and use.

Keywords: Information Needs, Web Information-Seeking Behaviour, Undergraduate Students, Malawi.

Introduction and Background

Higher education institutions invest in technologies to help students meet their web information needs. One such technological innovation is the provision of Internet services to facilitate access to information available on the World Wide Web (WWW) or simply the web. Wu et al. (2017) are of the view that the Web has grown into an important vehicle for information provision, dissemination and retrieval among students in universities. Nowadays, information seeking is not restricted to print-based sources only, as students have a selection of print and non-print sources for accessing a variety of information for academic and other uses (Tella et al., 2020).

Concept of Web Information-Seeking Behaviour

Information-seeking behaviour is a term used to describe ways in which human beings interact with information, especially how they seek and utilise

information (Olalekan et al., 2015). Wu et al. (2017) point out that the dominant sources of information for undergraduate students have been print sources. However, Wu et al. (2017) argue that there has been a huge shift in undergraduate students' preference for information sources used and their information-seeking behaviour from print to web-based information. This has been due to the availability of web information at the click of a button and its accessibility at any time. Gama, Chipeta and Chawinga (2022) argue that web information-seeking behaviour is one of the most popular web activities for undergraduate students, which provides an additional information channel and enhances learning and research in universities. Therefore, Makondo et al. (2018) state that web information-seeking behaviour is the totality of all sorts of behaviour portrayed by information seekers on the web or networked information sources.

Problem Statement

The web is positioned as the main source of information for students in universities (Makondo et al., 2018). Web information has been touted to be very important to students, as it provides up-to-date information, accessed at any time and allows concurrent access to the information resources (Makondo et al., 2018). Despite the numerous benefits of web information seeking, students experience some challenges when accessing information on the web due to poor computer and information searching skills (Tlakula and Fombad, 2017; Makondo et al., 2018). The library at Malawi Adventist University, Lakeview Campus, subscribes to various online resources, compiles print resources in open access and provides free Internet to students to facilitate their access to web information sources. The University Library, also provides information literacy sessions to equip students with information-searching skills. Despite these initiatives, students still over-rely on librarians and academic staff for their information searches, due to lack of time for teaching information literacy, students' lack of computer skills, and inadequate computers among others (Chaputula and Mutula, 2018; Chawinga and Zinn, 2015).

Through interactions with undergraduate students at MAU, the researchers noted that students struggle to search for information on the web and rely on library staff to assist. The challenges listed could have justifiably led the researchers to speculate that undergraduate students do not effectively use credible information sources to meet their information needs. These observations were made in public university libraries. Studies in private universities in Malawi are not known. Also, there are no known studies on the web information-seeking behaviour of undergraduate students in Malawi, as studies by Chipeta et al. (2019) and Thindwa et al. (2019), focused on the information-seeking behaviour of undergraduate students in general. Notwithstanding these observations, the study sought to gain a deeper understanding of the web information needs and web information-seeking behaviour of undergraduate students at MAU Lakeview Campus. The observations also made the researchers pose several questions: Are students aware of the information sources available on the web? Do they possess the necessary web information searching skills? What barriers do students face to accessing web information? To address these questions, the study sought to investigate the web information-seeking behaviour of undergraduate students at MAU Lakeview Campus to come up with interventions.

Objectives of the Study

- Establish the web information needs of undergraduate students at Malawi Adventist University at Lakeview Campus.
- Determine web information sources consulted by undergraduate students at Malawi Adventist University at Lakeview Campus.
- Identify web information searching strategies utilised by undergraduate students at Malawi Adventist University at Lakeview Campus.
- Find out barriers faced by undergraduate students in accessing and using web information at Malawi Adventist University at Lakeview Campus.

Literature Review

Globally, several studies have been reported on the web information-seeking behaviour of undergraduate students with a focus on web information needs, web

information sources, web information searching strategies and barriers to accessing and using web information. Studies by Howlader and Islam (2019), Oluwaseye et al. (2017), Ncwane (2016), Chawinga and Zozie (2016) and Makondo et al. (2018) discussed the web information-seeking behaviour of undergraduate students in developed and developing countries. A study by Howlader and Islam (2019) at the University of Dhaka in Bangladesh found that the web information needs of undergraduate students were academic information for assignments and examinations, health information, and job and career development information. The reasons for the similarity of these findings could be because web information is current and students were comfortable using it. Similar studies by Oluwaseye et al. (2017) in Nigeria, Ncwane (2016) in South Africa, Makondo et al. (2018) in Zambia, and Chawinga and Zozie (2016) in Malawi also reported on the web information needs of students such as academic information, personal development, and general information. Undergraduate students need web information to succeed in academic and social endeavours (Chawinga, 2016; Ifinedo, 2017).

Several studies have reported on the web information sources for students such as (Kumar and Gopal, 2020; El-Maamiry, 2017; Lo and Chu, 2015); . Obasola and Agunbiabe, 2016; and Okocha and Owolabi, 2020). A study by Kumar and Gopal (2020) also revealed that students accessed web information sources, such as Google (59.9%) and librarians and friends (26.4%.) Studies by El-Maamiry (2017) and Lo and Chu (2015) revealed that Google, Yahoo, and academic databases were the major sources of web information for undergraduate students. Similarly, a study by Dasgupta et al. (2017) in India also revealed that undergraduate students used the Internet as a major source of information.

In Africa, a study by Obasola and Agunbiabe (2016) in Nigeria, reported that undergraduate students mostly use Google and Yahoo as their information sources. Other sources, were Wikipedia and Facebook. Google and Yahoo were easier to use and had links to many sources of information on the Internet, while Facebook was used for current awareness and breaking news. A similar study by Okocha and Owolabi (2020) in Nigeria, also found that over 50% of undergraduate students in private universities considered electronic databases relevant, current, accessible, accurate and authoritative. In comparison with search engines, most academic journals in scholarly databases go through a rigorous peer review process, which makes the authority of these information sources guaranteed. However, scholarly databases are difficult to use and students lack the required information-seeking skills to access them (Okocha and Owolabi, 2020).

A quantitative study by Nadzir and Puteh (2017) in Malaysia, found that undergraduate students use both basic search strategies and advanced or systematic search strategies. Similarly, In India, a mixed method study by Kadli and Hanchinal (2015) revealed that undergraduate students can use simple search strategies and advanced search strategies such as Boolean logic in their information-searching endeavours. In Tanzania, mixed-method research by Isibika and Kavishe (2018), revealed that undergraduate students used both simple and advanced search strategies. It was further revealed that senior students used advanced search strategies due to exposure to information literacy training compared to junior students, who used simple search strategies, due to a lack of training in information literacy (Isibika and Kavishe, 2018). This phenomenon is supported by Ankrah and Atuase (2018) that robust online information literacy training is important for students to successfully search for information on the web. In sharp contrast, a mixed methods study by Tlakula and Fombad (2017) in South Africa revealed that 90% of undergraduate students used basic search strategies due to a lack of training in web information searching. The importance of information literacy training was emphasised by Bushman et al. (2021) and Tlakula and Fombad (2017), that information literacy skills courses need to be embedded in the university curriculum based on the needs of students in the use of the web.

Studies by Wang and Shah (2017) and Hong and Injeong (2017) in the USA, found that most undergraduate students lack user perseverance, navigational or query formulation, and skills to evaluate information and hence fail to use information from the web effectively. Umaru et al. (2018) suggested the need for qualified and friendly library personnel to support online users of e-library services with skills in navigating the web. Similarly, a

quantitative study by Jan et al. (2016) in Pakistan established that lack of information searching skills, due to inadequate information literacy sessions, was the major barrier undergraduate students faced when searching for information on the web. Information literacy training is focused on postgraduate students (Jan et al., 2016). In Malaysia, a quantitative study by Nadzir and Puteh (2017), also revealed that the majority of undergraduate students lacked training in searching the web, search query formulation, and evaluating web information. Similar findings were reported in a study by Bhat and Ganaie (2016) that lack of awareness and information evaluation skills were some of the impediments which affected the use of web-library services by students at the Parmar University of Horticulture and Forestry in India.

In Africa, studies by Thindwa et al. (2019), Chipeta et al. (2018), Ncwane (2016), and Okocha and Owolabi (2020), also revealed several barriers faced by students in accessing and using web information, such as information overload, inadequate computers in the library, power outages, lack of information seeking skills, lack of awareness, user unfriendliness of laboratory or library assistants and insufficiency of Web amenities. The barriers of lack of information-seeking skills and lack of awareness of web information could be attributed to a lack of exposure to ICTs early in life. Other barriers faced by students, were obsolete computers in the library, lack of information and communication skills of librarians to support students, slow Internet, lack of help from librarians and lack of minimal information literacy classes (Isibika and Kavishe, 2018).

Theoretical Framework

The study adopted Wilson's (1996) Model of Information Behaviour to explore the web information behaviour of undergraduate students at MAU Lake View Campus (Figure 1). The main principle in Wilson's (1996) Model of Information Behaviour, is that satisfying an information need, depends on feedback from information processing and use (Wilson, 2016). The 1996 model presents four information-seeking activities, such as passive attention, passive search, active search and ongoing search.

The model was chosen because previous studies by

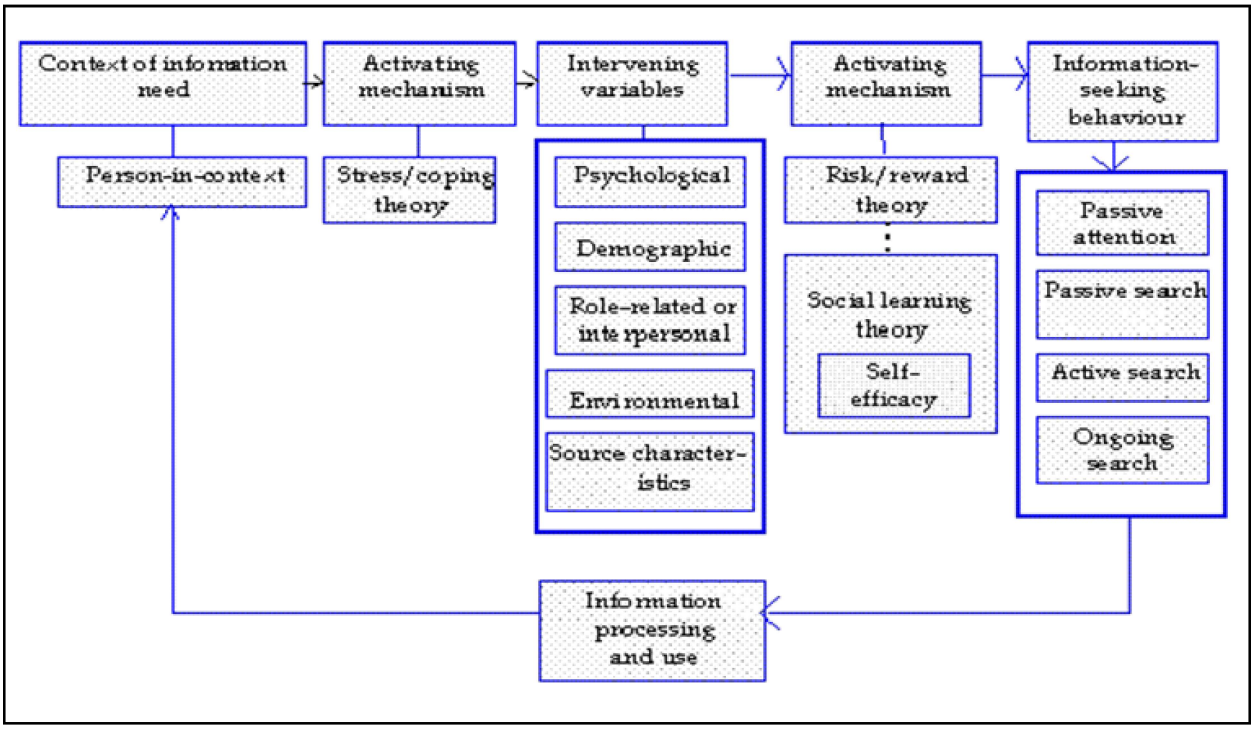

Figure 1. Wilson's (1996) Model of Information Behaviour

Oladunjoye (2018) and Azadeh and Ghasemi (2015) adopted the model to study the information-seeking behaviour of undergraduate students in countries, such as Nigeria and Iran. Secondly, the variables of the model, such as the context of information need, intervening variables, information-seeking behaviour, and information processing, and use , are directly related to the themes of the study, namely information needs, information sources, information search strategies and barriers to information seeking.

Methodology

The study was guided by a mixed methods approach, with a convergent design. Creswell and Creswell (2018) define convergent design, as a mixed methods study design, where both quantitative and qualitative data collection and analysis, are done in one phase and followed by merging and interpreting results. Both forms of data were collected at the same time from the undergraduate students at MAU and were merged in the interpretation of the results. The rationale for this approach was to collect qualitative data to complement quantitative results to provide a comprehensive understanding of the web information-seeking behaviour of undergraduate students at MAU. The study targeted 166 fourth-year undergraduate students from the Departments of Business, Education, Agriculture and Theology at Malawi Adventist University (MAU), Lake View Campus. The study focused on final-year undergraduate students, because they are at a stage that demands more services from the library to meet their information needs for research, assignments, and final examinations. A sample size of 166 was determined through a census approach, and if the population is less than 200, the entire population should be sampled (Israel, 2013).

A questionnaire with open-ended and closed-ended questions, was administered to 166 undergraduate students. In addition, fifteen (15) undergraduate students were conveniently interviewed, using an open-ended interview guide and the interviews lasted between 12 and 16 minutes. Similar results began to emerge at interviewee number 13, called data saturation. The questionnaire and the interview guide were divided into five sections: Section A collected data on the demographic profile of respondents, such as gender and programme of study; Section B collected data on web information needs; Section C collected data on web information sources, Section D collected data on web information search strategies, and Section E collected data on barriers in accessing and using web information. Validity and reliability of the findings, were achieved through triangulation of instruments and peer checking. Quantitative data were analysed using IBM Statistical Package for Social Sciences (SPSS) version 20, to generate descriptive and inferential statistics such as frequencies, percentages, and the chi-square test. Qualitative data were transcribed and analysed thematically, to generate themes and sub-themes as part of the major findings of the study (Denzin and Lincoln, 2018). The study was carried out between May and August 2022.

Results and Discussion of Findings

A total of 166 copies of the questionnaire were administered to fourth-year students and 118 responded, representing a response rate of 71%. According to Babbie (2020), a response rate of 60% is acceptable and is considered good for data analysis. Based on the benchmark above, the response rate attained in this study was considered adequate to continue with data analysis. Fifteen students were interviewed to obtain qualitative data, which was analysed thematically. The two datasets were then merged and quantitative results were presented, first followed by qualitative results in the form of narratives. Narratives from qualitative data were followed by a comment specifying how the qualitative results either confirm or negate the quantitative results.

Demographic Profile

The results show that the majority of undergraduate students were male 61(52%) while 57(48%) undergraduate students were female. As regards the programme of study, the most of the students enrolled in a Bachelor of Business Administration and Accounting 29 (25%) while the least number of students were enrolled in Bachelor of Art Theology 7 (%) degree programme. The results are displayed in Table 1.

Web Information Needs

Table 1: Demographic Profile (n =118)

Category	Frequency (*f*)	Percentage (%)
Gender		
Male	61	52
Female	57	48
Programme of study		
Bachelor of Business Administration and Accounting	29	25
Bachelor of Arts Education	21	21
Bachelor Science Agribusiness	17	14
Bachelor of Business Administration Marketing	14	12
Bachelor of Business Administration Management	14	12
Bachelor of Science Agriculture	12	10
Bachelor of Art Theology	7	6

The results presented in Table 2, show that the major web information need of undergraduate students was academic information 91(77%). The least information need was health information 3 (3%). According to gender, the results reveal that both male students 61(100%) and female students 57(100%) searched the Web for information to meet their information needs.

However, results from the interviews revealed

Table 2: Web Information Needs (N =118)

Web Information Need	Gender				Total	
	Male		Female			
	Frequency (*f*)	Percentage (%)	Frequency (*f*)	Percentage (%)	*f*	%
Academic information	47	77	44	77	91	77
Personal development information	3	5	6	11	9	8
Leisure and entertainment	5	8	0	0	5	4
Just for knowledge on general issues	1	2	7	7	5	4
News and current affairs	4	7	2	2	5	4
Health information	1	2	4	4	3	3
Total	**61**	**100**	**57**	**100**		

that female students were hesitant to search the web for entertainment information, because it is addictive, thereby making them spend more time on some information, which they can get through social media groups. Results of the interview, further confirmed the results from the questionnaire that academic information is the major web information need of the students, followed by health information need. One of the respondents observed that:

> "When I am searching the Web, it is to find academic information and I usually also search information on health like nowadays most information about Covid-19 I get it from the Internet" (Participant C).

The findings attest to the fact that students have academic tasks to accomplish, hence they engaged in web information seeking to accomplish those tasks. It has been established from the findings that students have web information needs that predominantly relate to their studies and current affairs of the country and the world at large. According to Wilson's (1996) Model of Information Behaviour, the environment (context) determines their information needs (Wilson, 2016). Therefore, determining students' information needs within the context of their environment is an important step in addressing their information needs through the provision of relevant information sources. Therefore, MAU library personnel must understand the environment surrounding the students, as it is directly related to their information needs. The results are similar to the findings by Howlader and Islam (2019), Oluwaseye et al. (2017), Ncwane (2016), Chawinga and Zozie (2016) and Makondo et al. (2018) that undergraduate students' major web information needs, were assignments and examinations, health information, and job and career development information. Undergraduate students need web information to succeed in academic and social endeavours (Chawinga, 2016; Ifinedo, 2017).

Web Information Sources

The results presented in Table 3 show that the major web information sources of undergraduate students, were scholarly journals, Google Scholar and scholarly databases and minor information sources, were personal blogs spots or Webpages 3 (3%) and YouTube 2 (2%).

Table 3: Web Information Sources (N= 118)

Web information source	Frequency *(f)*	Percentage (%)
Scholarly Journals, Google Scholar, scholarly databases	51	43
Instructional sites like Dummies and How Stuff	29	25
Articles on online news sites like BBC, The Nation, Times 360	13	11
Google Books	9	8
Online Discussion forum	6	5
Wikipedia/online encyclopaedia	5	4
Personal Blog spots or Webpages	3	3
YouTube	2	2
Total	**118**	**100**

The results revealed that students used a variety of

web information sources to meet their web information needs with scholarly journals, Google Scholar, scholarly databases, instructional sites and articles on online news as the major sources. A chi-square test was computed to establish the significant difference between students' Web information needs and Web information sources. The chi-square test results are presented in Table 4. The results show that students' web information needs were statistically significant at a 1% significant level (N= 118, df = 35, X^2 = 101.470[a], p = .000). This implies that the web information needs of students were directly related to their information sources.
text academic documents with international standard

Table 4: Chi-square Test on Information Needs and Information Source

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	101.470[a]	35	.000
Likelihood Ratio	64.483	35	.002
Linear-by-Linear Association	1.719	1	.190
N of Valid Cases	118		

MAU undergraduate students' use of various scholarly academic web information sources could be attributed to user awareness campaigns facilitated by the library. According to Wilson's model, an individual can interact with different systems during the search for information such as online and other sources of informal information that include consulting colleagues on social networks, family members, teachers or a specialist in an area to exchange information (Wilson, 2016).

Students often mentioned the advantages of the web as being its ability to present a wide variety and diverse information. The findings are in agreement with those of a qualitative study by Okocha and Owolabi (2020) who focussed on the web information-seeking behaviour of undergraduate students in Kwara State Nigeria, which found that undergraduate students were using various scholarly journals and databases. Similar findings were also reported in a study done by Currie et al. (2010) at the University of Kansas in the USA, which established that the major web information sources of undergraduate students were eBooks, Google, Google Scholar, Yahoo, library databases and commercial academic databases.

The interview conducted with the students confirmed the findings obtained through the questionnaire. Students mostly mentioned scholarly journals as their main source of web information sources, because they were easier to use and cite as most of the time, they have complete bibliographic details compared to other sources. A chi-square test to establish the significant difference between students' web information needs and their web information sources, revealed that the web information sources were related to the web information needs of students at MAU. This entails that students mostly access academic information through scholarly journals to address their academic information needs.

According to the Stress and Coping Theory highlighted in Wilson's (1996) Model of Information Behaviour, information needs make individuals seek information from similar sources to minimise stress or failure and the greater the stress the greater the motivation to seek information from sources that will guarantee satisfying expectations. Academic assignments are demanding, and students would want to do well at all costs. As such, they search for information from scholarly databases, with a great reputation which influences the type of sources used. Wilson's (1996) Model of Information Behaviour also posits that the environment of an information seeker influences the information needs and the particular sources to address those needs.

The findings of the interview revealed that students preferred scholarly articles on Google Scholar, because they found it easier to use and cite the articles for academic purposes such as writing research project proposals. This was attributed to the fact that journal articles in academic databases have complete bibliographic details, and options to download full-

citation styles (APA, MLA, and Chicago), reference manager's options (Endnote, Refworks, Bibtex), and links to reputable publisher pages such as Sage, Elsevier, Emerald and Springer. Similar findings were reported in the studies by Kumar and Gopal (2020), El-Maamiry (2017), Lo and Chu (2015), Dasgupta et al. (2017), Obasola and Agunbiabe (2016), Okocha and Owolabi (2020), and Isibika and Kavishe (2018), which found that students accessed information sources such as electronic databases (Google Scholar, Scopus and Ebscohost), journal articles, digital libraries, open access repositories, Google, Yahoo, Wikipedia, Facebook, librarians and friends, for writing assignments, preparing for class discussions, and writing final-year research papers.

5.4 Web Information Searching Strategies

The results presented in Table 5, show that most of the students 51 (43%) used keywords and 35 (30%) students use full search terms. The least information searching strategy, was combining keywords with Boolean operators 4 (3%). These results show that the majority of students use simple search strategies. However, contrasting findings were reported in the

Table 5: Web Information Searching Strategies (N =118)

Web information searching strategy	Frequency *(f)*	Percentage (*%*)
Using Keywords to Search	51	43
Typing the full search terms in the search box	35	30
Typing in a phrase of the search	23	20
Using truncation Search	5	4
Combining Keywords with Boolean operators	4	3

The results from interviews confirmed the quantitative results that students preferred simple search techniques, because they gave them quick results and more information. The interviews further revealed that the library training mainly focused on simple search techniques and information resources available in the library. One respondent explained that:

> "Even though I do not know advanced search techniques, I type a full sentence in the search box because I want information that is exactly to the question or task I have" [Participant B]

The results imply that students practically follow only the easiest possible strategies for getting information to satisfy their needs. The reason for students' preference for simple search strategies could be attributed to a lack of training on advanced information search strategies during library orientations. Wilson's (1996) Model of Information Behaviour, segments information searching into passive attention, passive search, active search and ongoing search. It could therefore be concluded that undergraduate students at MAU follow both passive and active information-seeking behaviour. They can change the search strategies which, according to Wilson's (1996) Model of Information Behaviour, is regarded as active search. Students also change the information sources as they could consult classmates and lecturers and this behaviour is regarded as a passive search.

The findings are similar to those of a mixed methods study by Tlakula and Fombad (2017) in South Africa, which revealed that 90% of undergraduate students do not use advanced search strategies, which was attributed to a lack of information literacy training among the students. This phenomenon is supported by Ankrah and Atuase (2018), that robust online information literacy training is important for students to successfully search for information on the web. The importance of information literacy training was emphasised by Bushman et al. (2021) and Tlakula and Fombad (2017) that information literacy skills courses need to be embedded in the university curriculum based on the needs of students in the use of the web.

studies by Nadzir and Puteh (2017), Kadli and Hanchinal (2015) and Isibika and Kavishe (2018) in Malaysia, India and Tanzania respectively that undergraduate students used both basic search strategies and advanced or systematic search strategy in searching for web information. This could be attributed to continuous exposure to information literacy training among senior-level students compared to junior-level students who use simple search strategies due to a lack of training in information literacy (Isibika and Kavishe, 2018).

Barriers to Accessing and Using Information and their Solutions

The results presented in Table 6 revealed that the major barrier faced by students in accessing information was confusion, due to too much information on the web 53 (45%). The least barrier was a lack of information-searching skills 7(6%).

Interview findings from students established

Table 6. Barriers to Accessing and using information (n= 118)

Barriers to accessing and using information	Frequency (*f*)	Percentage (%)
Confusion due to too much information on the Web	53	45
Inadequate computers in the library and computer lab	21	18
Lack of time	17	14
Unfriendliness and unwillingness of library staff to assist	11	9
Lack of awareness of students of the existence of reliable and authentic +Web information on the Web	9	8
Lack of information-searching skills	7	6
Total	**118**	**100**

These results show that information overload was one of the barriers that respondents experienced in accessing information and using the information on the web. Results obtained from the interview confirmed the findings obtained through questionnaire. The following is a response from one of the students:

> "I don't know how to separate academic information from non-academic. There is just more information out there: [Participant G]

Information overload can be attributed to the fact that search engines such as Google rely on students, and search huge volumes of information at apparently impressive speed, but can retrieve duplicate, irrelevant and non-scholarly information as they often index information in the public domain.

According to Wilson's (1996) Model of Information Behaviour, the problem of information overload among students could arise from the inability to evaluate information, due to cognitive and personal issues (psychological and emotional issues), which impact their competence in the search and use of information. The findings corroborate the findings of a qualitative study by Makondo et al. (2018) that found that undergraduates are easily confused with the abundant information online or on the web.

Insufficient facilities, especially computers, in the library and computer laboratories, were cited as a barrier to students' web information seeking. Registered students at MAU Lake View Campus access the web mainly, through university facilities, such as the library and computer laboratories, which are inadequate, with slow Internet speeds. The expanding student population is straining the available resources and the effective use of the web is not achieved, because its use presupposes the existence and access to appropriate ICT infrastructure. Similar findings were reported in studies by Thindwa et al. (2019) and Chipeta et al. (2018), that most undergraduate students faced the challenge of a good ICT infrastructure.

that unfriendliness and unwillingness of intermediaries in the library, and computer laboratories, especially library assistants, were cited as barriers to students' accessing and using the information on the Web. One respondent stated:

> "If library assistants were friendly and willing to assist students in Web information searching, many students would approach them" [Participant C].

The unfriendliness and unwillingness of library assistants at times could mean that they have created barriers in responding to patrons' queries in emerging and advanced trends in web information seeking due to knowledge gaps in web services and professionalism. Most library assistants at MAU Lake View Campus are holders of certificates in library and information science, and as such still have knowledge gaps in information services and professionalism. In line with Wilson's (1996) Model of Information Behaviour, role-related or interpersonal problems originate from interpersonal relationships between students and the library staff during the information-seeking process. Unlike machines, human beings are usually unpredictable and inconsistent in their attitude and behaviour resulting in conflicts and inconsistencies in the delivery of services to clients (Wilson, 2016). Thus, to deliver the best service, human aspects such as interpersonal relationships, should be addressed to improve access to and use of information among undergraduate students. The results are similar to those of Thindwa et al. (2019), Chipeta et al. (2018), Ncwane (2016), and Okocha and Owolabi (2020), which revealed several barriers faced by students in accessing and using web information, such as information overload, inadequate computers in the library, power outages, lack of information seeking skills, lack of awareness, user unfriendliness of laboratory or library assistants and insufficiency of web amenities. The barriers of lack of information seeking skills and lack of awareness of web information could be attributed to a lack of exposure to ICTs early in life as most students in Africa own a computer at the university level (Isibika and Kavishe, 2018).

Some students were not aware of subject-specific databases, such as Scopus, where they could get scholarly and reliable information with all bibliographic details available, and even reference citations provided. In line with Wilson's (1996) Model of Information Behaviour, a lack of awareness of reliable and authentic web information could be classified as a personal barrier as it is related to the student's inability to deal with language issues, mainly English, and its technicalities, which is the dominant language in most scientific articles and international academic databases. In addition, the barrier could also be worsened by insufficient marketing and awareness campaigns by the MAU library.

Conclusion and Recommendations

The study has demonstrated that web information is critical among undergraduate students at MAU for academic, personal, and health purposes. The library at MAU should support undergraduate students with access to web information resources through subscriptions to e-resources. It is also important that the library offers training sessions to students in information literacy for effective access and use of the information resources. The skills acquired through information literacy training, can assist the students in using advanced information search strategies to acquire the relevant information sources and effectively use them in their academic, personal and health needs.

It is recommended that the library management at MAU should conduct tailor-made information literacy training sessions, targeting students to raise awareness of the existence of web information sources. Students would be able to judge the quality of information on the web and they would eventually overcome information overload, and improve access to the web and use information ethically. Similarly, MAU, Lake View Campus' top management needs to encourage students to use mobile phones and tablets to access web information sources. This will greatly reduce over-dependence on the few computers available in the library and computer laboratories. Lastly, MAU Lake View Campus's top management and leadership should consider sources for funds to acquire additional computers and pay for increased Internet bandwidth to enhance access and use of web information by students.

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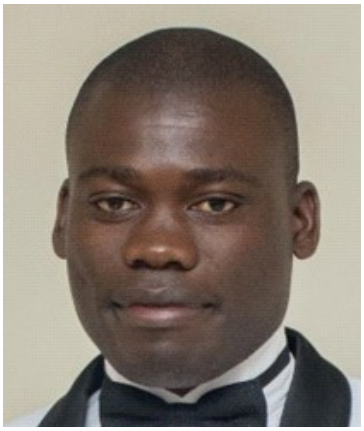

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COVID-19 Vaccine Misinformation, Disinformation and Vaccine Hesitancy among Library and Information Science Professionals in Nigeria

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Abstract

This study investigated the extent of COVID-19 vaccine misinformation, disinformation, and their effects on COVID-19 vaccine hesitancy among library and information science (LIS) professionals in Nigeria. The study adopted a quantitative method that deployed a questionnaire-based survey research design. Two=hundred and twenty-two (222) LIS professionals in Nigeria participated in the survey. Constructed based, on the variables synthesised from various studies, the questionnaire was self-designed on Google web form and was posted on online platforms to collect data from the participants. Data were analysed using descriptive and inferential statistics (structural equation modelling) with tables and charts adopted in the presentation of the results. Findings revealed that the extent of COVID-19 vaccine misinformation and disinformation among LIS professionals in, Nigeria was at a low level. Moreover, the extent of COVID-19 vaccine hesitancy among LIS professionals in Nigeria was at a low level. Even at that low level, a striking finding was that COVID-19 vaccine misinformation had more positive effect (β = 0.357, p =0.001) on COVID-19 vaccine hesitancy than COVID-19 vaccine disinformation had (β = 0.235, p =0.027). Moreover, COVID-19 vaccine misinformation and disinformation had jointly significantly predicted COVID-19 vaccine hesitancy. Efforts should be geared towards curbing disinformation and misinformation because they pose a grave danger to public health now and in the future.

Keywords: COVID-19, Misinformation, Disinformation, Vaccine Hesitancy, Library and Information Science Professionals, Nigeria.

Introduction

Misinformation and disinformation regarding coronavirus disease 2019 (COVID-19) pose a significant threat to public health as they have the potential to exacerbate public health issues by encouraging disease spread. In order to avert this, effective communication is essential to ensure that people understand how to protect themselves and others from the virus. However, the World Health

Organisation (WHO) and its partners have been working tirelessly to filter through the noise on social media in order to give reliable COVID-19 guidance (Ennab et al., 2022). Literature has shown that the global spread of the novel coronavirus is affected by the spread of related misinformation – the so-called COVID-19 Infodemic that makes populations more vulnerable to the disease through resistance to mitigation efforts. Researchers reported that misinformation "super spreaders" are often associated with the low-credibility sources (Yang et al., 2021).

According to World Health Organisation (2021), disinformation is defined as "false information created with the intention of profiting from it or causing harm. Therefore, it becomes imperative that all stakeholders involved in the COVID-19 vaccination programme realise the negative effect of infodemic and disinformation on these efforts and actively take steps to counter them. However, vaccination is one of the most cost-effective ways of avoiding disease. High rates of successful vaccinations can help us overcome this global health challenge of COVID-19 pandemic but this is threatened by infodemic misinformation and disinformation (Farooq and Rathore, 2021). According to Ayanbode and Adetoro (2021), an infodemic is a glut of information, some accurate and some inaccurate, thus making it burdensome for people to find credible sources and reliable advice when needed.Moreover, COVID-19 vaccine disinformation is still an ongoing threat to the society (Prabagar et al., 2022).

Several studies have been carried out on the COVID-19 pandemic, COVID-19 vaccination and other associated infodemic. For instance, Hadlington et al. (2022) carried out a study on perceptions of fake news, misinformation, and disinformation amid the COVID-19 pandemic. Findings showed that fake news and misinformation spread quickly and virulently during the height of COVID-19 pandemic, potentially outpacing the spread of the virus itself across the globe. Similarly, Shahi, Dirkson and Majchrzak (2021) showed additional evidence that misinformation is often circulated with a view to distract people from authentic information. In other words, false information tends to propagate faster than semi authentic information, while brands or celebrity accounts often act as a super-spreader of misinformation, exposing more people to false information with their network. However, many of these studies were not in the context of Nigeria and the need to evident COVID-19 vaccine acceptance among the library and information science (LIS) professionals- the gatekeepers in information and knowledge management is crucial to curbing the associated misinformation and disinformation in the society. Hence, this study investigated the extent of COVID-19 misinformation, disinformation and their effects on COVID-19 vaccine hesitancy among LIS professionals in Nigeria.

Specifically the following research questions guided the study:

Research questions

1. What is the extent of COVID-19 Vaccine Misinformation among LIS professionals in Nigeria?
2. What is the extent of COVID-19 Vaccine Disinformation among LIS professionals in Nigeria?
3. What is the extent of COVID-19 Vaccine hesitancy among LIS professionals in Nigeria?
4. Are there relationships among COVID-19 Vaccine Misinformation, COVID-19 Vaccine Disinformation and COVID-19 Vaccine hesitancy?
5. When did you take the COVID-19 vaccine?

Conceptualisation and Hypotheses

Research Model

Figure 1 was developed by the authors to illustrate the assumed nexus among the three variables in this current study. In Figure 1, COVID-19 Vaccine hesitancy is a dependent variable, while COVID-19 Vaccine Misinformation and COVID-19 Vaccine Disinformation are independent variables. While COVID-19 Vaccine Misinformation and COVID-19 Vaccine Disinformation are expected to be significantly related, both are also assumed to significantly predict COVID-19 Vaccine hesitancy.

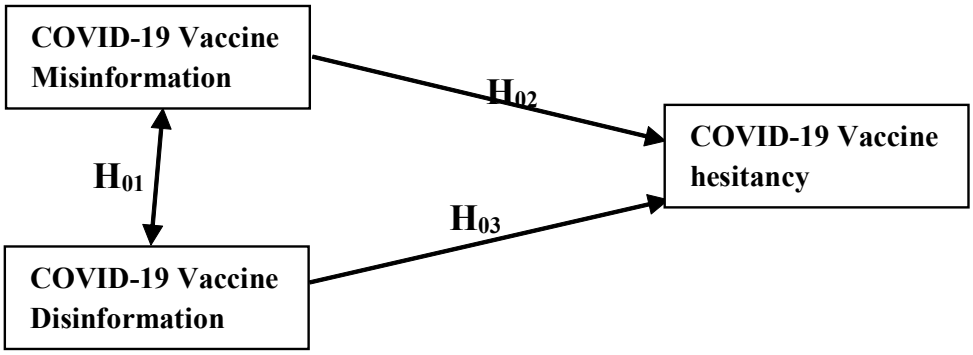

Figure 1. Hypothesised Model of COVID-19 Vaccine Misinformation, COVID-19 Vaccine Disinformation and COVID-19 Vaccine hesitancy

COVID-19 Vaccine Misinformation and Disinformation

COVID-19 vaccine misinformation is "false information about COVID-19 vaccine created with the intention of selfish gain or causing harm (WHO, 2021). Several studies have been conducted on the spread of COVID-19 vaccine misinformation and disinformation and their effects on vaccination intent. The study done by Loomba et al. (2021) on measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA, in order to inform successful vaccination campaigns, to quantify how exposure to online misinformation around COVID-19 vaccines affects intent to vaccinate to protect oneself or others. The findings revealed that in both countries recent misinformation induced a decline in vaccination intent.

A retrospective cohort study done by Lurie et al. (2022) reviewed that 41 718 (3.2% of all COVID-19 vaccine articles) contained at least one of the vaccine misinformation themes based on the Boolean string developed for the study. The study concluded that COVID-19 vaccine misinformation in traditional news media is uncommon but has the capacity to reach large numbers of readers and affect the vaccine conversation. However, recent increases in fact-checking may counteract some of the misinformation currently circulating. Elsewhere, similar finding has been reported, a retrospective observational infodemic study done by Calac et al. (2022) on the spread of COVID-19 Vaccine misinformation in the Ninth Inning established that a total of 436 tweets were initially sampled from the Twitter Search Application Programming Interface. Misinformation was the most prominent content type (n=244, 56%) detected, followed by public reaction (n=122, 28%) and media reporting (n=69, 16%).

Recent study by Skafle (2022) examined the misinformation about COVID-19 vaccines on social media: rapid review. The search yielded 757 records, with 45 articles selected for this review. They identified three main themes of misinformation: medical misinformation, vaccine development, and conspiracies. A vast majority of studies were from industrialised western countries. Additionally, a recent study has supported the implementation of integrated preventive procedures; internationalisation of infodemic management and related information technologies to prevent, disrupt, and detect misinformation and disinformation efficiently (Gradoñ et al., 2021).

Farooq and Rathore (2021) expressed that COVID-19 related infodemic and disinformation is a threat to the successful COVID-19 vaccination campaign. Hence, Gisondi et al. (2022) recommended that the social media companies should redesign social media algorithms to reduce the spread of COVID-19 misinformation, identify and remove harmful bots from platforms, censor sources of COVID-19 misinformation and disinformation. The review of previous studies may indicate a possible relationship between COVID-19 vaccine misinformation and disinformation. Notwithstanding, it was proposed that:

H_{01}: There is no significant relationship between COVID-19 Vaccine Misinformation and COVID-19 Vaccine Disinformation

COVID-19 Vaccine Hesitancy

According to the WHO (2019), vaccine hesitancy is "the delay in acceptance, reluctance, or refusal of vaccination despite the availability of vaccination services." Vaccination is a key global strategy to mitigate the clinical impact of the COVID-19 virus. As part of local efforts to manage the outbreak, the government of Ghana announced its intention to vaccinate its population starting with essential and high-risk workers including radiographers. However, there were reports of hesitance to receiving the vaccine among the radiography workforce. This study was undertaken prior to the intended vaccination exercise to assess the willingness and concerns of radiographers to undergo the COVID-19 vaccination. In this study, there were 108 responses (response rate of 46.3%). The majority (n = 64, 59.3%) were willing to have the vaccine, however, some (n = 44, 40.7%) were not. The main reason behind their willingness to have the vaccine was its ability to reduce the spread of infections and lower mortality (n = 35, 54.7%). However, doubts about the vaccine's efficacy and side effects (n = 26, 56.8%), conspiracy theory concerns about its effects on the Ghanaian race (n = 4, 9.1%), and fertility concerns (n = 2, 4.5%) were some reasons for their hesitance to receive the vaccine. The open text commentary further revealed that the vaccine was thought of as a lifesaving medication, however, clinical safety concerns, lack of education/information and religious beliefs were affecting peoples' willingness to be vaccinated. The study further showed that a large proportion of the Ghanaian radiography workforce were willing to receive the vaccine, however, a significant number were not. The observed results call for an urgent public health educational intervention from stakeholders to promptly address the COVID-19 vaccine hesitancy (Botwe et al., 2022).

Ennab et al. (2022) reported that 'infodemic' has led to rising vaccine hesitancy which is of paramount concern with the WHO even identifying it as one of the ten main threats to global health almost two years before the approval of COVID-19 vaccines. Certainly it is no exaggeration to say that lives are at stake: trustworthy information that carries the day over rumours, misinformation and dangerous speculation is critically important to confront global and local health emergencies (Alonso-Galbán and Alemañy-Castilla, 2022). It has been observed that rumours can swiftly spread online and can lead to the disruption of vaccine campaigns. In Kenya, for example, false statements regarding COVID-19 vaccines disrupting the menstrual cycle began to circulate online in May 2021(Ennab, 2022).

Gisondi, et al. (2022) confirmed that COVID-19 is currently the third leading cause of death in the United States, and unvaccinated people continue to die in high numbers. They further stated that vaccine hesitancy and vaccine refusal are fuelled by COVID-19 misinformation and disinformation on social media platforms. In the study done by Calac (2022), it was found that the death of a high-profile ethnic minority celebrity led to the spread of misinformation on Twitter. This misinformation directly challenged the safety and effectiveness of COVID-19 vaccines at a time when ensuring vaccine coverage among minority populations was paramount.

A cross-sectional study on attitudes toward receiving COVID-19 booster dose in the Middle East and North Africa (MENA) Region by Abouzid et al. (2022) said that the main reasons to refuse the booster dose were uncertainties over their safety, belief that the booster dose is unnecessary, and side effects associated with previous COVID-19 vaccine doses. A rapid review study done by Skafle (2022) identified 19 studies in which the effect of social media misinformation on vaccine hesitancy was measured or discussed. The results established that the misinformation spread on social media had a negative effect on vaccine hesitancy and uptake. They concluded that to prevent these misconceptions from taking hold, health authorities should openly address and discuss these false claims with both cultural and religious awareness in mind.

In Nigeria, a cross-sectional study was conducted by Adedeji-Adenola, Olugbake, and Adeosun (2022). The majority of the respondents were willing to get the vaccine (856; 80.9%). Those without a prior diagnosis of COVID-19 had a lower willingness to get vaccinated. The study revealed a high level of awareness, willingness to receive the vaccine and moderate perception towards the

vaccination activities. Furthermore Lucia, Kelekar and Afonso (2021) studied COVID-19 vaccine hesitancy among medical students. Finding from the study showed that nearly all participants had positive attitudes towards vaccines and agreed they would likely be exposed to COVID-19; however, only 53% indicated they would participate in a COVID-19 vaccine trial and 23% were unwilling to take a COVID-19 vaccine immediately upon FDA approval. However, misinformation and disinformation regarding COVID-19 and vaccination against it may be contributing to vaccine hesitancy (Basch et al., 2021).

In a study carried out by Troiano and Nardi (2021) on the vaccine hesitancy in the era of COVID-19, the study confirmed that several factors influenced the acceptance or refusal (ethnicity, working status, religiosity, politics, gender, age, education, income, etc.). The most given reasons to refuse vaccine were as follows: being against vaccines in general, concerns about safety/thinking that a vaccine produced in a rush is too dangerous, considering the vaccine useless because of the harmless nature of COVID-19, general lack of trust, doubts about the efficiency of the vaccine, belief to be already immunised, doubt about the provenience of vaccine. The study concluded that the high vaccine hesitancy, also during

COVID-19 pandemic, represents an important problem, and further efforts should be done to support people and give them correct information about vaccines. It is also in partial agreement with the findings of Adedeji-Adenola, Olugbake, and Adeosun (2022), whose study reviewed that some influencing factors that significantly affects awareness: religion, occupation, education and prior diagnosis of COVID-19; for perception and willingness—occupation, and prior diagnosis of the COVID-19 were influencing factors. In the same light Soares et al. (2021) specifically carried out a study on factors associated with COVID-19 vaccine hesitancy. They used multinomial regression to identify factors associated with intention to delay or refuse to take COVID-19 vaccines. The study reviewed that COVID-19 vaccine hesitancy in Portugal was high: 56% would wait and 9% refuse. The study identified several factors were associated with both refusal and delay: being younger, loss of income during the pandemic, no intention of taking the flu vaccine, low confidence in the COVID-19 vaccine and the health service response during the pandemic, worse perception of government measures, perception of the information provided as inconsistent and contradictory, and answering the questionnaire before the release of information regarding the safety and efficacy of COVID-19 vaccines.

Sallam (2021) reported that vaccine hesitancy can be the major hindrance of the control efforts to lessen the negative consequences of COVID-19 pandemic, at least in certain countries/regions. Further reviewed that the widespread prevalence of COVID-19 vaccine hesitancy mandates collaborative efforts of governments, health policy makers, and media sources, including social media companies. It is recommended to build COVID-19 vaccination trust among the general public, via the spread of timely and clear messages through trusted channels advocating the safety and efficacy of currently available COVID-19 vaccines.

Rutten et al. (2021) affirmed that vaccine hesitancy threatens to compromise the success of COVID-19 vaccination programmes. Evidences from several studies reviewed that several factors such as misinformation and disinformation among others influenced the acceptance or refusal of COVID-19 vaccines. The literature further showed that a large proportion of the people were willing to receive the vaccine, however, a significant number were not. Nevertheless, it was proposed that:

H_{02}: COVID-19 Vaccine Misinformation does not have positive effect on COVID-19 Vaccine hesitancy.

H_{03}: COVID-19 Vaccine Disinformation does not have positive effect on COVID-19 Vaccine hesitancy.

Research Methodology

Research Design, Population, and Sampling

The study adopted a survey design approach (quantitative) in order to enable the generalisation of the result to the entire population of the study. All LIS professionals in Nigeria were purposively selected. This study targeted LIS professionals in Nigeria because many of the studies done were not in the context of Nigeria and there is a need to

establish the level of COVID-19 vaccine acceptance among the LIS professionals who are regarded as the gatekeepers in information and knowledge management. The population of study was all 7298 LIS professionals spread across libraries, tertiary institutions, schools, government offices and agencies, private organisations, and broadcast institutions. Though Krejcie and Morgan (1970) recommend a sample size of 383 for such population, 222 LIS professionals responded to the questionnaire, representing a response rate of 58%.

Data Collection Instrument and Procedure

Data were collected between July, 2022 and March, 2023. Constructed based on the variables synthesised from various studies, the questionnaire was self-designed on Google web form and was administered online. The participants were invited to complete the online survey through WhatsApp platforms of LIS professionals such as NLA groups, MLA NG group, NALISE among others. In addition, colleagues were involved in distributing the questionnaire link directly to fellow professional colleagues. The questionnaire comprised four sections as follows: Section A focused on demographic characteristics of the respondents: institution, gender, age, highest educational qualification and year of professional experience. Section B elicited data on COVID-19 Vaccine Misinformation. It contained nine items synthesised from Alonso-Galbán and Alemañy-Castilla 2022, Basch et al. 2021 and Ennab et al. 2022. Section C collected data on COVID-19 Vaccine Disinformation. It contained ten items synthesised from Alonso-Galbán and Alemañy-Castilla 2022, Basch, et al. 2021, Farooq and Rathore 2021, and Section D collected data about the COVID-19 vaccine hesitancy. It contained ten items synthesised from Botwe et al. 2022, Ennab et al. 2022, Farooq and Rathore 2021. Section E elicited data on when respondents took the COVID-19 vaccine. Except for Sections A and E, the rest sections B, and C were measured on a 5-point Likert scale: To a Very Great Extent =5, To a Great Extent =4, To a Moderate Extent =3, To Low Extent =2, To No Extent =1, while section D was measured on Very true of me =5, True of me =4, I don't know=3, Not true of me=2, Never true of me =1. Content validity of the questionnaire was done through a review by two experts in the field. To determine the reliability of the questionnaire, it was pre-tested on 10 teachers from Egba Comprehensive High School, Asero, Abeokuta.

Reliability Analysis

The overall Cronbach alpha value for the whole scale was 0.96, which was above the 0.70 recommended by Nunnally (1978). Thus, indicating that the scales were good and acceptable for use in the main study.

Ethical Consideration

In the conduct of this study, the researchers ensured that ethical issues were strictly adhered to. The study was devoid of plagiarism as sources of materials were duly acknowledged and cited appropriately. Informed consent was sought by making sure that the consent form contained a comprehensive description of the research. Confidentiality was guaranteed as responses were anonymised and solely used for the research. Ethics relating to respect for persons and beneficence was ensured. In respect for persons, respondents were empowered to decide on whether or not to participate in the study and to withdraw their participation at any stage. With respect to beneficence, this study did not harm and posed no potential risk to the respondents.

Data Analysis

Collected data were analysed using descriptive (frequency counts, percentages, mean, and standard deviation) and inferential statistics (structural equation modelling) with tables, figures and charts used in the presentation of the results.

The Respondents

As shown in Table 1, exactly 110 (49.5%) of the respondents were males, while 112 (50.5%) were females. Most of the respondents, 77 (34.7%) were in the age group of 40-49 years, while 66 (29.7%) of them were in the age group of 50 years and above. The mean age of the respondents is 37.48 years (Std Deviation = 1.018). More than one third 82 (36.9%) of the respondents had master's degree, while just 54 (24.3%) had PhD. More than half of the respondents 135 (60.8%) had over 10 years of professional experience.

Table 1. Demographic characteristics of the respondents

		Frequency	*Percent*
Gender	Male	110	49.5
	Female	112	50.5
	Total	**222**	**100**
Age range	20-29	10	4.5
	30-39	69	31.1
	40-49	77	34.7
	50-59	48	21.6
	59 and Above	18	8.1
	Total	**222**	**100**
Highest Educational Qualification	Higher National Diploma	5	2.3
	Bachelor	77	34.7
	Masters	82	36.9
	PhD	54	24.3
	Other	4	1.8
	Total	**222**	**100.0**
Years of Professional Experience	0-5	36	16.2
	6-10	51	23.0
	11-15	46	20.7
	16-20	38	17.1
	21-25	24	10.8
	26-30	12	5.4
	31-35	7	3.2
	>35	8	3.6
	Total	**222**	**100.0**

Results

Descriptive Analysis

In this section, the results are presented in line with the research questions starting with research question one.

Research question 1: What is the extent of COVID-19 Vaccine Misinformation among LIS professionals in Nigeria?

Table 2. Extent of COVID-19 Vaccine Misinformation among LIS Professionals

COVID-19 Vaccine Misinformation	5	4	3	2	1	Mean	Std. Dev
Africans are the least affected, there is no need to rush to take the COVID-19 vaccines	25 (11.3)	31 (14.0)	59 (26.6)	59 (26.6)	48 (21.6)	2.67	1.272
There are ulterior motives behind the COVID-19 vaccination	29 (13.1)	26 (11.7)	43(19.4)	46 (20.7)	78 (35.1)	2.47	1.272
I feel the government has selfish intentions in the fight against COVID-19 with the vaccination exercise.	40 (18.0)	34 (15.3)	38 (17.1)	41 (18.5)	69 (31.1)	2.71	1.272
COVID-19 vaccines are not safe	21 (9.5)	19 (8.6)	40 (18.0)	51 (23.0)	91 (41.0)	2.23	1.272
COVID-19 vaccines are not well tested	32 (14.4)	29 (13.1)	51 (23.0)	43 (19.4)	67 (30.2)	2.62	1.272
COVID-19 was manufactured in the lab in order to sell COVID-19 vaccines	22 (9.9)	21 (9.5)	39 (17.6)	55 (24.8)	85 (38.3)	2.28	1.272
COVID-19 vaccines are dangerous. They are not like other vaccines	23 (10.4)	21 (9.5)	26 (11.7)	53 (23.9)	99 (44.6)	2.17	1.272
COVID-19 vaccines affect fertility.	12 (5.4)	6 (2.7)	24 (10.8)	32 (14.4)	148 (66.7)	1.66	1.272
COVID-19 vaccines cause still birth	10 (4.5)	8 (3.6)	15 (6.8)	37 (16.7)	152 (68.5)	1.59	1.272
Weighted mean = 2.27							

Note: Percentage in parenthesis

Key: To a Very Great Extent =**5**, To a Great Extent =**4**, To a Moderate Extent =**3**, To Low Extent =**2**, To No Extent =**1**

Cut off = 3.0

Results in Table 2 show the extent of COVID-19 vaccine misinformation among LIS professionals in Nigeria; the weighted mean was $\bar{x}$ 2.27 on a five-point scale with a threshold of $\bar{x}$=3.00. This suggests that the extent of COVID-19 vaccine misinformation among LIS professionals in Nigeria was at a low level. Nevertheless, at above low level, 112 (50.4%) of the respondents felt that the government had selfish intentions in the fight against COVID-19 with the vaccination exercise ($\bar{x}$=2.71), 115 (51.9%) indicated that Africans are the least affected, there is no need to rush to take the COVID-19 vaccines ($\bar{x}$= 2.67), and 112 (50.5%) of the respondents indicated that COVID-19 vaccines are not well tested ($\bar{x}$= 2.62). The findings suggest that probably, many of the LIS professionals had adequate information literacy skills.

Research question 2: What is the extent of COVID-19 Vaccine Disinformation among LIS professionals in Nigeria?

Table 3. Extent of COVID-19 Vaccine Disinformation among LIS Professionals

COVID-19 Vaccine Disinformation	**5**	**4**	**3**	**2**	**1**	**Mean**	**Std. Dev**
Be warned, COVID-19 vaccines are biological weapons.	15 (6.8)	17 (7.7)	27 (12.2)	41 (18.5)	122 (55.0)	1.93	1.260
COVID-19 vaccines are developed to reduce African population, don't take any of them	22 (9.9)	(8.1)	16 (7.2)	37 (16.7)	129 (58.1)	1.95	1.369
COVID-19 vaccines are meant to alter genetic makeup of people, avoid them	17 (7.7)	16 (7.2)	19 (8.6)	43 (19.4)	127 (57.2)	1.89	1.277
COVID-19 vaccines will only make the western world richer. So, it not necessary to take any of them.	20 (9.0)	25(11.3)	27 (12.2)	40 (18.0)	110 (49.5)	2.12	1.368
COVID-19 vaccines are ordinary mixture of multivitamins. Please, go natural.	11 (5.0)	19 (8.6)	28 (12.6)	41 (18.5)	123 (55.4)	1.89	1.210
Be warned, COVID-19 vaccines trigger hypertension	12 (5.4)	12 (5.4)	28 (12.6)	29 (13.1)	141 (63.5)	1.76	1.189
COVID-19 vaccines trigger heart attack. Please, avoid them	12 (5.4)	13 (5.9)	21 (9.5)	42 (18.9)	134 (60.4)	1.77	1.171
Many people died as a result of taking COVID-19 vaccine than of the disease itself.	11 (5.0)	(9.0)	20 (9.0)	43 (19.4)	128 (57.7)	1.84	1.206
One is likely to develop some severe side effects from COVID-19 vaccines. Please, take caution	33 (14.9)	28(12.6)	34 (15.3)	49 (22.1)	78 (35.1)	2.50	1.451
No enough research evidence to back the potency of the vaccines. Avoid them.	34 (15.3)	27(12.2)	40 (18.0)	58 (26.1)	63 (28.4)	2.60	1.407
Weighted mean = 2.03							

Note: Percentage in parenthesis

Key: To a Very Great Extent =**5**, To a Great Extent =**4**, To a Moderate Extent =**3**, To Low Extent =**2**, To No Extent =**1**

Cut off =3.0

Results in Table 3 show the extent of COVID-19 vaccine disinformation among LIS professionals in Nigeria; the weighted mean was $\bar{x}$ = 2.03 on a five-point scale with a threshold of $\bar{x}$=3.00. This suggests that the extent of COVID-19 vaccine disinformation among LIS professionals in Nigeria was at a low level, generally. Notwithstanding, at above low level, just 101 (45.5%) of the respondents believed that there is not enough research evidence to back the potency of the vaccines. So, they should be avoided ($\bar{x}$=2.60), 95 (42.8%) indicated that one is likely to develop some severe side effects from COVID-19 vaccines ($\bar{x}$= 2.50). The findings suggest that many of the LIS professionals were not victims of COVID-19 vaccine disinformation.

Research question 3: What is the level of COVID-19 Vaccine hesitancy among LIS professionals in

Table 4. Level of COVID-19 Vaccine hesitancy among LIS professionals in Nigeria

COVID-19 Vaccine hesitancy	5	4	3	2	1	Mean	Std. Dev
Till now I am sceptical about taking the COVID-19 vaccine	40 (18.0)	34 (15.3)	23 (10.4)	39 (17.6)	86 (38.7)	2.56	1.555
It took me time to decide on taking COVID-19 vaccine but I eventually took it	53 (23.9)	46 (20.7)	18 (8.1)	38 (17.1)	67 (30.2)	2.91	1.595
I delayed taking the vaccine because I was sceptical about its effectiveness and side effects	89 (40.1)	39 (17.6)	25 (11.3)	21 (9.5)	48 (21.6)	3.45	1.596
I am not willing to take the vaccine because of I heard it affects people with underlying health conditions	60 (27.0)	20 (9.0)	22 (9.9)	34 (15.3)	86 (38.7)	2.70	1.673
I hold back from taking the vaccine because I am not sure I will tolerate it	58 (26.1)	25 (11.3)	26 (11.7)	37 (16.7)	76 (34.2)	2.78	1.631
Some pieces of information I have about the vaccine do not inspire me to take it.	61 (27.5)	38 (17.1)	23 (10.4)	33 (14.9)	67 (30.2)	2.97	1.624
I refused to take the vaccine because I was not sure of its effectiveness and side effects.	55 (24.8)	24 (10.8)	17 (7.7)	35 (15.8)	91 (41.0)	2.63	1.664
I am not just interested in taking the vaccine	47 (21.2)	20 (9.0)	27 (12.2)	28 (12.6)	100 (45.0)	2.49	1.616
I don't need the vaccine	51 (23.0)	13 (5.9)	22 (9.9)	27 (12.2)	109 (49.1)	2.41	1.653
I will do everything to dodge taking the vaccine	44 (19.8)	11 (5.0)	26 (11.7)	29 (13.1)	112 (50.5)	2.31	1.588
Weighted Mean = 2.47							

Note: Percentage in parenthesis

Key: Very true of me =**5**, True of me =**4**, I don't know=**3**, Not true of me=**2**, Never true of me =**1**

Cut off =3.0

Nigeria?

Results in Table 4 show the extent of COVID-19 Vaccine hesitancy among LIS professionals in Nigeria; the weighted mean was $\bar{x}$ 2.47 on a five-point scale with a threshold of $\bar{x}$=3.00. This suggests that the extent of COVID-19 Vaccine hesitancy among LIS professionals in Nigeria was at a low level, generally. For example, 63.6% of the participants responded negatively to the statement 'I will do everything to dodge taking the vaccine' ($\bar{x}$=2.31). Also, 141 (61.3%) attached great importance to vaccination by responding negatively to the statement 'I don't need the vaccine' ($\bar{x}$=2.41). Notwithstanding, at above low level, more than half (n =128, 57.7%) of the respondents indicated that they delayed taking the vaccine because they were sceptical about its effectiveness and side effects ($\bar{x}$ =3.45), and less than half (n =99, 44.6%) of the respondents indicated that some pieces of information they had about the vaccine did not inspire them to take it ($\bar{x}$ = 2.97). The findings suggest that the majority of the LIS professionals were well informed to make positive and appropriate decision to take COVID-19 vaccine.

Research question 4: When did you take the

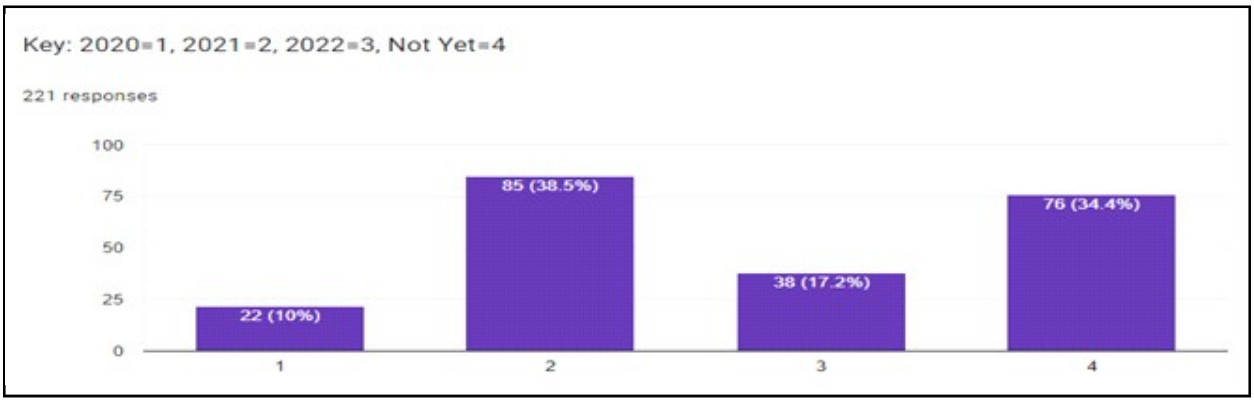

Figure 2. When Respondents took the COVID-19 vaccine

Results in Figure 2 show how many of the respondents took the vaccine and when. More than half, 145 (65.3%) of the respondents indicated that they had taken one brand of the COVID-19 vaccine or another. Of the 145 respondents, only 10% of them took the vaccine in 2020. This suggests an initial very low positive response to vaccination. Over one third 34.4% of them were yet to take the vaccine. This further corroborates that COVID-19 Vaccine hesitancy existed among LIS professionals in Nigeria though at a low level.

Inferential Analysis

In this analysis, Structural Equation modelling (SEM) was employed. The measurement model was first assessed using Confirmatory Factor Analysis (CFA) and thereafter the structural model was assessed. This is because the study deployed hypotheses testing to establish causal effects. The SEM were conducted using AMOS version 23.

Data Reduction Using Principal Component Analysis

Kaiser-Meyer-Olkin measure of sampling adequacy test accounted for 89.6%, which was higher than the 60% threshold recommended by Hair et al. (2010). Bartlett's test was significant x^2= 1945.970, df = 78, p= 0.000, indicating that the items were appropriate factors.

Loadings

Table 5 shows that seventeen items loaded on three factors (constructs). All the items loadings were >0.50 ranging from 0.71 to 0.90. Hence, all the three constructs have satisfactory convergent validity. Items of same constructs loaded highly on their constructs in comparison to their loadings on other different constructs. This confirms the discriminant validity. The extracted factors accounted for 73.8% of the total variance and their eigenvalues ranged from 1.157 to 6.589.

Table 5. Rotated Component Matrix

Codes	Items	Component		
		1	2	3
MIS7	There are ulterior motives behind the COVID-19 vaccination	**0.740**	0.122	0.293
MIS8	I feel the government has selfish intentions in the fight against COVID-19 with the vaccination exercise.	**0.741**	0.223	0.186
MIS9	COVID-19 vaccines are not safe	**0.713**	0.286	0.261
MIS10	COVID-19 vaccines are not well tested	**0.766**	0.204	0.182
MIS11	COVID-19 was manufactured in the lab in order to sell COVID-19 vaccines	**0.733**	0.087	0.328
VH25	Till now I am sceptical about taking the COVID-19 vaccine	0.176	**0.799**	0.232
VH30	Some pieces of information I have about the vaccine do not inspire me to take it.	0.277	**0.786**	0.209
VH31	I refused to take the vaccine because I was not sure of its effectiveness and side effects.	0.162	**0.901**	0.137
VH32	I am not just interested in taking the vaccine	0.152	**0.863**	0.130
DIS15	Be warned, COVID-19 vaccines are biological weapons.	0.326	0.141	**0.815**
DIS16	COVID-19 vaccines are developed to reduce African population, don't take any of them	0.343	0.243	**0.817**
DIS17	COVID-19 vaccines are meant to alter genetic makeup of people, avoid them	0.385	0.194	**0.784**
DIS22	Many people died as a result of taking COVID-19 vaccine than of the disease itself.	0.168	0.215	**0.854**

Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization.

Key: MIS= misinformation, DIS = disinformation, VH = vaccine hesitancy

COVID-19 vaccine?

Confirmatory Factor Analysis: Measurement Model Assessment

Figure 3 presents the result of Pooled CFA. The model consists of three First-Order Constructs, which are: (i) COVID-19 Vaccine Misinformation, (ii) COVID-19 Vaccine Disinformation, and (iii) COVID-19 Vaccine Hesitancy. The figure reveals the correlation among COVID-19 Vaccine Misinformation, COVID-19 Vaccine Disinformation, and COVID-19 Vaccine Hesitancy.

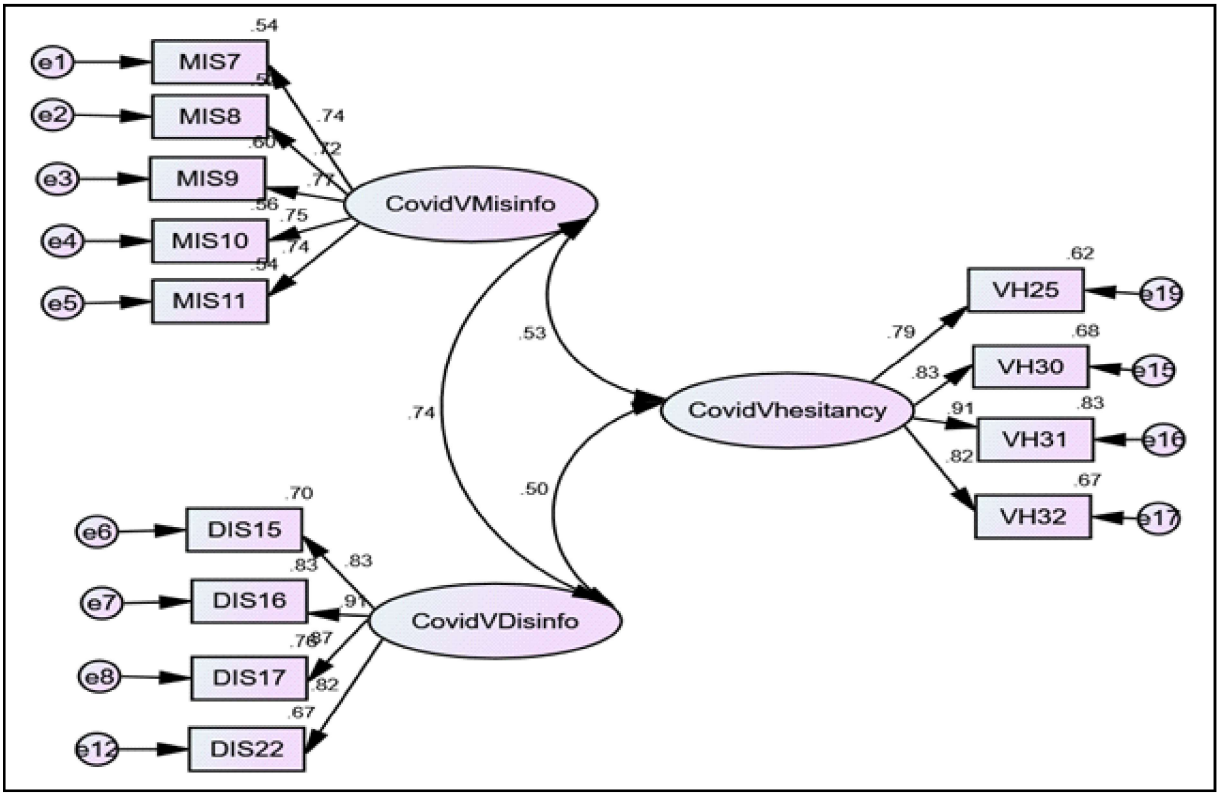

Figure 3. Pooled CFA illustrates the factor loading for all items

Model indices: *P= 0.000, x^2= 145.673, df= 62, GFI= 0.913, NFI= 0.927, CFI= 0 .956, TLI= 0.945, RMSEA= 0 .078(0.062-0.095), RMR=0 .095, SRMR= 0.047*

Figure 3 presents the result of the CFA. Based on Kline's (2005) recommendation, four goodness indices: chi-square (χ^2) with degree of freedom, mean-square residual (SRMR), standard root mean approximation (RMSEA) with 90% confidence interval, and comparative fit index (CFI) were used to assess the model fit. According to Kline (2005), RMSEA <0.10, CFI =0.90, and SRMR < 0.10 are generally considered favourable. Thus, the model fit indices: (χ^2) =145.673, df= 62, RMSEA= 0.078(0.062-0.095), CFI= 0.956, and SRMR= 0.047 show that the model is acceptable for structural modelling.

Table 6. Construct reliability and validity

Constructs	No of Items	Composite reliability (CR)	Croncbach's Alpha (CA)	Average Variance Extract (AVE)
CovidVMisinfo	5	0.857	0.820	0.546
CovidVDisinfo	4	0.890	0.895	0.669
CovidVhesitancy	4	0.904	0.850	0.703
	13			

Table 6 presents values of reliability and validity for the three constructs, which must be established before engaging the model in structural equation modelling.

(a) Construct reliability

Table 6 shows that each construct has estimates of CA and CR >0.70 as recommended by Fornell and Larcker (1981). Thus, all the constructs are adequately reliable.

(b) Convergent validity

This was assessed using Average Variance Extracted (AVE) for each construct. Table 6 shows that all the three constructs have AVE value of 0.50 and above as recommended by Fornell and Larcker (1981), Hence, the convergent validity of the constructs was acceptable.

(c) Discriminant validity

Using Fornell and Larcker's (1981) recommendation, the discriminant validity of the constructs was acceptable since the square roots of the AVEs are greater than the Inter-correlations of the constructs.

Table 7: Discriminant validity

	CovidVhesitancy	CovidVDisinfo	CovidVMisinfo
CovidVhesitancy	0.838		
CovidVDisinfo	0.498	0.818	
CovidVMisinfo	0 .530	0.736	0.739

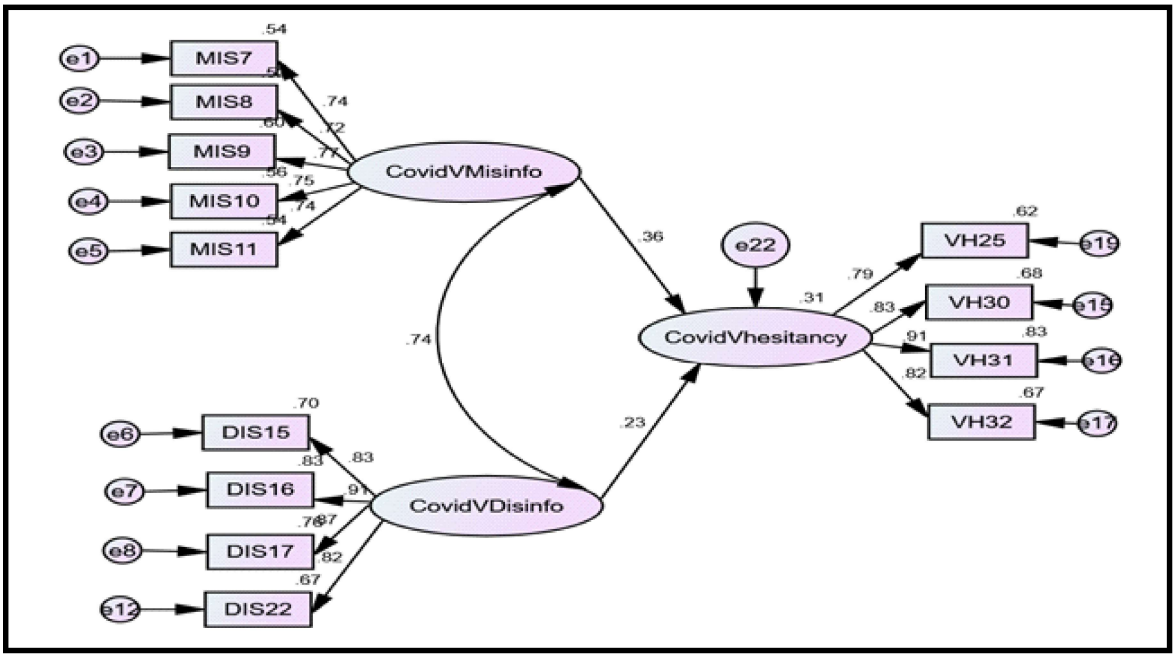

Figure 4. Structural model

Figure 4 presents the result of structural model assessment, confirming the relationships among the variables: the correlation between COVID-19 Vaccine Misinformation and COVID-19 Vaccine Disinformation, and the predictive effects of both on COVID-19 Vaccine hesitancy.

Hypothesis Testing

Table 8 presents the hypothesised paths of the structural model (as shown in Figure 4), showing the correlation and causal effects between variables. Maximum likelihood estimation was used to generate the estimates. The null hypotheses (H_0) were rejected

Table 8. Hypothesised relationships

	Hypothesised Relationships			Unstandardised Regression coefficients				Standardised Regression coefficients	Remark
				B	SE	CR	P	β	
H_{01}	CovidVMisinfo	<-->	CovidVDisinfo	0.800	0.114	6.988	0.000	0.736	Null hypothesis rejected
H_{02}	CovidVMisinfo	-->	CovidVhesitancy	0.421	0.132	3.194	0.001	0.357	Null hypothesis rejected
H_{03}	CovidVDisinfo	-->	CovidVhesitancy	0.273	0.124	2.211	0.027	0.235	Null hypothesis rejected

Note: CovidVMisinfo = COVID-19 Vaccine Misinformation, CovidVDisinfo = COVID-19 Vaccine Disinformation, CovidVhesitancy = COVID-19 Vaccine Hesitancy

Research Hypothesis 1: There is no significant relationship between COVID-19 Vaccine Misinformation and COVID-19 Vaccine Disinformation.

Table 8 shows a significant relationship between the exogenous variable (COVID-19 Vaccine Misinformation) and the exogenous variable (COVID-19 Vaccine Disinformation) among LIS professionals in Nigeria ($\beta = 0.736$, $p = 0.000$). The null hypothesis was therefore rejected. This means that COVID-19 Vaccine Misinformation had strong significant relationship with COVID-19 Disinformation among LIS professionals in Nigeria. They were found to jointly account for 30.6% of variance in COVID-19 Vaccine hesitancy among LIS professionals in Nigeria ($R^2 = 0.306$).

Research Hypothesis 2: COVID-19 Vaccine Misinformation does not have positive effect on COVID-19 Vaccine hesitancy.

Table 8 shows a significant relationship between the exogenous variable (COVID-19 Vaccine Misinformation) and the endogenous variable (COVID-19 Vaccine hesitancy) among LIS professionals in Nigeria ($\beta = 0.357$, $p = 0.001$). The null hypothesis was therefore rejected. This means that COVID-19 Vaccine Misinformation had significant positive effect on COVID-19 Vaccine hesitancy among LIS professionals in Nigeria. This suggests that the COVID-19 Vaccine Misinforma-tion possibly caused the delayed response of LIS professionals to COVID-19 Vaccination.

Research Hypothesis 3: COVID-19 Vaccine Disinformation does not have positive effect on COVID-19 Vaccine hesitancy.

Table 8 shows a significant relationship between the exogenous variable (COVID-19 Vaccine Disinformation) and the endogenous variable (COVID-19 Vaccine hesitancy) among LIS professionals in Nigeria ($\beta = 0.235$, $p = 0.027$). The null hypothesis was therefore rejected. This means that COVID-19 Vaccine Disinformation had significant positive effect on COVID-19 Vaccine hesitancy among LIS professionals in Nigeria. This suggests that the COVID-19 Vaccine Disinformation possibly weakly affected the positive response of LIS professionals to COVID-19 Vaccination.

at $p \leq 0.05$.

Discussion

Demographic characteristics of the respondents provided relevant information about the participants in this study. The mean age of the respondents was 37.48 years (Std Deviation = 1.018). More than one third 82 (36.9%) of the respondents had master's degree, while close to one fourth, 54 (24.3%) of them had PhD. More than half of the respondents 135 (60.8%) had over 10 years of professional experience.

Findings revealed that the extent of COVID-19 vaccine misinformation and disinformation among LIS professionals in Nigeria was at a low level. For example, it is clear that they were not dissuaded by COVID-19 vaccine misinformation such as: there are ulterior motives behind the COVID-19 vaccination, COVID-19 vaccines are not safe, COVID-19 was manufactured in the lab in order to sell COVID-19 vaccines, COVID-19 vaccines are dangerous; they are not like other vaccines, COVID-19 vaccines affect fertility, and COVID-19 vaccines cause still birth among others. Similarly, Loomba et al. (2021) reported the existence of COVID-19 vaccine misinformation among people in the UK and the USA.

Moreover, majority of LIS professionals in Nigeria did not give in to COVID-19 vaccine disinformation such as: Be warned; COVID-19 vaccines are biological weapons, COVID-19 vaccines are developed to reduce African population; don't take any of them, COVID-19 vaccines are meant to alter genetic makeup of people; avoid them, COVID-19 vaccines will only make the western world richer; so, it not necessary to take any of them, COVID-19 vaccines are ordinary mixture of multivitamins; Please go natural, Be warned; COVID-19 vaccines trigger hypertension, COVID-19 vaccines trigger heart attack. Please, avoid them, and many people died as a result of taking COVID-19 vaccine than of the disease itself. This suggests that many of the LIS professionals in Nigeria were not victims of COVID-19 vaccine misinformation and disinformation. Furthermore, it equally suggests that probably, many of them had adequate information literacy skills. More so that Prabagar et al. (2022) opined that COVID-19 vaccine disinformation remains an enemy to a healthy society.

Further findings revealed that the extent of COVID-19 Vaccine hesitancy among LIS professionals in Nigeria was at a low level, generally. For instance, more than half of them believed they needed the vaccine, they were interested in taking the vaccine, and eventually took the vaccine but delayed taking the vaccine because they were sceptical about its effectiveness and side effects. This indicates that the majority of the LIS professionals were well informed to make positive and appropriate decision to take COVID-19 vaccine, though not quickly. In all, a little above one third, 34.4% of them were yet to take the vaccine. This corroborates the findings of Troiano and Nardi (2021) that vaccine hesitancy occurred among people based on certain scepticism towards the safety of the COVID-19 vaccine.

The study has shown a significant relationship between COVID-19 vaccine misinformation, disinformation and COVID-19 vaccine hesitancy. Findings have revealed that COVID-19 vaccine misinformation had a very strong relationship with COVID-19 vaccine disinformation. Both COVID-19 vaccine misinformation and COVID-19 vaccine disinformation had positive effect on COVID-19 vaccine hesitancy. This suggests that greater the level of COVID-19 vaccine misinformation and COVID-19 vaccine disinformation, the greater the level of COVID-19 vaccine hesitancy. This corroborates the submission of Gisondi, et al. (2022) that vaccine hesitancy and vaccine refusal are triggered by COVID-19 misinformation and disinformation. A striking finding is that COVID-19 vaccine misinformation had more positive effect ($\beta = 0.357$, $p = 0.001$) on COVID-19 vaccine hesitancy than COVID-19 vaccine disinformation had ($\beta = 0.235$, $p = 0.027$). This corroborates the submission of Loomba et al. (2021) that misinformation is more strongly associated with declines in vaccination intent.

Conclusion

The research model has expounded and confirmed relationships among COVID-19 vaccine misinformation, disinformation, and COVID-19 vaccine hesitancy. This study contributes to the existing knowledge on the effect of COVID-19 vaccine misinformation, disinformation, on COVID-19

vaccine hesitancy even at a low level. This suggests that even a slight acceptance of misinformation and disinformation is detrimental to disease curtailing initiative such as vaccination. Thus, LIS professionals should be agents of positive change by creating necessary awareness that could spur high detection of misinformation and disinformation. Other relevant stakeholders should step up initiatives in this regard. Efforts should be geared towards curbing disinformation and misinformation because they pose a grave danger to public health now and in the future. There should be sanctions to an individual, groups of individuals and organisations spreading anti-vaccine information (i.e. misinformation and disinformation).

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From Crisis to Continuity: Analysing the Impact of COVID-19 Pandemic on Public Records and Archives Management in The Gambia

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Abstract

The Coronavirus Disease (COVID-19) heralded a dreadful global disaster that had a collateral effect on many businesses. It affected people, information, and global economies. However, its impact on public records and archives management is under-researched in Africa, particularly in The Gambia. Hence, the purpose of this study was to assess the impact of the COVID-19 pandemic on public records and archives management in The Gambia. Adopted for the survey is pragmatic research paradigm, which employs mixed methods using a purposive sample of 65, constituting 31% of a population of 211, comprising heads of Public Records and Archives staff and National Records Advisory Committee members. The ISO 31000:2018 Risk Assessment tool was employed as the theoretical framework. A questionnaire and telephone-based interview were administered to collect data. Quantitative data was analysed descriptively using IBM Statistical Packages for Social Science (IBM SPSS), while qualitative data was analysed based on the study objectives. The research shows that a significant minority confirmed information leakage during the COVID-19 pandemic, primarily through social media, phone, and email. Most records and archives are in physical format, as established by 59.1% of respondents. The records sector responded poorly due to inadequate capacity, emergency policies, and interventions. Most respondents claimed a lack a disaster plan, with 67.7% of respondents finding it ineffective in mitigating COVID-19's impact on records and archives, and 82.4% confirming inadequate documentation during the pandemic. Although the COVID-19 pandemic has moderately impacted Public Records and Archives Management in The Gambia, with staff being protected more than information, the effect severely affected archival services. The study recommends robust risk plans, digitalisation, professional capacity building, adequate resources, effective monitoring, and decentralisation, among others.

Keywords: COVID-19, Pandemic, Records and Archives Management, Risk Assessment; The Gambia

Introduction

Documentary heritage is a vital resource that offers a historical perspective on the techniques that government, citizens, and the international communities have used to tackle pandemics in the past; thus, it is significant to preserve records regarding a pandemic for future research (ICA, 2020). The need to preserve the records is further buttressed through a joint universal declaration by the International Conference of Information Commissioners and International Council on Archives (ICA) in collaboration with the International Science Council's Committee on Data (CODATA), The Association of Records Managers and Administrators (ARMA) International, Research Data Alliance, Digital Preservation Coalition, World Data System, and UNESCO Memory of the World in their statement: COVID-19: The duty to document does not cease in a crisis, it becomes essential (ICA, 2021). The statement indicates that archives store actions, decisions, and memory, which are reliable sources of information that ensure the security and transparency of administrative activities. Additionally, archival institutions are responsible for preserving and maintaining records during the pandemic.

According to ICA, information must be managed appropriately. In achieving this goal, solid electronic administration infrastructures should be built to guarantee effective and efficient management and the rights of the citizenry. Moreover, access to quality information is critical in combating fake news in times of uncertainty. Again, transparency enhances society's control of government actions, including its responsibility to protect individual liberties and exercise social rights in the fight against the virus. Likewise, working towards greater transparency enhances citizens' confidence in public institutions. Finally, records management and archives should be recognised as public assets and principal elements for achieving SDG (Sustainable Development Goals) 2030 concerning access to information (ICA, 2021).

COVID-19, a highly infectious SARS-CoV-2 disease, is widely known to have emerged in Wuhan, China, in late 2019. Its label of '2019' or '19' in the name resulted from the year it happened. However, Platto et al. (2021) argued that the true origin of COVID-19 was yet to be ascertained. They indicated that it violently exploded in Wuhan, China, and quickly spread worldwide, creating a global pandemic, as Ghebreyesus, Director-General of the World Health Organisation (WHO), declared. In the declaration, Ghebreyesus (2020) called on countries to take action to contain the virus with more effort and aggression. Consequently, governments around the world undertook stringent precautions to manage the disease. These protocols include lockdowns in many countries around the globe. Hence, this paper examined how the unprecedented COVID-19 pandemic disruptions have impacted The Gambia's public records and archives management.

The Gambia is in West Africa with the shape of a slither and a total area of 11,300 sq. km (land 10,000 sq. km, water 1,300 sq. km). Its only land boundary is with Senegal at 740km (about 459.81 mi) in the south-westerly direction. It has the Atlantic Ocean, facing a coastline measuring 80km (approximately 49.71 mi), which runs south from Buniada Point on Jinack Island to the Allahein River in Kartong. The Gambia River courses east for around 487 km (about 302.61 mi) through the country's middle and finally passes over Koina village, northeast of the border with Senegal (Access Gambia, 2023). Its population is 1,989,790, of which 51% are female and 49% male. There are 42 districts and eight local government areas (LGA). The Gambia is Africa's smallest non-island country, and its capital is Banjul [Bathurst until 1973] (Britannica, 2022). The Gambia National Records Service (NRS) is responsible for public records operations. It was established by an Act of Parliament in 1993 to ensure good record-keeping practices within the public service and other institutions (National Records Service Act, 1093). The Act also established a records advisory committee, which shall be responsible for the general records management policy, advise the Minister on public records management policy matters, and advise the Director of the Service on other issues that may be specifically assigned.

After the WHO declared COVID-19 as a global pandemic on 11 March 2020 and instructed guidelines and protocols to contain the virus, The Gambia government, in compliance, declared seven successive states of public emergency (SoPE) in 2020 from 27 March to 17 September (Nabaneh, 2021). The use of these emergency powers to cope

with COVID-19 in The Gambia prescribed strict measures, including the mandatory use of face masks in public places, the closure of schools and non-essential businesses, a ban on public gatherings, and a 22:00 to 05:00 (local time) curfew. The Office of The President (OP), through the Secretary-General in a circular dated 24 March 2020, scaled down on public service staff during COVID-19 in a step-up endeavour to contain the spread of COVID-19, while allowing essential staff to report to work. The heads of departments were then tasked to determine these necessary staff (OP, 2020). Whilst the archives staff were considered non-essential and asked to stay home with archival reference services unavailable, the records offices continued operations using a combination of paper and electronic system during the lockdowns.

Statement of the Problem

The breakout of COVID-19 affected day-to-day life and slowed world trade and movements. Thousands of people were sick or killed due to the spread of this disease, and businesses were disrupted. The impact of COVID-19 was extensive and had far-reaching consequences on healthcare, social interactions, national economies, and information assets (Haleem, Javaid, and Vaishya, 2020). The outbreak of COVID-19 also impacted the archives and records management field as normal businesses were affected. Under normal circumstances, archivists and records managers keep and retrieve records for users to consult on daily basis. During COVID-19, physical contact was prohibited. This resulted in organisations using online platforms such as emails, Zoom and MS Teams, to communicate, share information and hold meetings, whilst information was hardly documented as per the records management procedures. Alyssa (2020) reveals cases where records management procedures were altered in Australia amongst the Australian public Agencies. According to MacDonnell (2021), the performance of archivists at academic archives was hindered during the COVID-19 pandemic, as archivists were forced to work from home. In Africa, a study done by Muchefa (2021) shows that the security of records was compromised in the case of Zimbabwe heritage institutions, as official documents were leaked through phones or social media during the pandemic. In 2020, The Gambia experienced seven national lockdowns, which affected the status quo of records and archives management in the Gambia. This study found limited research on the impact of COVID-19 on public records and archives management in Africa. Furthermore, there is no evidence from the extensive Internet search to suggest any existence of adequate evaluation of the COVID-19 impacts on The Gambia public records and archives management. Hence, this study seeks to assess the impact of COVID-19 on public records and archives management in The Gambia using ISO 31000: 2018 Risk Management Framework.

Objectives of the Study

The main objective of this study was to examine the impact of the COVID-19 pandemic on public records and archives management in The Gambia. Specifically, the study aims to:

1. Determine how the COVID-19 pandemic became a risk to records and archives.
2. Ascertain the disruptions caused by the COVID-19 pandemic to records and archives operations.
3. Identify what emergency/disaster response plan was in place before the COVID-19 pandemic.
4. Find out the disaster plan implementation used to contain the COVID-19 pandemic on records and Archives.
5. Investigate how the COVID-19 pandemic risk was monitored in records and archives units.

Literature Review

A comprehensive literature review and analysis to examine the magnitude of the COVID-19 pandemic's impact on records and archives management was conducted and disclosed the following findings: A 2020 research report by Alyssa aiming to determine the challenges faced by managers in managing records during COVID-19 concluded that COVID-19 had changed the status quo of records management mandates, regulations, and responsibilities as operations had to be entirely altered to cope with the pandemic demands. Likewise,

Ncaagae-Mbe (2021), in a study, "Managing Records in the COVID-19 Era at the Botswana Communications Regulatory Authority (BOCRA)," revealed that the nationwide lockdowns impacted records management to the extent that BOCRA inevitably provided online services to allow access to information. The findings further exposed that BOCRA lacked a disaster risk plan, and there exited misfiling and loss of records (Alyssa, 2020). Additionally, Alyssa quoted a report commissioned by AvePoint highlighting that many Australian public agencies were not operating in a cloud environment before COVID-19. The report indicated that only 31% had upgraded to cloud-based applications, although 39% were migrating due to the pandemic demand. Another issue raised in the report was the case of a member of staff who could not work from home because all the information was in physical format, and it was not permissible to take those records home. An entire department could not work from home as they would lose access to all their information. To mitigate these effects on records, the National Archives and Records Administration (NARA) of North America released some guidelines about managing records while teleworking [working from home]. One of the guidelines was that some teleworking employees might use personal email accounts, electronic messaging applications, or video conferencing tools to communicate for work (Alyssa, 2020).

COVID-19 brought challenges associated with a global health and information crisis. Although global health crises share common characteristics across national contexts, each country is said to have unique political and social systems that affect information behaviours and environments (Xie et al., 2020). Disruptions were experienced in many aspects of people's lives, including their professional lives (Berg et al., 2021). Records creation, storage, and management routines were disrupted due to working from home, which would likely cause substantial flaws in future knowledge (Haraldsdóttir, 2022). In the UK, it was recorded that the COVID-19 pandemic initially unfolded from January to February 2020, leading the government to declare a countrywide lockdown for 13 weeks from March to June 2020. In this period, workers were encouraged to work from home or were furloughed under a government scheme (Machovec, 2020). Another survey conducted in the UK by the National Archives in 2020 on the COVID-19 pandemic's impact on the broader archive sector reported that the level of COVID-19 impacts and alterations to services remains unknown (National Archives of the UK, 2020).

In Botswana, Mosweu (2020) investigated the impact of the escalating fake news on social media during the COVID-19 pandemic on records and archives management. The findings exposed the technological lapses. Capturing, using, and preserving social media content was significantly affected, placing Botswana at risk of losing its digital heritage. Muchefa (2021) also researched Zimbabwe's COVID-19 response in the heritage sector, and the report showed that the pandemic complicated heritage preservation and physical access and put further strain on resources available to these institutions. Consequent to nationwide lockdowns, virtual meetings became the most common feature in Zimbabwe, and there remained a gap in addressing strategies for handling records generated in such an environment (Muchefa, 2021).

MacDonnell (2021) researched the impact of COVID-19 on small academic archives and the effectiveness of disaster plans and scholarship in mitigating damage and fallout at Liberal Arts College in the Oberlin Group of Libraries. The findings revealed that archivists in the United Kingdom potentially risked their health by going to work in person as mandated. The study further revealed that the archivists were forced to work remotely, thereby hindering effective appraisal, access, and digitisation of many paper records. Digital archives and electronic collections face accessibility issues while employees adapt to remote work with the added burden of staff occasionally having limited access to computers, relevant digital resources, and an Information Technology department (MacDonnell, 2021). In their research investigating the archives of the COVID-19 crisis in Bulgaria, Popov et al. (2022) reported that Bulgaria's heritage sector allowed limited onsite access and emphasised remote access. Moreover, it took time to adapt rules on disinfecting the documents and finding working mechanisms that met the interests of all parties.

Recent research by Gude and Asari (2022) investigated the COVID-19 dynamic archive management by broadcasters at Radio Republic

Indonesia. Their findings revealed no written policy regarding the creation and format of such archives. The dynamic archives were created without official scripts, and the borrowing process was without straightforward procedure, as the process relied on the manager's memory. This brought complications when the pandemic archive increased in number. Similarly, according to Ramli et al. (2022), the Malaysia National Archives temporarily closed all the physical research halls in 2021. The researchers could not directly access the physical public archives during this period. They resorted to online finding aid (OFA). A virtual archives exhibition was then introduced (Ramli et al., 2022).

Kosciejew's (2021) comparative thematic analysis from the official websites of the Australian National Archives, the Canada Library and Archives, the New Zealand Archives, the United Kingdom, and the United States National Archives revealed that from March to May 2020, national archives posted formal public-facing COVID-19 announcements to discuss the closure of physical locations and spaces, maintaining reduced services, and offering remote access (Kosciejew, 2021).

Nojavan, Salehi, and Omidvar (2018) and Alexander (2019) asserted that in many disasters, people worldwide rely primarily on emergency personnel, local authorities, and disaster management agencies during a major incident. Additionally, Holgersson et al. (2016) posited that individuals rarely consider themselves key players and first responders before, during, or even after significant incidents. This fact is buttressed by Muchefa (2021), who argues that most heritage institutions had disaster and risk reduction strategies but were of little use during COVID-19.

In Muchefa's (2021) appraisal report, the pandemic exposed policy and capacity gaps in emergency preparedness plans. Again, there were significant lapses in the handling of records. The findings also revealed no guidelines on what should happen to official records created by officers working from home have been issued. While the Digital Records Management Framework gives guidelines for overall electronic records management, it does not consider those generated in such COVID-19 scenarios. Consequently, official documents began to be leaked as people used mobile phones to take images or deliberately shared such documents on social media COVID-19 (Muchefa, 2021).

The study conducted by Asamoah, Akussah, and Musah (2018) in Ghana surveyed 19 ministries and the Public Records and Archives Administration Department (PRAAD) and examined public institutions' disaster management approaches for public records. Their findings highlighted high unpreparedness. In addition, inadequate budgets for PRAAD and the records departments are some factors leading to information disasters. Buttressing the issues with disaster plans, MacDonnell (2021) contends that archival disaster management generally does not explicitly indicate staff training for pandemic situations, managing a scattered workforce, and limiting the spread of disease.

Theoretical Framework

In assessing the impact of the COVID-19 pandemic on The Gambia's public records and archives management, ISO 31000: 2018 Risk Management Framework was employed for this study. The Framework is a standard that guides organisations in managing risks and uncertainties relating to assets, procedures, environment, and needs in general. It is used in this study because of its suitability to any form of risk management, and its constructs, according to ISODOCS (2022), are: a) Identifying Risk: Enormous amounts of data are rapidly processed at increasing rates. b) Analysing and Assessing Risks: This step helps institutions understand how risk is assessed, analysed, and managed to facilitate continual performance improvement. c)Response Planning: This stage guides the procedures of planning response activities to be integrated into the organisation-wide risk management workflow to carefully plan a response, identify stakeholders, define objectives, identify alternatives for actions, analyse the repercussions and benefits of each option, and select an optimal course (s) of actions, d) Implementation: This phase addresses the implementation of risk management. It helps risk preparation before it happens through assessment, response planning, and monitoring of the impact on business performance. e) Monitoring and Review: This process has two steps. While monitoring looks at current affairs, the review evaluates previous outcomes to examine what went

right or wrong. They are integral components that complement each other for institutions to continuously monitor and review the risks of the program and other business aspects (ISODOCS, 2022).

Methodology

This study applied pragmatism as a research paradigm and a mixed approach using concurrent/ cross-sectional data collection. There were sixty-two departments in The Gambia, and 44 of them participated. The study population was 211, comprising the Records Office staff (200), archives staff (3), and the National Records Advisory Committee (NRAC) members (8). The study used 31% of the study population, even though Bullen and Brack (2013) posited that 10% of the population is a good sample if that number does not exceed 1000. The sample size was summed to 65, comprising 62 heads of the Records Office, 1 head of the Archives unit, and 2 NRAC members. The respondents were selected because of their oversight, expertise, and critical functions. NRAC members were the target for the qualitative data, while the quantitative method questioned the heads of records and archives units. The justification for choosing the mixed mode is that the approach provides a more profound understanding of phenomena and presents a more robust inference than a single research approach. The two units covered in this study were the records unit, constituting 43 respondents (97.7%), and the archives unit [there was only one archives unit], represented by 1 (2.3%) respondent.

A survey questionnaire and phone-based interviews were utilised for data collection. The Google form questionnaire was administered to the heads of the records and the archives units via emails and the National Records Service WhatsApp Forum. The face-to-face method was carried out for one of the respondents, and the telephone interview for the other due to physical distance. The interview was recorded using WhatsApp voice notes, which were transcribed, coded, analysed, and interpreted, while the quantitative data were analysed using IBM SPSS.

Response Rate

Forty-six respondents from a sample of 65 participated in this research and produced a71% response rate. The summary of the response is presented in Table 1.

Table 1:Response Rate

Category	Distribution	Returns	Response Percentage (%)
Records Units	62	43	69
Archives Unit	1	1	100
	Target Interviews	Interviewed	
NRAC	2	2	100
Total	**65**	**46**	**71**

Source: Field Data, 2023

Demographic and Background Information

This paper indicates that there were sixty-two departments targeted in this research, and 44 participated. Two units were covered: the records unit, constituting 43 respondents (97.7%), and the archives unit, represented by 1 (2.3%) respondent. The gender composition of respondents for the quantitative survey is 22 (50%) females and 22 (50%) males. However, the interview respondents were two males (100%). The designations of the respondents were Records Officer 11 (25%), Assistant Records Officer 8 (18.2%), Senior Records Officer 7 (15.9%), Records Supervisor 7 (15.9%), Records Clerk 7 (15.9%), Principal Records Officer 3 (6.8%), and Senior Records Supervisor 1 (2.3%). Thirty-six (81.8%) records units of this study were restructured, 7 (15.9%) were unrestructured, and 1 (2.3%) was 'Not Applicable' [refers to the National Archives, which has a different structure from the records unit].

Findings

COVID-19 Pandemic as a Risk to Records and Archives

Table 2: Perceived Pandemic Risk to Records and Archives and Archives (n=44)

Risk	Frequency	Percentage
Information leakage	9	20.5
Records not disinfected	4	9.1
Sources of information leakage		
WhatsApp	29	65.9
Email	25	56.8
Social media	11	25.0
Phone	7	15.9
Zoom	7	15.9
Facebook	3	6.8
Google	2	4.5
Teleconference	1	2.3

The first objective sought to determine how the COVID-19 pandemic was a risk to records and archives. Table 2 shows the perceived risks to records and archives during the pandemic mentioned were information leakage ((20.5%) and records not disinfected (9.1%). The prominent sources of information leakage mentioned by the respondents mentioned were: WhatsApp (65.9%), E-mail (56.8%), Social media (25%), Phone (15.9%), and Zoom (15.9%).

Twenty-six (59.1%) of respondents stated that records systems were physical, 17 (38.6%) were Hybrid (Electronic and Manual), and 1 (2.3%) were electronic. Twenty-three (52.3%) rated the impact of lockdowns on records and archives as medium, 11 (25%) rated it as high, 9 (20.5%) rated it as low, and 1 (2.4%) rated it as extreme. Fifteen (34.1%) of respondents rated the impact on records and archives staff as low, 13 (29.5%) rated it as high, 12 (27.3%) rated it as medium, and 4 (9.1%) rated it as extreme. Impact on file users was rated as low by 16 (36.4%) respondents, medium by 15 (34.1%) respondents, high by 10 (22.7%) respondents, and extreme by 4 (9.1%).

In the interviews, respondents highlighted additional risks, such as challenges in handling paper records (due to fear of virus transmission), confidentiality, security, and storage of records. One of the respondents expressed the following views:

> There was a delay in turnaround time, timely information sharing, and treatment of files because of the scaling down of the records personnel."

Another interviewee responded:

> We sent a circular that instructed records personnel to keep away records for 24 hours before using them. Consequently, records' timely and proper use and storage was affected."

COVID-19 Pandemic Disruptions to Records and Archives Operations

The second objective sought to identify the disruptions caused by the COVID-19 pandemic to records and archives operations, and the results from the responses are as follows: 30 (78.9%) respondents indicated that normal operations changed. Twenty-four (54.5%) respondents reported a backlog of work, 14 (31.8%) stated that their office transitioned to remote work. Nine (20.5%) mentioned that online services were offered as an alternative, 2 (4.5%) respondents noted that their records and archives units continued to operate during the lockdown. Nine (20.5%) respondents indicated that some staff stayed home 35 (79.5%) reported that their staff worked on shifts. Twenty-nine (65.9%) respondents stated that their records office staff practiced COVID-19 health precautions 17 (38.6%) felt that their records staff were not adequately prepared for the effects of COVID-19. Twenty-nine (65.9%) respondents expressed that their records staff were at high risk. One (2.3%) respondent indicated that the National Archives was shut down during the COVID-19 pandemic. It is worth noting that there was only one public National Archives. The findings further revealed information inaccessibility, which was confirmed by one of the interviewees who stated:

> The public had limited access to the archives because of the lockdown that reduced the number of staff. As a result, facilitating the use of the archives became challenging.

Another interviewee concurred and said that:

> There were no visitors at the archives.

Eight (18.2%) respondents reported that some Action Officers took files home to work on them, whilst another 8 (18.2%) mentioned that action officers treated the records independently without the records office. Thirty-two (72.7%) respondents indicated a delay in Action Officers acting on files fifteen (41.7%) reported that Action Officers used their personal email accounts for official communication. Regarding management intervention, nine (4.5%) respondents stated that management authorized records and archives to be handled differently and seven (31.8%) asserted that management bypassed the records office in managing COVID-19 records. Again, nineteen (86.4%) respondents indicated that the National Records Service did not issue a policy instruction to tackle the changes brought about by the pandemic. Nine (20.5%) respondents reported that some electronic records and archives, such as emails, were lost or poorly documented. Eighteen (40.9%) indicated that COVID-19-related information was managed differently, whereas 16 (36.4%) confirmed that COVID-19-related press releases were documented in the Records Office. Moreover, 12 (27.2%) respondents stated that COVID-19 records and archives were not properly managed, while 9 (20.5%) respondents claimed that non-experts managed COVID-19 records and archives. The results also indicated that 33 (75.0%) respondents reported using paper-based records systems, and only 1 (2.3%) responded using electronic records.

The results further revealed that 26 (59.1%) respondents stated that vital records and archives were not prone to risks due to the COVID-19 pandemic, whereas 18 (40.9%) respondents perceived that vital records and archives were prone to risks. Twenty-four (54.5%) respondents stated that action officers sent copies of letters to the records office for filing while working from home, and 13 (29.5%) reported the contrary. Seventeen (38.6%) respondents stated that follow-ups were made to ensure that Action Officers brought file copies for filing. Conversely, 6 (13.6%) respondents reported that no follow-ups were made. Twenty-three (52.3%)

respondents stated that the lack of Personal Protective Equipment (PPE) was the reason for not implementing COVID-19 protocols, 11 (25.0%) respondents claimed that disbelief in COVID-19 was the reason, and 12 (27.3%) respondents indicated that the lack of enforcement by authorities was the reason.

On the impact of the COVID-19 pandemic on records and archives unit operations, recording procedures, records and archives staff, and file users, findings revealed that 18 (40.9%) respondents indicated that the impact of the pandemic on records and archives unit operations was medium, 16 (36.4%) respondents stated that the impact was low, 7 (15.9%) respondents reported a high impact, and 2 (4.5%) respondents described the impact as extreme. Seventeen (38.6%) respondents indicated that the impact of the pandemic on recording procedures was low, 15 (34.1%) respondents suggested a medium impact, 9 (20.5%) reported a high impact, and 1 (2.3%) stated that the impact was extreme. Seventeen (38.6%) respondents indicated that the impact of the pandemic on records and archives staff was medium, 14 (31.8%) respondents reported a low impact, 6 (13.6%) respondents suggested a high impact, and 2 (4.5.%) respondents described the impact as extreme. Twenty (45.5%) respondents indicated that the impact of the pandemic on file users was medium, 13 (29.5%) reported a low impact, 4 (9.1%) stated a high impact, while 2 (4.5%) respondents described the impact as extreme. The lockdown resulted in limited public access to the archives. The interviews revealed that the National Archives was seriously impaired during the lockdowns as researchers were not accessing the archives. However, the Records Offices continued working on a scaled-down shift basis, as confirmed by an interviewee that:

> We ensured that Records Offices continued working at a scaled-down level and shifts basis to avoid completely shutting down the records units." Another respondent confirmed and said: "A lean staff on the ground continued operations while others were temporarily laid off.

One of the interviewees mentioned the lack of adequate protective gear and sanitizer materials for records personnel. The recording and processing of incoming correspondence also faced difficulties. The interviewees confirmed that no visitors were allowed at the archives during the lockdowns. An interviewee stated that staff members were demoralised as they had to stay home. One of the interviewees perceived the impact of the COVID-19 pandemic on the records and archives cadre as mild, although the interviewee acknowledged that transactions were slowed down.

Emergency/ Disaster Response Planning

The third objective aimed to identify the disaster/ emergency response plan in place before the COVID-19 pandemic. The study found that 25 (56.8%) respondents indicated their workplaces did not have a disaster plan, 12 (27.3%) said they were unsure whether their workplaces had a disaster plan. Among the respondents who indicated that their workplaces had emergency plans, different plans mentioned include Disaster Management Plan, Vital Records Plan, Business Continuity Plan, and Contingency Plan. In another development, nine (20.5%) noted that the National Disaster Management Office did not effectively address information disasters; and 2 (4.5%) said there were no guidelines for action officers working from home.

Two (4.5%) respondents indicated that records and archives personnel were not trained in managing information disasters. Another two (4.5%) stated that the records and archives staff did not have adequate skills to address the impact of COVID-19 on their operations. One (2.3 %) of the respondents felt that the impact of COVID-19 on the records and archives units was not adequately addressed. Five (11.4%) respondents indicated that the National Records Service did not provide records and archives service guidelines during the pandemic. A majority, 26 (59.1%) of the respondents stated that no training was provided for managing a scattered workforce. One respondent [from the only public archives] reported the absence of guidelines for digital COVID-19-related archives, lack of an archival access policy, unclear guidelines for new pandemic archival services, and a perceived lack of urgent intervention from the National Records Service to address COVID-19 effects.

One of the interviewees confirmed that the records and archives cadre was unprepared for the

pandemic, with manual records management practices being the norm. Another interviewee confirmed this finding by stating:

> We were largely unprepared; the records were manual, and it was business as usual. Some measures were only implemented after the COVID-19 emergence to mitigate the impact.

The interviewee further mentioned:

> The departments were given guidelines on handling letters. Based on the advice from the Ministry of Health, instruction was issued to place records in a box for 24 hours before touching them to reduce the coronavirus transmission rate:

The interviewees were uncertain about a written information disaster risk plan for records and archives in the public sector. However, one of the interviewees reported that a disaster recovery site for electronic records existed. The two interviewees attributed the absence of a written information disaster risk plan for records and archives to policy and capacity gaps.

Disaster Risk Plan Implementation

The fourth objective sought to find out the disaster plan implementation used to contain the COVID-19 pandemic on records and archives. Fifteen (34.1%) respondents indicated that they had implemented a disaster risk plan to address the COVID-19 pandemic's impact on records and archives. The majority, 29 (65.9%), responded that they had not implemented such a plan. A minority of 10 (22.7%) stated that the plan effectively addressed the COVID-19 impact. Most respondents 26 (59%) indicated that no adequate budget was allocated to mitigate the possible effects of the COVID-19 pandemic on records and archives. A significant number of responses 18 (40.9%) indicated that management did not view disaster management as integral to their responsibilities. One interviewee believed that the impact of the pandemic was adequately handled, even with limited resources. According to this participant the measures implemented successfully mitigated the risks of COVID-19 on staff. The interviewee stated that government transactions were not adversely affected, although the work was slow. The interviewee further stated:

> I think the measures we put in place mitigated the risks of COVID-19, as far as the staff/ personnel were concerned. In addition to minimizing the instances of transmitting the virus, government transactions were not adversely affected because work continued even though it was slowed down." On the contrary, another respondent argued, "The disaster risk management was ineffective because the guidelines affected the proper processing of the correspondence."

The interview revealed that no policy intervention was taken during COVID-19 by the Advisory Committee. One respondent confirmed this by stating:

> The NRAC was unable to meet and could not provide any advice during that period.

COVID-19 Risk Monitoring

The fifth objective was to investigate how the COVID-19 pandemic risk was monitored in records and archives units, and the results were that 2 (9.1%) of the respondents stated that the records and archives management operations were not monitored to address abnormalities during the pandemic. Nineteen (43.2%) respondents stated that their department did not constantly monitor and evaluate environmental changes. Thirteen (29.5%) of the respondents indicated that designated individuals with appropriate skills were not identified for risk monitoring, while 27 (61.4%) stated that adequate resources were not available for risk monitoring. Most respondents 30 (68.2%) stated that assessments were not conducted to detect early warning signs of COVID-19's effect on records. The interview results indicated that monitoring the effects of COVID-19 on public records and archives was ineffective during the national lockdowns.

Discussion

The findings in the first objective show that the respondents, although a significant minority, mentioned information leakage. The most common channels for leaked information were:

WhatsApp, E-mail, Social media, and Phone. Similarly, Muchefa (2021), in the research conducted in the Zimbabwe Heritage sector, confirmed that official documents were leaked through phones or social media. According to "Seek Answers for Data Leaks" (2023), the database of India's COVID-19 digital vaccination booking service might have been compromised (leaked), as personal information could be accessed by entering the individual's phone number.

The interviews indicated delays in record creation and processing due to the downsizing of the staff. As a result, the government had to alter its record processing procedures. These findings are consistent with the research findings of Alyssa (2020) in Australia Public Agencies, highlighting that recording procedures were altered. Further, this study established that the records and archives were predominantly in physical format, with only 38.6% of respondents mentioning having a hybrid (Electronic and Manual) system. This result corroborates with Alyssa (2020), who reported that most information in Australian public agencies was in physical format.

In ascertaining the disruptions caused by the COVID-19 pandemic to records and archives operations in the second objective, the study found that changes were made in Records Office operations, with a backlog of work and work shifts while the archives were not accessible However, the Records Offices continued operations with a reduced workforce. Muchefa (2021) in his study in Zimbabwe also suggested a low level of visitors in all heritage institutions. While the Zimbabwe heritage institutions operated with fewer visitors, the Gambia National Archives was closed, he findings highlight the challenges faced by records and archives staff during the COVID-19 pandemic, including changes in staffing, modified work arrangements, health risks, and potential disruptions in file management and communication practices. These findings appear corroborated by MacDonnell's study (2021), which revealed that archivists were forced to work from home, hindering their effective performance. MacDonnell's study further revealed that archivists in the UK potentially risked their health by going to work in person whenever instructed.

The findings revealed that Action Officers used their personal email accounts for official communication. These findings corroborate Alyssa's report (2020) that employees of Australia Public Agencies used personal email accounts to communicate. the findings also revealed that the National Records Service of the Gambia did not issue a policy directive to tackle changes brought about by the COVID-19 pandemic. Contrary to this finding, the US National Archives and Records Administration instructed quick temporary solutions to manage records during the pandemic (Alyssa, 2020). Likewise, the UK, USA, New Zealand, Australia, and Canada's National Archives provided online updates on coronavirus and new operations in archives and records management (Kosciejew, 2021).

A finding that some electronic COVID-19 records and archives were managed by non-experts confirmed Gude and Asari's study in Indonesia in 2022 that non-experts managed COVID-19 archives. Furthermore, the findings revealed that operations were manual. Only a small proportion (38.6%) indicated using a hybrid system. For example, the Gambia's Ministry of Basic and Secondary Education used a hybrid (paper and electronic) system. The results corroborate Alyssa's report (2020), which indicated that many Australian public agencies did not operate in a cloud environment before COVID-19; only less than half of the respondents stated upgrading to cloud-based applications. Additionally, a significant number of respondents in the Gambia confirmed that letters that were created from home were sent to the Records Office for filing. On the contrary, in the UK, the National Archives did not support the removal of records from dedicated facilities for homework (Kosciejew, 2021).

Most respondents indicated that the lack of implementation of COVID-19 protocols was due to a lack of personal protective equipment (PPE). The interview findings also confirmed that the office was challenged to meet demands for protective gear. Similarly, Rocha et al. (2014) in a study on 221 workers from 22 gas stations in Brazil, showed that 12 workers did not use PPE because of lack of PPE, inaction, and discomfort. Though most workers used

PPE, some claimed the company did not provide or enforce it (Rocha et al., 2014). One of the interviewees perceived that the overall impact was mild and that the COVID-19 situation was handled satisfactorily. On the limited public access to archives highlighted in the study findings, Ramli et al. (2022), in their study in Malaysia also observed that research and memory institutions in Malaysia were closed, and researchers could not directly access the physical public archival materials but resorted to the online finding aid.

In identifying the response plan in place before the COVID-19 pandemic, the findings suggest that while a significant number of archives and records offices had policies in place to address disasters, none was effective for the challenges of COVID-19 records and archives. This finding supports Muchefa's (2021) argument that most heritage institutions had disaster and risk reduction strategies, which were useless during the pandemic. The findings mentioned several types of plans in place. This finding contradicts Alyssa's (2020) findings that there was a lack of disaster risk plans in Australia's public agencies. The results revealed that the National Disaster Management Office did not effectively address information disasters. This result corroborates MacDonnell's (2021) assertion that disaster plans do not adequately show ideal mitigation methods. Financial constraints, lack of necessary supplies, limited training opportunities, and a lack of management support and understanding were crucial factors hindering disaster risk plan implementation. MacDonnell (2021) further asserted that there was a lack of training programmes for disaster response and affirmed that archival disaster management generally does not provide specific information about training employees for pandemic situations and managing a scattered workforce.

An overwhelming majority of the respondents stated that no training was provided for managing a scattered workforce and uncertainty reigned on how to handle pandemic related records and archives in the public sector The results appeared confirmed by Alyssa (2020) that there were no policies and measures to manage the records. Muchefa (2021) confirmed gaps in handling records generated from such an abnormal working environment. Gude and Asari (2022) stated there was no policy regarding the creation and format of COVID-19 archives. MacDonnell (2021) affirmed that there was a lack of training programmes for disaster response. Asamoah, Akussah, and Musah (2018) also confirmed the findings, suggesting that public institutions in Ghana were highly unprepared to manage information disasters.

In the fourth objective, which was determining the disaster plan implementation used to contain the COVID-19 pandemic on records and archives, the findings confirmed that no disaster plan was employed. Again, most respondents agreed that the disaster risk plan was ineffective. Momoti and Marutha's (2021) findings in South Africa supported these results, which stated that some archives and records management institutions have preservation, access, and disaster preparedness measures, while others lack them. Furthermore, a large majority of respondents indicated that there was no adequate budget to mitigate the possible effects of COVID-19. These findings confirm those of Asamoah, Akussah, and Musah (2018) in Ghana, indicating that inadequate budgetary allocation for the records departments was identified as one of the factors leading to information disasters. Lack of preservation and access to archives were also cited as issues. The interview further suggested that handling incoming paper records was an issue because it was believed that the letters could be contaminated, exposing the records staff to risks. Similarly, research centres in Australia were closed, resulting in a lack of access to original records (Kosciejew, 2021), Whilst transferring paper records to the National Archives was suspended in the UK (Kosciejew, 2021). The findings also showed that the Advisory Committee could not meet regularly and was entirely unhelpful in providing advice during that period. These findings did not align with Kaur, Malik, and Sharma's (2021) suggestion in India that boards must conduct dynamic risk assessments, rethink traditional risk models, and embrace new developments to ensure agility and adaptability in the new normal post-COVID-19.

In the fifth objective, meant to investigate how the COVID-19 pandemic risk was monitored in records and archives units, the findings revealed some records created from home were not filed in the Records Office, and records and archives management were not monitored to address abnormalities. Further, the results disclosed that an

assessment was not conducted to detect early warning signs of COVID-19's effect on records, and adequate resources were not available for risk monitoring. The interview results agreed that monitoring was ineffective. These findings contradict the guidelines devised by Cooperative Governance and Traditional Affairs (2014) and the World Meteorological Organisation (2022) regarding its instruction that a systematic collection and analysis of quality data and information be conducted according to international standards to generate an early warning and improve the efficiency and effectiveness of risk monitoring based on set targets and activities.

Conclusion

This paper assessed the impact of the COVID-19 pandemic on public records and archives in The Gambia using the ISO 31000 version 2018 risk management framework. It found that the archives and records management field was impacted negatively during the pandemic as there were reports of information leakage through social media, phones, and emails as well as alterations and delays that occurred in record creation and processing. WhatsApp and email became the most popular platforms for official communication. Most of the records and archives were physical. As such, paper-records management proved challenging during the nationwide lockdowns. The study found that most offices lacked an emergency/risk plan for the records and archives, even though a recovery plan existed for electronic records management. The study found that during the pandemic, records generated from home were not adequately documented, early warning signs of COVID-19's impact on records were not detected, adequate resources were not available for risk monitoring, and assessment was not conducted to detect early warning signs and effect on records. The study concludes that the intervention efforts during the COVID-19 pandemic were more about protecting the staff from contracting the coronavirus and little about protecting the records and archival materials or ensuring business continuity for the information services.

Recommendations

Based on the findings of this study, this paper suggests that The Gambia government consider implementing the following recommendations to mitigate future pandemic disruptions on records and archives to ensure preservation and access to national documentary heritage as well as business continuity:

- **Risks to records and archives**- With the findings that the pandemic affected the standard recording procedures and archival services, the study recommends that the records management sector adopt a complete automation/ digitalisation of public information assets**,** implement proper recordkeeping procedures, provide adequate resources, restructure all Records Offices, and develop robust policies. The government should also provide support grants, response strategies, and safety materials during pandemics, and enforce health precautions to mitigate pandemic effects.
- **COVID-19 disruptions to records and archives operations** – On the findings that COVID-19's emergence had unprecedentedly altered the records and archives management standard procedures, the development of robust legal frameworks, policies, and regulations, that the NRS ensures email records are adequately maintained and preserved using official media, is recommended. The staff should also be equipped with professional skills and knowledge on electronic records management, disaster management, preservation, conservation methods, information technology gadgets and general management.
- **Emergency/ Disaster response planning** – On the findings that the records and archives management sector was unprepared for the pandemic and that most offices lacked the necessary policies and disaster risk plans; it is recommended that relevant stakeholders consult and collaborate to formulate a comprehensive risk plan for public records and archives management. A training programme should be devised to enhance disaster risk management skills among records and archives personnel, address gaps in disaster management, and prepare the workforce for managing pandemic effects.

- **Disaster Risk Plan Implementation –** With the findings that the records and archives units lacked the required disaster plans and policies and that the National Disaster Management Office was ineffective in addressing information disasters, it is suggested that the agency should consider public records and archives as national assets and address information disaster issues in national disaster policies and collaborate with other institutions. The study further suggests that the NRS should establish a disaster management team for records and archives, conduct systematic data collection and analysis, and improve risk monitoring to better prepare for pandemics like COVID-19. Disaster management tools and equipment should also be available.
- **Risk Monitoring –** As the study revealed ineffective monitoring of records and archives during the pandemic, this study recommends that the NRS collaborate with relevant stakeholders, including the library, museum, archaeology, broadcast media, and the University of The Gambia, to pull resources together to protect and preserve national documentary heritage. In addressing the issue of inappropriate disaster monitoring in the Gambia, disaster teams should be created at the NRS and ministry levels to handle disaster preparedness, mitigation, response, and recovery.

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Influence of Research Skills on Librarians' Research Productivity in Public Universities, North-West, Nigeria

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Abstract

Survey research was conducted to determine the influence of research skills on librarian's research productivity in public universities in North-West Nigeria. The population comprised 373 librarians working in 18 public universities in the zone. Stratified sampling technique was used to select a sample size of 193 from the population. Data was collected with a structured, validated questionnaire. The instrument was pretested among librarians at Tafawa Balewa University, Bauchi, North-East zone. Cronbach's alpha reliability was 0.809 for research productivity and 0.908 for research skills. A response rate of 93% was achieved and the data was analysed with Spearman correlation regression. Findings revealed that research productivity (mean 1.81) was low while research skills (mean of 3.06) was high. There was no significant influence of research skills on research productivity. Possibly, other factors than research skills influence the research productivity of librarians in public universities in North-West Nigeria, hence the study recommended the management of universities should motivate librarians towards improving research productivity by recognising and granting incentives to productive librarians.

Keywords: Librarians' Productivity, Research Skills, Universities, Nigeria

Introduction

Research productivity is one of the mandates that institutions of higher learning need to fulfil. The output of knowledge is measured based on its production and its desimination shown by the numbers of published articles. Scholars' research activity in Africa and around the globe is measured by the number of journal articles produced in peer-reviewed journals, books, monographs, co-authored books edited works amongs others. Furthermore, the other indicators include the number of technical reports and patent some academics produced during their research. Also, research findings published in varying formats serve as secondary data for researchers inputs in policy formulation and innovative solutions to improve the lives of citizens. As highlighted by Jalal (2020,) research productivity is an index that best characterises the submission of papers in conferences, publication of books and other scientific output in the context of higher education. Several studies have evaluated the research productivity of scholars using a quantitative measure that includes the number of books, journals, patents, and technical reports (Atanda and Olasupo, 2019; Simisaye, 2019; Mbachu and Unachukwu, 2022; Haruna, Gbem-Ogunleye, 2023).

Academic librarians are required to publish papers as part of the requirements for career growth

and sometimes access to research grants. Increasingly, funding bodies do a background check of applicants' research productivity as part of the criteria for grant eligibility and this had enabled prolific scholars to receive developmental interventions from host communities (Agarwal and Tu, 2022). The studies of Hollister and Jensen (2022) and Zhao, Pan and Hua (2021) reported the high research productivity among librarians, while Lund and Maurya (2021) observed that American librarians had more publications than India librarians. Low research productivity was reported among academics in Nigeria (Oyeyemi et al. 2022; Simisaye 2019; Adamu 2022 and Umar and Babalola (2021). Simisaye's (2019) survey revealed low research productivity among academics. The author observed that librarians predominantly publish journal articles and conference proceedings, but other formats of publishing were less emphasised**.** Similarly, Oyeyemi et al. (2022) reported low research productivity levels among academic staff of federal universities of Medicine and allied Health Science; and Fabunmi (2022) discovered a similar trend in private universities. Umar and Babalola's (2021) and Adamu (2022) reported low research productivity among librarians in public universities in the North East.

The implication of low research productivity includes career stagnation and lack of empirical data for policy formulation. Low research productivity may hinder librarians' ability to access research grants, contribute to local production of academic resources and limit their representation at international fora (Oyeyemi et al., 2022). This implies that if librarians do not participate in research to improve their productivity levels, they may not be invited to support policies affecting the profession in their country nor receive support for developmental projects. Low research productivity may be attributed to a lack of time for team research. Igiri et al. (2021) and Iqbal et al. (2018) identified heavy work schedules, commitment to family obligations, distrust, and fear of assigning proper authorship based on merit as reason for not being productive. However, a level of competence in research skills is required to execute and publish articles.

Research skill constitutes the competencies applied during execution of research project. They are referred to as information literacy skills and self-efficacy skills (Moradi, Zargham-Boroujeni and Soleymani, 2020). Librarians apply research skills to pursue educational goals during topic selection, literature search, arrangement of bibliography, its appraisal, and ethical conduct of research writing (Gyuris, 2018). The research skills required for research productivity include in this study: critical thinking, problem solving, communication, research design skills and data management skills. Borrego, Ardanuy and Urbano (2018) associated research skills of librarians with greater cognitive skills and literature review skills for producing quality research. Shajitha (2020) on the other hand is of the view that data management skills enable researchers to reduce incidences of misplaced data, corrupted files, and loss of essential data that delays retrieval time in project execution thus enhancing decision making during research.

Academic librarians are required to publish papers for several reasons, career progression, access to research grants, research visibility, to earn their institution's ranking, and earn royalties from intellectual product of research. Despite the importance of research publication to the career of librarians, low research productivity has been reported among them by various scholars (Fabunmi, 2022; Okeji, 2018; Simisaye and Popoola, 2019). Low research productivity is a major challenge that can lead to career stagnation for librarians (Adetayo et al., 2023). Research productivity may be hindered without the requisite skill sets. Academics confident of their research skills are likely to engage in research activities. Preliminary investigation by the researcher indicates that some librarians in public universities, North-West, Nigeria have been on the same cadre because of low research productivity. The literature on research productivity shows scarcity of studies of research productivity of librarians in North-West, Nigeria.

Objectives of the Study

The objective of the study is to find out the influence of research skills on research productivity of librarians in public universities, North-West, Nigeria. The specific objectives are to:

1. ascertain the level of research productivity of librarians in public universities, North-West, Nigeria.

2. determine the level of research skills of librarians in public universities, North-West, Nigeria.
3. find the influence of research skills on research productivity of librarians in public universities, North-West, Nigeria.
4. determine the influence of the indicators of research skills on research productivity of librarians in North-West, Nigeria.

Research Questions

The following questions are answered in the study by answering two research questions and two hypotheses below:

1. What is the level of research productivity of librarians in public universities in North-West, Nigeria?
2. What is the level of research skills of librarians in public universities in North-West, Nigeria?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

H01: Research skills have no significant influence on research productivity librarians in public universities in North-West, Nigeria.

H02: Research skills indicators have no significant influence on research productivity of librarians in public universities, research skills North-West, Nigeria.

Literature Review

The quest for academics to meet university regulations concerning number of publications for promotion has made research productivity an essential activity for tenure staff employed in institutions of higher learning. The ivory towers of knowledge use research to solve society's problems, produce literature for knowledge transfer and participate in scholarly debate with colleagues across the globe. As academic engage in research publications of scholars, they become more visible in the use of research products. Academic visibility received from research productivity has earned researchers' invitations to serve as policy formulators, peer reviewers or external examiners. Institutions of higher learning take premium on the productivity of their academics as a way of increasing their webometric ranking.

Research products are published in diverse formats and accessible to researchers through published works. The published works include books, journal articles, conference proceedings, and unpublished works such as oral presentations, posters, grants, community works and supervision of postgraduate students (Adetomiwa and Okwilagwe, 2018). In contrast, the quality and impact of research productivity apply more to bibliometrics studies that emphasise H-index and citation (Jabeen *et al.*, 2015). Abramo and D'Angelo (2017) defined research productivity as the number of published articles produced by scholars in research institutions, measured by the H-index, that is the number of publication as well as the citations authors receive from articles. Also, the researcher observed that some librarians in developing countries publish their research in publishing outlet that are not visible online, hence the use of citation and h-index reduces their productivity count. In this study research productivity is defined as the number of published scholarly works such as journals, books, patent, conference proceedings, monographs and co-authored textbooks produced by librarians in public universities in North-West, Nigeria within a period of three years. Although measuring the H-index and google citation of authors may be more appropriate.

Research productivity has been measured by tangible and intangible outcomes that include the various products produced from research. The tangible products include number of published textbooks, patents, journal articles, proceedings, and grants received for research purpose. The intangible outcomes refer to the contributions of academics to curriculum design, participation in community service, and the supervision of postgraduate students (Adetomiwa and Okwilagwe, 2018). Research productivity may be hindered without the requisite skill sets as certain level of competence is required to engage in research activities.

Research skills are the competencies required for the execution of a research project and is sometimes referred to in the literature as information literacy skills or meta-cognitive skills (Moradi,

Zargham-Boroujeni and Soleymani, 2020). According to Porozovs and Grosberga-Merca (2021), cognitive skills are applied for problem identification, drafting article titles, conceptualising construct, selecting research methodology, designing research instruments, and data analysis. Working with peers helps in the acquisition of skills like critical thinking and problem-solving. Some institutions of higher learning have incorporated research skills' development to build the research capacity of their scholars. Doctoral students are expected to be proficient in research skills' appplication to scholarly work hence the minimal support given by supervisors (Mydin et al.; 2021). A scholar with competences in research skills would spend less time on a task than one without such capabilities.

Previous studies have established the connections between research skills and research productivity of librarians. Okonedo (2015) surveyed librarians in public universities in Nigeria and found that high self-concept in terms of ones confidence to perform research correlated with research productivity, implying that the higher the research skills of librarians, the higher their research productivity. Similarly, Simisaye and Popoola (2019) administered 783 copies of questionnaire to academic staff working in a research institute with five percent being librarians. The findings indicated that research skills correlated with research productivity. Also, Igbokwe, Benson and Enem (2019) observed that librarians' research skills correlated with quality of research produced. The authors studied the determinants of quality research output by librarians in eight universities in the South-East, Nigeria. Copies of questionnaire designed were administered to109 librarians in eight universities. The result revealed that research skills correlated with quality of research output produced by librarians**.**

Another study by Crampsie, Neville and Henry (2020) analysed the skills and behaviour leading to librarians' research productivity. An on-line survey was administered to practising librarians in the United States and Canada. The result showed that librarians were more competent in literature search, reviews, and manuscript development than other skills. Their finding aligned with that of Borrego and Pinfield (2020) which revealed that librarians were competent in various research skills ranging from literature review, literature search, management of referencing tools and to a lesser degree skills in data analysis and writing skills used in interdisciplinary research with other scholars. Research skills are essential to research productivity. The study of Anderson et al. (2022) revealed an improvement in librarians' methodological skills and abilities to analyse data using appropriate statistical methods after attendance at a training program. Additional papers were published with the skills acquired leading to improved research productivity level.

Despite the importance of research skills in enhancing librarians research output, studies have shown that librarians lacked such skills. Bhardwaj's (2017) study investigated the research activities of library and information science professionals in India. The findings revealed that academic librarians lacked data analysis and data collection skills. Also, Tahsildar and Husani (2021) reported that academics had average research skills while writing, methodological and research productivity were at a low level. Also, Kozoka and Wema's (2020) analysed factors influencing research capacity developments in four higher education institutions in Tanzania using mixed method research design. Their findings revealed that training improved their research skills even though they still lacked grant writing skills. The lack of research skills among librarians was also reported by Lund **e**t al. (2021**)**. The finding of the study revealed that academic librarians faced challenges in engaging in collaborative research due to inadequate knowledge of research methodology**,** editorial and communication skills.

Methodology

The universities chosen for the study comprised both federal and state universities. The states are Kaduna, Kano, Katsina, Kebbi, Jigawa, Sokoto and Zamfara States. The survey research design was employed for this investigation. The study's population comprised 373 librarians working in 18 public universities in North-West, Nigeria (Administrative offices of the University libraries of the institutions 2022). A sample size of 193 was derived using Taro Yamane's formula.

N=N/1+N(e)2

Where:

n signifies the sample size

N signifies the population under study
e signifies margin of error
n=x/1+ x(0.05)2
n= 373/1+373(0.05)2
n=373/1+373(0.0025)
n=373/1+0.9325
n= 193.25 =193

Table 1: List of librarians in Federal and State University Libraries in North-West, Nigeria

S/N	Name of University	Age (year of establishment)	Population of Academic Librarians	Sample of Academic Librarians used
	Federal Universities			
1	Ahmadu Bello University, Zaria	1962	138	72
2	Bayero University, Kano	1964	56	29
3	Nigerian Defense Academy Kaduna	1964	9	4
4	Usman Danfodiyo University	1975	14	5
5	National Open University (Kaduna Center)	1983	5	5
6	Nigeria Police Academy Wudil	1988	8	6
7	Federal University, Dutsin-Ma, Katsina	2011	10	4
8	Federal University, Dutse, Jigawa	2011	10	5
9	Federal University, Birnin Kebbi	2013	8	7
10	Federal University, Gusau Zamfara	2013	11	2
	State Universities			
11	Aliko Dankote University of Science and Technology, Wudil	2001	12	6
12	Kaduna State University, Kaduna	2004	27	14
13	Kebbi State University of Science and Technology, Alero	2006	9	5
14	Umaru Musa Yar-Adua University	2006	17	9
15	Sokoto State University	2009	9	5
16	Yusuf Maitama University, Kano	2012	17	9
17	Sule lamido University, Kafin Hausa Jigawa	2013	8	4
18	Zamfara State University	2018	5	2
	Total		**373**	**193**

Sources: Administrative offices of the University libraries of the institutions (2022) Yamane formula for calculating Sample

Stratified sampling technique was used to select the respondents. The stratified sampling technique was chosen because the librarians were drawn from 10 Federal and 8 State universities. The number of librarians in each institution varies based on their year of establishment. For example, Ahmadu Bello University Zaria, Bayero University Kano, and Kaduna States University have existed for 15 years and above, compared to other newly established universities, this explains the small number of librarians in other institutions. Prior to administering the research instrument, a verified questionnaire was pre-tested at Tafawa Balewa University, Bauchi state, from another zone in Nigeria. (North East Zone) The Kaiser-Meyer-Olkin (KMO) result for research productivity was 7.44 while research skills indicators ranged from 0.600 - 0.809.

Data was collected by the researcher and three trained research assistants within three weeks in the first quarter of 2023 from February 11th to March 3rd. The training was to help minimise errors and improve the quality of data collected. Informed consent was obtained before administering the research instrument to willing librarians. The response rate of questionnaire was 93%. Descriptive statistics, simple count and Spearman Corelation and Regression Analysis were used to analyse the data.

Data Analysis, Results and Discussion of Findings

Table 2: Demographic Characteristics of Librarians

Demographic variable		Frequency (n)	Percent (%)
Gender	Male	129	71.3
	Female	51	28.3
	Total	180	100
Age (years)	below 40	68	37.8
	50-59	19	10.6
	60 and above	6	3.3
	Total	**180**	**100**
Highest qualification	MLIS	153	85
	Ph.D.	27	15.0
	Total	**180**	**100**
Designation	Assistant Librarian	36	20
	Librarian I	39	21.6
	Senior Librarian	40	22.2
	Principal Librarian	14	7.8
	Deputy Librarian	5	2.8
	University Librarian	1	0.6
	Total	**180**	**100**
Years of Experience	Below 10yrs	114	63.3
	11-20yrs	52	28.9
	21-30yrs	7	3.9
	30yrs and above	7	3.9
	Total	**180**	**100**

Table 2 shows the analysis of demographic characteristics of the respondents. The result of gender distribution indicates that 129 (71.3%) respondents were males while 51(28.3%) were females, meaning there were more male respondents. The distribution by age shows that 68 (37.8%) were below 40 years, 87 (48.3%) were within 40 to 49 years, and 6 (3.3%) were 60 years and above. Also, the majority 153 (85%) have master's degree while 28 (15) % have a PhD. This shows that librarians working in universities North-West, Nigeria had the minimum requirement as academic librarians. The librarians' designation is mostly Librarian II representing 45 (25%) followed by senior librarians 40 (22%). In terms of years of experience, 114 (63.3%) had been in service for less than 10years, 52 (28.9%) have spent 11-20 years in service, 7 (3.9%) were between 21-30 years while another 7(3.9%) have spent 30years and above in service.

Research Question 1: What is the level of research productivity of librarians in public universities in

Table 3: Level of Research Productivity of Librarians in Public Universities in North-West, Nigeria

Types of Publications	Very High Level (4)	High Level (3)	Low Level (2)	Very Low Level (1)	Mean	SD
Journals articles	70 (38.9%)	35 (19.4%)	52 (28.95)	23 (12.8%)	2.84	1.08
Conference Proceedings	27 (15%)	35 (19.4%)	42 (23.3%)	76 (42.2%)	2.07	1.10
Textbooks	14 (7.8%)	22 (12.2%)	38 (21.1%)	106 (58.9%)	1.69	0.97
Technical reports	16 (8.9%)	16 (8.9%)	39 (21.7%)	109 (60.6%)	1.66	0.97
Co-authored textbooks	19 (10.6%)	13 (7.2%)	29 (16.1%)	119 (66.1%)	1.62	1.01
Book chapters	8(4.4%)	22 (8.9%)	41 (22.8%)	109 (60.6%)	1.61	0.87
Monographs	10(5.5%)	19 (10.6%)	22 (12.2%)	129 (71.7%)	1.50	0.89
Scientific peer-reviewed bulletins	7(3.9%)	19 (10.6%)	28 (15.6%)	124 (68.9%)	1.49	0.84
Grand Mean					**1.81**	**0.97**

Table 3 shows the level of research productivity among university librarians in public universities North-West, Nigeria. The grand mean of 1.81 (SD=0.92) revealed a low-level research productivity of librarians in public universities North-West, Nigeria. However, the level of research productivity on journal publication was high (mean 2.84) while others were low, conference proceedings (mean 2.07) and scientific peer review (mean 1.49). The findings is in accordance with the work of Okeji (2018) which reported low research productivity among librarians working in university libraries in Nigeria. Low research productivity among North West, Nigeria academic could be attributed to librarians low research motivation (Ogunode, ThankGod and Ayoke 2023). Thus, situating a university where researchers and citizens are unethusiastic on research may have a negative influences research productivity of librarians in North-West, Nigeria. Finding further showed that journal publication was the most preferred form of research publishing implying that librarians working in public universities in North-West zone preferred this channel of disseminating research output to others. This is perhaps due to the high rating accorded journal articles for promotion purpose in institutions of higher learning.

Research Question 2: What is the level of research skills of librarians in public universities in North-West, Nigeria?

Table 4: Level of Research Skills of Librarians in Public Universities in North-West, Nigeria

Research Skills of Librarians	Very High (4)	High (3)	Low (2)	VL (1)	Mean	Std.
Research design skills					**3.22**	**0.66**
My ability to administer the research instrument for data collection is …	68 (37.8%)	99 (55 %)	11 (6.1%)	2 (1.1%)	3.29	0.63
My ability analyze main ideas of a scientific article is …	67 (37.2%)	98 (53.3%)	16 (8.9%)	1 (0.6%)	3.27	0.64
My ability to select appropriate data collection instrument is	62 (34.4%)	99 (55%)	17 (9.54%)	2 (1.1%)	3.23	0.66
My ability to determine sample size is …	52 (28.9%)	110 (61.1%)	15 (8.3%)	3 (1.7%)	3.17	0.64
My ability to use the appropriate method for data analysis is …	61 (33.9%)	89 49.4(%)	26 (14.4%)	4 (2.2%)	3.15	0.74
Critical thinking skills					**3.09**	**0.68**
My ability to reflect as I read a scientific article is …	61 (33.9%)	99 (55%)	13 (7.2%)	7 (3.9%)	3.19	0.73
My ability to analyze main ideas of a scientific article is	51 (28.3%)	107 (59.4%)	19 (10.6%)	3 (1.7%)	3.14	0.66
My ability to develop a focused and systematic way of thinking is …	48 (26.7%)	110 (61.1%)	18 (10%)	4 (2.2%)	3.12	0.67
My ability to Interpret data and graphics is …	41 (22.8%)	109 (60.6%)	26 (14.2%)	4 (2.2%)	3.04	0.68
My ability to logically draw conclusions from the research outcome is …	33 (18.3%)	114 63.3(%)	28 (15.6%)	5 (2.8%)	2.97	0.67
Communication Skills					**3.09**	**0.67**
My ability to prepare research abstract is …	77 (42.8%)	85 (47.2%)	16 (8.9%)	2 1.1(%)	3.32	0.69
My ability to use reference according to rules of scientific writing in paraphrasing text is…	72 (40%)	92 (51.1%)	16 (8.9%)	0 (0%)	3.3	0.63
My ability to write manuscript that is logical and readable is …	43 (23.9%)	114 (63.3%)	22 (12.2%)	1 (0.6%)	3.11	0.61
My ability to present orally the result of a review of scientific literature is …	40 (22.2%)	99 (55%)	33 (18.3%)	7 (3.9%)	2.96	0.70
My ability to prepare manuscript for publication free of grammatical errors is …	26 (14.2%)	112 (62.2%)	34 (18.9%)	8 (4.4%)	2.87	0.75
Problem solving Skills					**3.05**	**0.69**
My ability to approach complex issues in a variety of ways is …	45 (25%)	115 (63.9%)	13 (7.2%)	7 (3.9%)	3.10	0.68
My ability to Suggest areas for further studies is …	48 (26.7%)	103 (57.2%)	22 (12.2%)	7 (3.9%)	3.07	0.73
My ability to select the best solution from several options in investigative studies is …	38 (21.1%)	118 (65.6%)	19 (10.6%)	5 (2.8%)	3.05	0. 65
My ability to make persistent effort to solve research questions and not be discouraged is …	41 (22.8%)	106 (58.9%)	28 (15.6%)	5 (2.8%)	3.02	0.70
My ability to apply result of research findings to phenomena being studied is …	41 (22.8%)	104 (57.8%)	30 (16.7%)	5 (2.8%)	3.01	0.71

Data management skills					**2.84**	**0.730**
My ability to back up my research data regularly to prevent data loss is …	51 (28.3%)	92 (51.1%)	30 (16.7%)	7 (3.9%)	3.04	0.779
My ability to arrange retrieved electronic resources systematically for ease of retrieval is …	40 (%)	101 (56.1%)	35 (19.4%)	4 (2.2%)	2.98	0.713
My ability to create a data management plan for collaborative research is …	40 (22.2%)	95 (52.8%)	40 (22.2%)	5 (2.8%)	2.94	0.745
My ability to use a standardized, naming convention for stored files is …	21 (11.7%)	98 (54.4%)	54 (30%)	7 (3.9%)	2.74	0.712
My ability to use a codebook in documenting research process is …	21 (11.7%)	88 (48.9%)	64 (35.6%)	7 (3.9%)	2.68	0.728
My ability to clean data, transform outliers and missed data for data analysis is …	18 (10%)	92 (51.1%)	63 (35%)	7 (3.9%)	2.67	0.708
Grand mean					**3.06**	**0.69**

North-West, Nigeria?

Table 4 shows the level of level of research skills among public university librarians in North-West, Nigeria. The grand mean 3.06 (SD=0.69) indicates that librarian's research skills are high. The result further reveals that research skills indicators of librarians in terms of research design skills (mean 3.22) is high, critical thinking skills mean (3.09) is high, communication skills mean 3.09 problem solving skills mean 3.05 and the other indicators are all high as displayed on the table. The result indicates the level of librarian's research skills in public universities North-West Nigeria is high. The result aligns with Pinfield (2020) who found that librarians possessed high competencies in some research skills but disagrees with Bhardwaj (2017) who reported low research skills among Indian librarians.

Analysis and Presentation of Research Hypotheses

The hypotheses formulated for this study were tested using Spearman Correlation and Regression Methods at 0.05 level of significance as presented in Table 5.

Hypothesis 1a: Research skills have no significant influence on librarian's research productivity in universities in North-West Nigeria public universities.

Table 5: Influence of Research Skills on Research Productivity

			Research Productivity	Research Skills
Spearman's rho	Research Productivity	Correlation Coefficient	1.000	.033
		Sig. (2-tailed)	.	.663
	Research Skills	Correlation Coefficient	.033	1.000
		Sig. (2-tailed)	.663	.

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows the Spearman correlation coefficient (rho= 0.033) of research skills has a positive relationship on research productivity, this influence is not significant at 5% level on librarians' research productivity in public universities in North-West. The null hypothesis is therefore accepted as research skills have no significant influence on librarians' research productivity in public universities, North-West, Nigeria. The findings disagreed with those of Igbokwe, Benson and Enem (2019) and Neville, Henry (2020) and Crampsie Neville and Henry (2020). The finding that high research skills of the librarians in North-east Nigeria did not translate to high research productivity may be attributed to the excess workload. The self-report nature of this study, in which librarians report their skills, may also be responsible for the result observed as respondents may have rated their research skills highly. Furthermore, librarians in public universities North-West, Nigeria, may not be motivated to conduct research; perhaps they could be more productive if they collaborate with other researchers.

Hypothesis 1b: Research skills indicators have no significant influence on Librarian's research productivity in public universities in North-West, Nigeria's public universities.

Table 6: Influence of Research Skills indicators on Research Productivity

			Research Productivity	Critical thinking skills	Problem solving skills	Communication skills	Data management Skills	Research design skills
Spearman's rho	Research Productivity	Correlation Coefficient	1.000	-.007	-.122	.050	.151*	.015
		Sig. (2-tailed)	.	.931	.102	.504	.042	.841
	Critical thinking skills	Correlation Coefficient	-.007	1.000	.530**	.548**	.481**	.639**
		Sig. (2-tailed)	.931	.	.000	.000	.000	.000
	Problem solving skills	Correlation Coefficient	-.122	.530**	1.000	.363**	.319**	.473**
		Sig. (2-tailed)	.102	.000	.	.000	.000	.000
	Communication skills	Correlation Coefficient	.050	.548**	.363**	1.000	.478**	.553**
		Sig. (2-tailed)	.504	.000	.000	.	.000	.000
	Data management Skills	Correlation Coefficient	.151*	.481**	.319**	.478**	1.000	.434**
		Sig. (2-tailed)	.042	.000	.000	.000	.	.000
	Research design skills	Correlation Coefficient	.015	.639**	.473**	.553**	.434**	1.000
		Sig. (2-tailed)	.841	.000	.000	.000	.000	.

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6 presents the results of the Spearman correlation analysis of research skills indicators on research productivity. The Spearman correlation coefficient critical thinking skills (rho= -.007) and problem-solving skills (rho= -.122) have a negative relationship on research productivity, there was also a positive relationship of communication skills (rho= .050) and research design skills (rho= 0.15) on research productivity of librarians in public universities, North-West, Nigeria. The influence is not significant on librarians' research productivity in public universities in North-West, Nigeria at 0.05 level of significant. Consequently, the null hypothesis is not rejected. The study connotes that critical thinking, problem-solving, communication, and research design are not predictors of research productivity of librarians in public universities in North-West, Nigeria. On the contrary, there is no significant influence of research data management skills (rho= .151) on librarians' research productivity in public universities in North-West, Nigeria at 0.05 level of significance, thus it is only data management skills indicator that predicts Librarian's research productivity of librarians in public universities, North-West, Nigeria.

Implications of the Findings

The study investigated the influence of research skills on librarian's research productivity in public universities in North-West Nigeria. However, findings of the study revealed that research skills of librarians despite being high, did not translate to improving librarians research productivity by the low level of research output published. The finding that the high research skills of librarians did not translate to high research productivity may be attributed to the non-teaching role of academic librarians and excess workload as revealed in the study. The self-report, a significant nature of this study in which librarians relied on their skills, may also be responsible for the observed result as most respondents may not want to rate their research skills as low. Furthermore, librarians in public universities in North-West Nigeria may not be motivated to conduct research alone. They may perform better by collaborating with other researchers. This implies that librarians working in public universities, North-West Nigeria are not motivated to improve their productivity levels, hence they may continue to experience career stagnation, invisibility, dependence on others for teaching resources and inaccessibility to grants. There is urgent need for educational stakeholders and researchers to find other means of improving librarians research productivity. Establishing library schools in public universities North-West, Nigeria would enable academic librarians working in university libraries to transfer their services as teaching staff. The supervisory role to students thus allows librarians to collaborate with supervisees to research and publish additional papers.

Conclusion

The study set out to investigate the research skills on research productivity of librarians in public universities, North-West, Nigeria. Research productivity helps early career researchers and librarians to establish their career path with other benefits such as visibility, earning royalties, and recognition in their disciplinary domain. Although librarians have high research skills, their research productivity levels remain low. High research skills were identified in design of research instrument, writing abstract and literature review. The increase in research skills did not influence research productivity as expected except research data management skills indicator. The study concludes that research skills did not contribute to Librarian's research productivity in public university libraries in North-West, Nigeria.

Recommendations

The following recommendations are made based on the result of the findings:

1. Management of public universities, North-West, Nigeria should motivate librarians towards improving their research productivity through recognition and granting incentives to productive librarians. Incentives that include payment of publishing fees and recognition of productive librarians could improve research productivity.
2. Librarians working in public universities, North-West, Nigeria, should embrace other channels of sharing knowledge such as textbooks, technical reports, co-authored textbooks,

monographs, and scientific peer reviews bulletins instead of journals only.

3. Management of public universities should organise practical training programmes in publishing of research output through online platforms. This may motivate librarians to be more productive by disseminate research findings for improve service delivery.

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Managing Human Resource Records for Accountability at Garissa County Government, Kenya

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Abstract

Accountability within management of human resource records is to a large extent, reliant on the availability of human resource records. Human resource records management issues have been addressed in a number of ways, including the creation of a policy and a complex manner of file tracking system. However, despite these efforts, keeping human resource records remains a concern. The aim of this research was to establish whether management of human resource records in Garissa County Government (GCG supports accountability. The study objective was to determine the need for the management of human resource records to accountability in Garissa County Government (GCG). The study was informed by the records continuum theory. The target population comprised 88 respondents from human resource departments and offices of Garissa County Government. The study adopted census survey since the target population was small. Descriptive surveys and structured questionnaire were used to obtain the data. The study's findings showed that human resource records support accountability and good governance as this enables GCG to fulfill its mandate that is good governance and accountability. The study recommends proper management of human resource records to improve accountability in Kenyan private enterprises.

Keywords: Human Resource Records, Accountability, Kenya.

Introduction

Records management, according to Saffady (2021), is dealing with the methodical examination, as well as information control stored, which encompasses any information generated, acquired, maintained, or utilised by an organisation in the course of its operations and activities. Records that are maintained, structured, and closely watched by management will enable efficient and effective updates to organisations, according to Mojapelo and Ngoepe (2021).

However, a number of institutional obstacles prevents the necessary adoption of cutting-edge, information-centric solutions to revolutionise records administration. According to Mosweu and Rakemane (2020), the keeping of records for human resources is a requirement for the development of good governance.

A mechanism for providing documented proof on which governments may be held accountable is the management of human resource records. To avoid being held liable for any misleading claims, it is crucial that government institutions remain transparent. According to Lowry and Wamukoya (2016), records are a significant source of information, almost the only trustworthy as well as lawfully verifiable source of data that may be utilised to support public-sector decisions, actions, and transactions. Records support knowledge management, accountability, better governance, policymaking, the development and execution of successful services and programmes as well as the safeguarding of human rights and liberties.

The International Standards Organisation (ISO) ISO 15489 (2016), a records management standard, in 2016 after identifying the necessity for the administration of human resource data stated that management of records across all media and formats is governed by this standard. It offers the ideas and guidelines that provide the foundation for advocating acceptable standards for managing records, including metadata for records and metadata for records systems (ISO 15489, 2016).

By establishing and safeguarding human resource records as trustworthy evidence, other important goals of human resource records management include supporting corporate responsibility and facilitating accurate audits. Human resource records may affect a person's ability to work, social status, career opportunities, training eligibility as well as access to benefits, such as pensions, insurance, and medical contribution systems, according to Roper and Millar (1999).

Human resource records, which comprise deaths and births records, enrollment records, including those pertaining to social security and pensions, are crucial for an individual's safeguarding, based on the World Bank (2009). Similar to other administrative records, the government utilises these documents to show its human that it is accountable. In the 1940s, nations including the United States and the United Kingdom (UK) launched records management programmes to address problems like a lack of regulations and laws, decluttering, a shortage of competent human resources, and inadequate protection and preservation of public documents. They think that effective record management can lead to such progress

Records and archives assist the activities of human, and both public and private agencies. Ngoepe and Ngulube (2013) noted that senior management in the public and private sectors do not see administration of human resource records as a critical part of any successful company, despite the fact that many public offices take steps for excellent records management.

OUT (2011) noted that the responsibility of managing a list of human resources and protecting the evidence of governmental operations are not often well understood. A county's human resources are among its most valuable and sometimes most expensive assets; since they are valuable, they must be used to their fullest potential. By ensuring that information is accessible for accountability and to preserve both state and individual rights, management of human resource records may significantly contribute to a county's accountability. Payroll systems and human resource management systems are intertwined, therefore improvements to human resource records will have a favorable influence on the county's entire budget. In many nations, including Kenya, managing human resource data has proven difficult. For example, in Kenya, the State Department of Public Administration (MSPS) has over time developed a number of technology efforts to help it carry out its duty. The creation of the Integrated Payroll and Human resource Database (IPPD) to aid in human resource management was a significant one of these.

In spite all the efforts Kenya has made, county governments still suffer as a result of poor maintenance of various human resource documents, including fragmented and unprocessed records for human resources, poor storage facilities, inadequate staff and human resource records such as payroll, pensions, national insurance systems not considered important, yet, they are very vital to government's operations. The administration of records has become increasingly worse in underdeveloped nations over time.

It has been a long-standing goal of Kenya to achieve the so-called "ugatuzi" devolved system of government. The "dream" form of government (now known as "County Governments") was made a reality with the publication of Kenya's 2010 Constitution (CoK 2010) on August 27, 2010. The establishment of county governments is particularly addressed in Devolved Government is covered in CoK 2010's Chapter Eleven (Cap 11)., with Garissa serving as one of them. The different elements of devolved or county administration, including democratic values and the separation of powers, are spelled out in Cap. 11 of CoK 2010. In order to successfully rule and provide services, county governments will be provided with solid sources of funding, while not over two-thirds of every county's elected officials representative bodies may belong to the same gender.

The current county government's administrative headquarters is in Garissa town, and it is made up of the county assembly and county executives, who have the authority to pass laws and carry them out through the executive branch. Garissa County, like other counties, was established in accordance with the 2011 Urban Areas and Cities Act (which abolished Local Government Act Chapter 265 and handed power of Cities and Municipalities to county governments), the Intergovernmental Relations Act of 2012 (which shifted control of Municipal corporations to county governments), (which regulated intergovernmental relations), the County Government Act of 2012 and Transformation to County Governments Act of 2012).Garissa County Government uses human resource records to do its daily transactions and operations. Paper-based records are popular in the county government with a limited number of electronic records. The county government has eleven (11) departments whose records are managed by Human Resource Management Officers (HRRMOs) Human Resource Record Management Assistants (HRRMAs), Human Resource Record Management Clerks (HRRMCs), and personnel from the registry. The documents are maintained and stored in the central registry while others are maintained in their respective departments. The survey's main goal was to find out whether management of human resource records supports accountability in Garissa County Government.

Statement of the Problem

In spite of the important role of human resource records in society, there are no national policies and legal framework on the keeping of records for human resources and retention schedules in some countries. The maintenance of human resource records and the requirement for them for accountability do not have complete policy and legal frameworks. According to ISO (2016), to support accountability, counties must establish and maintain, reliable, and utilisable human resource records, and safeguard those records' integrity for as long as considered necessary. This holds true for both paper-based and electronic documents. Human resource records must be preserved for a considerable amount of time, frequently after a worker has left the company to safeguard the liberties and desires of those who remain of both the employer as well as the employee. Human resource records containing information about specific persons are particularly important, as they must be properly protected against unauthorised access, since they are sensitive and confidential (State of New South Wales, 2003).; The ROK-MOH, 2016). Even though there have been several attempts to solve the issues with keeping human resource data, such as the development of a guideline for handling these records and a sophisticated technique of file tracking, the difficulties with doing this persist. It is upon this background that this study sought to determine the need for the management of human resource records in promoting accountability at Garissa County Government.

Objectives of the Study

This study's main objectives of this study were to find out the need for human resource records management at GCG, as well as to explore the attitudes and behaviours of GCG workers about the County's role of managing its human resource data.

Literature Review

Human resource records management in Kenya starts with the Ministry of State for Public Service (MSPS), which is in charge of overseeing organisational structures and human resources in the Public Service. Over time, the Ministry has implemented a number of technical efforts to help it

carry out its duty. The creation of the Integrated Payroll and Human Resource Database (IPPD) to aid in HR administration was a significant one of these. The IPPD was primarily created to manage the civil service's payroll, which at the time was plagued by duplications and other inefficiencies brought on by manual payroll administration.

By significantly enhancing payroll administration, IPPD was able to reduce duplication in the records of human resources to some extent. Given the foregoing, MSPS started work on designing and creating a GHRIS (The Government Human Resource Information System) that meets all of the government's HR-related demands. Other systems already in place including IFMIS (Integrated Financial Management Information System), G-PAY (Google Pay) , and IPPD are anticipated to connect with this system. Both HR practitioners in MDAs (Ministries Departments and Agencies) and individual workers may access the GHRIS to examine and amend their human resource data. The system will also be used by the following organisations for a variety of decision-making tasks: Recruitment and selection are handled by the Public Service Commission; financing for human resources is handled by the Ministry of Finance; and management, development, and monitoring of human resources are handled by the Ministry of State for Public Service. To access the system's many features, each user will be given a unique set of rights and privileges. (MSPS, 2011).

Makwae and Nyarige (2017) citing Akporhonor and Iwhiwhu, (2007) notes that human resource records also called employee files might be described as "record that contain initial application forms, results of physical examination, interviewers' notations, test scores, periodical appraisals, transfer and promotions, disciplinary actions, releases and retiring wages, salaries, taxes paid, contributions and similar items". Additionally, they claim that a worker's file may also contain part or all of the following data: complete name, address, phone number, age, sex, nationality, ethnic origin, religion, union membership, and so forth. The State of New South Wales (2003) lists the following as examples of frequently used human resource records: Each employee's human resource records, sometimes referred to as personal or employee records (organised by name or position number) non-employee-specific human resource records, such as procedure or policy records, that are arranged by activity or subject. Database systems with certain human resource components were incorporated into human resource database systems, either as generic packages or specifically created for the organisation.

Modern thinking on development strategy places a premium on better human resource management. One of the things preventing Sub-Saharan Africa from seeing sustained economic growth is inadequate governmental administration, according to a World Bank report from 1989 that Cain and Thurston (1997) mention. The study demanded improved management of human resource records, including staff testing, competitive entrance examinations, frequent assessments, merit-based promotions, selected pay structure improvements, and accurate human resource records (Cain and Thurston, 1997). County governments benefit from accurate human resource data by improving the effectiveness of hiring, training, and promotion. Additionally, they can offer the raw data needed to track concerns with equal opportunity and the legal obligations imposed on all county governments. A county government can identify any chances for skill improvement to meet criteria by managing records of individual skills and competencies. Because human resource records deal with human, the accuracy and security of the records is in everybody's best interests. This information will help to improve working connections. The information that is retained and why it will be known by employees and their representatives. It must advocate for equitable and consistent treatment.

According to IRMT (2000) human resource records are made and utilised every day in government to transmit information, validate decisions, establish rights and duties, and document activities. County governments and corporations simply could not function without human resource records. County governments use human resource records for a variety of reasons, including: providing information on earlier acts or choices, validating employee work, pensions, leave, and health benefits, examining or verifying rules and processes, and verifying citizens' rights, such as benefits or property ownership. Although the majority of human resource records do not need to be retained indefinitely, a small but important number need. These records of a

county government's human resources are those that are kept in public archives. Members of the public, academic and professional researchers from a broad range of disciplines, journalists, donor and lending institutions, others desiring to interact with their country's original cultural and traditional origins, and anybody who has a problem that can be resolved by consulting records are typical archival clients in national and other organisations (IRMT, 2000).

Research Methodology

Social survey research was used in this study because it was necessary to comprehensively analyse the need for human resource records management at GCG, as well as the attitudes, behaviours, and experiences of GCG workers. A questionnaire was created and given to sampled respondents inside GCG, The study targeted 88 participants. Garissa County Government is in the former North Eastern Province of Kenya. Its capital town is in Garissa. The study focused on Garissa County Government which is one of the 47 county governments in Kenya. The county government of Garissa was chosen since time and resources allocated for the study would make it impossible to travel across the 47 counties.

The institution's registration system consists of the Central registry and the secret registry. Garissa County Government has eleven departments, each with its own sub-registry, such as the human resource department and the treasury, which compiles and maintains current county financial records. The County central registry's main records are land records, which are structured in blocks that form a map of the entire County. The executive arm of the County government staff's personnel files is created and maintained by the human resource department registry. The strategic plans for the Garissa County Government estimates that there are around 3,200 personnel files. In general, all of the county's records are a wonderful source of information for everyday operations and considerably assist in decision-making.

The population under investigation included 88 respondents, who were distributed in the staff registry and departments. Since the study's intended audience was rather small, a census survey was used.

Table 1.: Target Population

Respondent	Target Population
Human resource Management Officers (HRMOs)	11
Human resource record Management Assistant (HRRMAs)	11
Human resource records management Clerks (HRRMCs)	11
Registry Staff	55
TOTAL	**88**

Source: Researcher (2022)

Results

Need for Human Resource Records Management at GCG

Garissa County Government maintains its human resource records for the purposes of accountability and good governance as this enables it to fulfill its mandate, that is good governance and accountability. Not all the respondents completed the questionnaire, as 73 respondents completed the questionnaire. Most of the respondents 57 (78%) of the respondents revealed that human resource records management is not considered as important, meaning the top management does not support it financially, while 16 (22%) agreed that human resource records management is considered important, implying that it is supported by top management. The results also revealed that as much as the GCG does not regard human resource records as one of the important resources, the county cannot function without them, as 100 % of the respondents revealed that the county valued and relied on human resource records for its operations.

The following Garissa County government agencies and departments that deal with human resources made up the study's sample population, as revealed in Table 1.

Garissa County Government's human resource records enabled it to perform its operations such as: providing reliable details regarding the decisions and acts of its employees and to show that the government officials behaved properly and this will lead to accountability and good governance, as well as achieving its goals. When a person is hired by the County, an employees' records file is created bearing crucial information about them, thus it is important to put them properly in the correct file. Garissa County government has 11 distinct departments. The county registry is tasked with creating a human resources file for each and every employee in order to efficiently manage all the County Government employees. Much of the information relevant to a county employee is held in human resource files.

All the County human resource records are stored in both a central and confidential registry. According to the Register Department of the Garissa County government's (2018) data, the county has a total of three thousand two hundred (3200) human resource records. The registration system is mostly manual because most records were kept on paper. The county generates and maintains human resource data to assists managers in gathering critical information about their employees, maintains an up-to-date record of leaves and transfers, and assists the county in the creation of various training and development programs. Human resource records also provide statistics on turnover rates, absenteeism, and other human resource issues, assist county administrators in making pay modifications, allowances, and other salary-related perks and serve as a dependable source of information for scholars doing human resource.

The Importance of Human Resource Records as one of the Important Resource to GCG

The study sought to ascertain why human resource

Table 2: Reasons for Regarding Human Resource Records as one of the Important Resource to GCG

Response	Frequency	Percentage
Efficient and orderly flow of information	73	100
County memory provides a point of reference	73	100
Formulating policies, future plans	73	100
Making informed decisions	73	100
County cannot function without human resource records	73	100
Fast tracking service delivery due to readily available information	73	100
Accurate and up to date information ensures accountability to the public	73	100
Total	**73**	**100**

records are thought to be one of the crucial resources that would allow GCG to be responsible in working out its mandate successfully. The results are shown in Table 2.

The findings in Table 2 above revealed that all the respondents regarded human resource records as one of the important resources, as shown in the Table. GCG, as a county, cannot function without human resource records, and, that is why none of the respondents indicated otherwise, as they unanimously agreed that the county valued and relied on human resource records for its operations. This means that the GCG cannot do without human resource records.

Discussions

The study found that every county government employs personnel and maintains human resource records, and that the aim of managing these data is to accomplish county government goals and objectives. As a result, it was determined that the core of the county government's management mandate to guarantee that human resource records are managed is adhered to, since they are crucial to the county government's accountability and good governance is, the concept management of human resource records in support of accountability in devolved governments.

The study found that, to a great extent, the county government keeps track of human resource data because it is essential to good governance, accountability, and the health of the county government in terms of effectiveness and efficiency of the county governments' accountability, which will improve the county government's ability to compete in the provision of services. The findings signify the importance of managing human resource records to accountability in devolved governments, since human resources are the county governments' most valuable resource and this will enhance accountability in the county government leading to good governance and delivery of services that meets the client's expectation.

The Garissa County Government is able to perform its duties thanks to its human resource records, which include providing trustworthy information about the decisions and actions of its employees and demonstrating that the public servants have acted appropriately, encouraging accountability and good governance and enabling the achievement of the county governments' goals. According to Cain and Thurston (1997), modern development policy thought revolves around enhanced humans resource records management. Accurate management of human resource records helps county governments in increasing the efficiency of recruitment, training and development, and promotion. They also provide the raw data to monitor equal opportunities issues and the legal requirements placed on all county governments.

Because human resource records deal with human, it is in everyone's best interest for the records to be accurate and secure. Understanding this will help to improve workplace relationships and accountability. Systems for managing human resource records have strong connections to other government systems, particularly those that deal with budget, payroll, and pension administration. The proof and permission to pay salary and benefits to employees are found in human resource records. Therefore, there is need to have accurate and reliable human resource records to provide information for accountability issues. From above the study found that, management of human resource records has a positive significant to the county government's accountability.

Three thousand two hundred human resource records are present in the county, according to figures from 2018 held by the register department GCG. This has to do with the overall personnel count for the county government. The registration system is primarily run manually because the majority of records are on paper. According to the respondents, the county keeps and generates records of its human resources for the following reasons: It aids in providing management with important information on the employees, Keep a current record of transfers and departures, among other things. aids in the creation of different training and development programmes for the county, the county is able to collect information on employee turnover, absenteeism, and other human resource-related issues. It offers a trustworthy source of data for the researchers looking into human resource records and aids county administrators in making wage modifications, allowances, and other advantages associated to salaries

Garissa County Government maintains its human resource records for the purposes of accountability and good governance as this enables it to fulfill its mandate that is good governance and accountability. 78% of the respondents revealed that human resource records management is not considered important, meaning the top management does not support it financially, while 22% agreed that human resource records management is considered important implying supported by top management.

The results also revealed that as much as the GCG do not regard human resource records as one of the important resources 100 %, the county cannot function without them as all the respondents revealed that the county value and rely on human resource records for its operations. Garissa County Government's human resource records enable it to perform its operations such as: providing reliable information about decisions and actions of its employees and to demonstrate that the public servants have acted appropriately and this will lead to accountability and good governance as well as achieving its goals. The study found that every county government in the globe employs personnel and maintains human resource records, and that the aim of managing these data is to accomplish county government goals and objectives. As a result, it was determined that the core of the county government's management mandate to ensure the management of human resource records is adhered to, since they are crucial to the county government's accountability and good governance is the concept management of human resource records in support of accountability in devolved governments.

The study revealed that to the greater extent, there is management of human resource records that is part and parcel of the county government, since human resource records contribute to good governance and accountability the wellbeing of the county government in terms of effective and efficiency of the county governments' accountability that will enhance the county government to maintain and to competitive service delivery. The findings signify the importance of managing human resource records to accountability in devolved governments, since human resources are the county governments' most valuable resource, and this will enhance accountability in the county government leading to good governance and delivery of services that meets the client's expectation.

Garissa County Government human resource records enable it to perform its operations such as: providing reliable information about decisions and actions of its employees and to demonstrate that the public servants have acted appropriately and this will lead to accountability and good governance as well as achieving of the county governments' goals. Cain and Thurston (1997) opined that improved human resource records management is central to current development policy thinking. Accurate management of human resource records helps county governments in increasing the efficiency of recruitment, training and development, and promotion. They also provide the raw data to monitor equal opportunities issues and the legal requirements placed on all county governments.

Because human resource records deal with human, it is in everyone's best interest for the records to be accurate and secure. Understanding this will help to improve workplace relationships and accountability. Systems for managing human resource records have strong connections to other government systems, particularly those that deal with budget, payroll, and pension administration. The proof and permission to pay salary and benefits to employees are found in human resource records. Therefore, there is need to have accurate and reliable human resource records to provide information for accountability issues. To guarantee that records of human resources are recorded, kept up to date, and made available as needed for accountability and good governance, mechanisms should be put in place.

Conclusion

The respondents regarded human resource records as important and crucial to the to the roles GCG workers are expected to perform. To support government operations, to give trustworthy information on the choices and activities of public employees, and to show that the employees have acted correctly, human resource records are required. Based on the administration of human resource data, county governments function in very similar ways. These procedures are essential for any county

government that is focused on achieving its goals, because they will promote accountability and good governance via the proper handling of personnel files.

Recommendations

The study recommends that staff's training and development committee of GCG should conduct numerous trainings for the staff through workshops and seminars. In-house and on-job training will be the best method to inculcate the desired record management skills among county human resource management officers, as such programmess will be rolled at work place, hence the staff will stand a chance of enjoying concrete experiences. The study further recommends that for the county governments to be accountable, there is need for human resource records to: verify employee job documentation, pensions, vacation, and health benefits. The CCGs should provide information on previous acts or decisions, reaffirm policies and processes, and confirm human' rights, such as benefits or property ownership. All this will be achieved through recognising the role or uses of human resource records in achieving its objectives.

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Legal Factors as Precursors of Consortium Building Readiness among University Libraries in South-West, Nigeria

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Abstract

The study investigated legal factors as precursors of consortium building readiness among university libraries in South-West Nigeria. In line with this, two research questions were posed: what are the prevailing legal factors for consortium building readiness among university libraries in South-West Nigeria? What is the level of consortium building readiness among university libraries in South-West Nigeria? These were the research questions, and one hypothesis: there is no significant relationship between legal factors and consortium building readiness among university libraries in South-West Nigeria. The study adopted the survey design of the correlational type. The population comprised all the 643 library staff that possessed at least diploma or degree in library and information science, in the 45 university libraries in South-West Nigeria. Total enumeration (census) technique was adopted for the study and the instruments used for data collection were the questionnaire and Interview schedule. Data collected were analysed qualitatively and quantitatively, using the descriptive and correlation and regression analysis of inferential statistics. The findings of the study revealed that the most prevailing group of legal factors is dispute resolution ($\bar{x}$=3.21; std dev. =0.61), followed by dissolution ($\bar{x}$=3.14; std dev. =0.58), non-disclosure ($\bar{x}$=3.14; std dev. =0.58); log-in-option ($\bar{x}$=3.13; std dev. =0.58); cash contribution ($\bar{x}$=3.12; std dev. =0.62) and governing law ($\bar{x}$=3.09; std dev. =0.60). The finding reveals that legal factors altogether (r = .415; p<0.05) has significant positive relationship with consortium building readiness (CBR) among university libraries in South-West Nigeria. The study concludes that university libraries must provide legal factors to show their readiness for consortium building.

Keywords: Legal Factors, Consortium Building Readiness, University Libraries, Nigeria.

Introduction

A library consortium is a cooperative arrangement among libraries, with non-profit making intention, hoping to create and maintain a shared online catalogue in order to provide information services for members (Abioye and Awujoola, 2019). Resource sharing has become a very effective and useful driving tool in consortium building, since it is difficult for a single library to adequately provide everything that its users want. A consortium building, is therefore, a collective approach, aimed at reaching the information goals and meeting the information needs of users, through shared electronic library resources and reciprocal borrowing, offsite storage system and other cooperation and services to members and non-member libraries alike (Abioye and Awujoola, 2023).

The need for consortium building among university libraries includes: increasing the cost benefit per subscription among cooperating libraries, promoting the rational use of funds in libraries, ensuring the continuous subscription to the periodicals subscribed to in each library, ensuring local storage of the information acquired by libraries for continuous use by present and future users. Others include: helping to develop technological capabilities of the staff in the operation and use of electronic publication databases; strategic alliance with institutions that share common interest; for a reduced information cost and improved resource sharing. The creation of consortium platforms also aids the elimination of the different problems faced by university libraries in providing different information services to users, meeting the thrust of information of diverse people due to rapid growth of population all over the globe.

Consortia among university libraries have become essential because of their aspirations to reach out to more users and provide satisfactory services to them. University libraries, especially those in Nigeria must show readiness to benefit from the advantages provided through consortium building. A factor of readiness among university libraries are legal factors. University libraries collaborating must be bound by law and must observe some legal standards of the consortium. It is also believed that libraries that will join in building a consortium, as well as the intended consortium platform, be guided by law. Business Dictionary.Com (2010) defines law as the binding rules of conduct meant to enforce justice and prescribe duty or obligation, law is derived exclusively from custom or formal enactment by a ruler or legislature. Laws are rules that mandate or prohibit certain behaviours, they are drawn from ethics, which define socially acceptable behaviours.

A cogent concern for any library considering joining a consortium arrangement is that of a binding law, that would explain the sharing of information resources, and rendering services with other libraries. It is imperative, therefore, that a legally obligatory agreement about the governing law, information sharing , non-disclosure of log-in-option, dispute resolution, cash payment and contribution as well as terms of dissolution be documented. All potential consortium members should be invited to consent to a legal agreement before the implementation of the consortium building. In certain circumstances, the law will require the consortium building members to keep consortia matters confidential even without a written agreement in place, but this may be difficult and costly to prove in court. It is therefore best that for disclosing any kind of confidential information (particularly sensitive technical information), a "legal written confidentiality agreement" is drafted and signed by potential consortium members. This is important to safeguard the long term integrity of individual library and the platform. This approach emphasises on both the benefits and hazards of "association". It acknowledges that while there are benefits associated with strong and successful organisations, it could also be injurious in cases where consortium members get into trouble, the consequences are also borne by other organisations in the consortium (Cabinet Office: Office of the Third sector. 2008).

It is imperative, therefore, that a legally obligatory agreement about the governing law, information sharing, non-disclosure of log-in-option, dispute resolution, cash payment and contribution as well as terms of dissolution be documented. All potential consortium building members should be invited to consent to this agreement before any serious actions regarding the implementation of the consortium.

In certain circumstances, the law will require the consortium members to keep consortia matters confidential, even without a written agreement in place, but this can be difficult and costly to prove in court. It is therefore best that for disclosing any kind of confidential information (particularly sensitive technical information), a "written confidentiality agreement which is legal" is drafted and signed by potential consortium members. It is against this background that the study investigates legal factors as precursors of consortium building readiness among university libraries in South-West Nigeria.

Statement of the Problem

University libraries in many countries, especially those in less-developed countries, like Nigeria face tremendous challenges in meeting the ever growing world of knowledge and information demand of their users, due to diminishing budgets, galloping prices for subscribing to periodicals, purchasing materials and cost of ICT tools. These have warranted the

need for building consortium among university libraries as an approach to address the foregoing problems. However, some previous efforts at consortium building in Nigeria failed owning to lack of genuine readiness of university libraries to agree on legal factors to propel the consortium. The literature perused and preliminary investigation carried out by the researchers indicate absence of an established guidelines for deciding the governing laws, granting access to members, framework for settling disputes, dissolution and many more among the university libraries in South-West Nigeria. Therefore, the need to build a lasting consortium among university libraries in Nigeria has necessitated the investigation into legal factors that will improve the readiness for consortium building among them. Thus, the study investigates institutional, legal and ethical factors, as precursors of consortium building readiness among university libraries in South-West Nigeria.

Research Questions

The following research questions were answered in the study:

1. What are the prevailing legal factors for consortium building readiness among the university libraries in South-West Nigeria?

2. What is the level of consortium building readiness among the university libraries in South-West Nigeria?

Hypothesis

The following hypothesis was formulated for the study.

There is no significant relationship between legal factors (governing law, log-in-option, non-disclosure of log-in-option, dispute resolution, cash contribution and dissolution) and consortium building readiness among university libraries in South-West Nigeria

Literature Review

Law is an enterprise of subjecting human conduct to the governance of rules. It regulates the conducts and interactions of human together with their activities. Therefore, collaboration among libraries should have a guiding principle, as not much can be achieved under a loose arrangement. Nwegbu, Echezona and Obijiofo (2011) affirm that for information sharing to be successful, there should be mutual objectives, joint decision making process and continuous improvement for all participants. Collaboration is informal when there is undocumented agreement. Thus, according to Ullah (2015), effective collaboration and networking can be achieved by conforming to shared purposes, devising a framework for taking risks and ensuring ways to involve and trust partners. The governing law which is also known as consortium agreement or memorandum of understanding (MOU) must explain issues on formation, management, maintenance, communication and dissolution of the consortium which are contained under the Articles, Sections and Regulations in the agreement. Hence, as further noted by Ullah academic libraries collaborating must do such closely within a framework that will subsequently be maintained by the committee on standardisation and certification of the university commission in Nigeria. Bamgbose (2017) listed some legal issues to be considered among consortium building members, which are : governing laws, access and log-in-option, non-disclosure of log-in-options, cash and capital contribution modality, dispute settlement and cases of dissolution of consortium membership. McNair Chambers (2017) warned that a failure to choose a governing law clause can lead to uncertainty for the parties, as to which law will be applied to the contract, and can result in costly and lengthy dispute.

Access to resources is now considered more important than ownership of collections in buildings. Consequently, consortium building helps the collaborating libraries to get the benefit of wider access to electronic resources at affordable cost, and at the best terms of licenses. Bedi and Sharma (2008) argue that a consortium, with the collective strength of resources of various institutions available to it, is in a better position to resolve the problems of managing, organising and archiving the electronic resources. Biogeochemical Flux Model (BFM) Released Meeting Agenda of 2013 pointed out that access or log-in into the consortium network can be in two forms: One, is by IP-based. By this, the registration is hosted by using the Internet configuration of the host institution. This will ensure

that only those who have access to connect to the institution's network make use of this database, this mode may not work when collaborating institutions are not in close proximity. The other log-in option has provision for user name and password, wherein any user who is able to correctly put-in the details can access the database irrespective of the location of the user. However, (Bamigbose, 2017; EMIDA, ERA-NET: Guidelines for a consortium agreement, 2017; BFM Released Meeting, 2013; Ambient Assisted Living (AAL), 2006) disclosed that the only disadvantage of this option is that if not properly handled, such log-in details may get into the hands of unauthorised users and by extension, infringe on the service agreement of non-disclosure to third party

Dispute Resolution Mechanism (DRM) according to BFM Released Meeting Agenda of 2013, is equally very essential in the legal framework of consortium. Parties are to agree beforehand on how disputes are to be resolved when they arise. The agreement should state the medium to be deployed when seeking redress among members such as: use of conventional courts or through Alternative Dispute Resolution (ADR). BFM Released Meeting Agenda (2013) further explained that ADR simply refers to a dispute resolution mechanism that encourages amicable resolution of dispute outside the court rooms using different options such as: arbitration, mediation, conciliation and reconciliation. Many institutions usually try to avoid going to courts by simply opting for alternative dispute resolution as it takes less of time and less formal. So, matters are dispensed with, quickly using this medium (Bamgbose, 2018; EMIDA, ERA-NET: Guidelines for a consortium agreement, 2017; BFM Released Meeting, 2013; Ambient Assisted Living (AAL), 2006).

Financial contribution and term of payment is one of the major challenges to the survival of consortium is the issue of finance. Alemna and Antwi (2002) also note that one of the main hindrances to library consortia development in Africa is the issue of finance. According to Bozimo (2011), membership in consortium truly means membership involvement, in part, payment of stipulated fees to the consortium for the purchase of e-resources and participation of the libraries in activities and services offered by the consortium. Abubakar (2011) notes that of all the different types of libraries in Nigeria, only university libraries have a clearly defined policy of funding, because they are allocated 10% of the recurrent annual budget of their parent institutions. However, it is regrettable that such monies are not forthcoming, as most university administrators tend to flout the policy of allocating 10% of the recurrent annual budget of their parent institutions to libraries.

The library is a growing organism therefore, the consortium building is expected to run indefinitely. However, there may be need for the dissolution of consortium or the termination of consortium agreement or any members' participation in the consortium. This is why EMIDA, ERA-NET Guidelines for a consortium agreement of 2017 and BFM Released Meeting Agenda of 2013; Ambient Assisted Living (AAL), (2006) emphasised that the consortium agreement or the grant agreement should clearly specify cases in which a termination of the consortium agreement before the end of the project or an early termination of an individual project partner's participation in the consortium can take place.

Methodology

The study adopted the survey design of the correlational type. The population were the 45 (6 federal universities, 9 state universities and 30 private universities) located in South-West Nigeria (Omotosho, 2018). While the target population were 643 library personnel in these university libraries. The questionnaire and interview schedule was instruments used for data collection. The information collected through the interview with the key informants (9 university librarians or their suggested representatives on consortium initiative were reached out to (phone call) or personally) was subjected to thematic content analysis. This assisted the researchers to express responses of the interviews in line with the appropriate categories (rating scale/ 4 Likert) to compliment the quantitative results that were generated. The data was analysed qualitatively and quantitatively, using descriptive and inferential statistics, correlation and regression analysis. The study used the Statistical Package for the Social Sciences (SPSS) version 20 software.

Findings and Discussion

Out of the 643 copies of the questionnaire distributed,

549 (85.4%) were returned duly completed. This high response rate was achieved due to the researcher's persistence, and effective assistance of the library personnel in the studied universities. The findings from the analysis on the data collected were discussed in line with the research questions and hypothesis raised in the study. The findings from the research questions are discussed as follows:

The Prevailing Legal Factors for Consortium Building Readiness among the University Libraries in South-West Nigeria

The first research question set out to ascertain the respondents' response on the prevailing legal factors for consortium building. The legal factors have been identified and grouped as governing law, log-in-option, non-disclosure of log-in-option, dispute resolution, cash contribution, dissolution. The university library personnel were instructed to show their agreement using Likert four scale of Strongly agree (SA), Agree (A), Disagree (D) and Strongly disagree (SD) with items that were developed. The results were presented in Table 1.

Table 1: Prevailing legal issues for consortium building readiness among university libraries in South-West Nigeria

S/N	Items	SA	%	A	%	D	%	SD	%	Mean ($\bar{x}$)	Std. Dev
Governing law											
1.	My library is willing to sign full consent before operating as consortium member.	97	17.7%	344	62.7%	108	19.7%	0	0.0%	2.98	.611
2.	Governing law should make provision for issues that may not be envisage before the consortium implementation	121	22.0%	383	69.8%	43	7.8%	2	0.4%	3.13	.544
3.	There is a legal and ethical committee for consortium monitoring in my library	113	20.6%	273	49.7%	143	26.0%	20	3.6%	2.87	.773
4.	Copies of the legal issues concerning the consortium should be printed and made available to member libraries.	146	26.6%	376	68.5%	26	4.7%	1	0.2%	3.21	.524
5.	Consortium agreement should be administered in line with the laws of Nigeria and other countries too.	168	30.6%	359	65.4%	20	3.6%	2	0.4%	3.26	.537
Weighted mean=3.09; Std. dev=0.60											
Log-in-option											
6.	Consortium libraries will confirm and comply when issues concerning access to information have legal force backing it.	159	29.0%	358	65.2%	24	4.4%	8	1.5%	3.22	.588
7.	Access should be limited to consortium libraries alone.	120	21.9%	361	65.8%	65	11.8%	3	0.5%	3.09	.593
8.	Request to access from non-member library should be made in writing and approved by all member libraries	123	22.4%	373	67.9%	53	9.7%	0	0.0%	3.13	.552
9.	Access can be granted to non-consortium member libraries if they have satisfied the conditions that such access would be used for intended purpose.	104	18.9%	399	72.7%	46	8.4%	0	0.0%	3.11	.512
10	Access right should confer some entitlement for libraries to grant sub-licenses to non-member libraries for some reasons.	136	24.8%	355	64.7%	47	8.6%	11	2.0%	3.12	.632
Weighted mean =3.13; Std. dev=0.58											
Non-disclosure											
11.	There are certain conditions where consortium confidential information can be disclosed, however, such conditions should be explained in the consortium agreement.	107	19.5%	285	51.9%	142	25.9%	15	2.7%	2.88	.742
12.	It is totally illegal for any member to disclose the activities and information of the consortium to non-member.	104	18.9%	368	67.0%	67	12.2%	10	1.8%	3.03	.620

13.	There should be penalties for misuse or unauthorised disclosure of consortium information.	153	27.9%	367	66.8%	27	4.9%	2	0.4%	3.22	.542
14.	There should be a clearly stated confidential clause to explain what information is considered confidential or otherwise.	148	27.0%	388	70.7%	13	2.4%	0	0.0%	3.25	.483
15.	Confidentiality clause should explain procedures to be taken before sharing confidential information to non-member libraries	194	35.3%	337	61.4%	18	3.3%	0	0.0%	3.32	.533
Weighted mean =3.14; Std. dev=0.58											
Dispute resolution											
S/N	**Items**	**SA**	**%**	**A**	**%**	**D**	**%**	**SD**	**%**	**Mean ($\bar{x}$)**	**Std. Dev**
16.	Dispute resolution processes should be well explained in the legal document of the consortium.	192	35.0%	347	63.2%	10	1.8%	0	0.0%	3.33	.508
17.	Libraries in consortium should opt for alternative dispute resolution strategy (good faith effort) instead of approaching court.	167	30.4%	338	61.6%	42	7.7%	2	0.4%	3.22	.589
18.	Arbitrator(s) for dispute resolution committee should be from outside the consortium member libraries	181	33.0%	297	54.1%	67	12.2%	4	0.7%	3.19	.667
19.	Court is the best place for litigation on issues of partnership	130	23.7%	328	59.7%	68	12.4%	23	4.2%	3.03	.727
20.	It is good for libraries to try alternative dispute settlement first before trying the court	177	32.2%	354	64.5%	11	2.0%	7	1.3%	3.28	.563
Weighted mean =3.21; Std. dev=0.61											
Cash contribution											
21.	Cash division and quota must be explained to libraries with full written agreement.	143	26.0%	393	71.6%	12	2.2%	1	0.2%	3.23	.485
22.	Breaches of non-payment of dues and cash contributions are serious legal issues and serious legal actions should be taken against erring libraries.	147	26.8%	373	67.9%	29	5.3%	0	0.0%	3.21	.524
23.	Cash payment should be based on each library's financial strength and not be shared equally.	118	21.5%	315	57.4%	83	15.1%	33	6.0%	2.94	.777
24.	Member library without financial strength can pay in kind (products, services)	116	21.1%	329	59.9%	98	17.9%	6	1.1%	3.01	.659
25.	Libraries will naturally be unfaithful to cash contribution and terms of payment if it is not backed by law or legal actions.	176	32.1%	332	60.5%	31	5.6%	10	1.8%	3.23	.632
Weighted mean =3.12; Std. dev=0.62											
Dissolution											
26.	It is necessary that the consortium set a definite or indefinite period after the termination of the consortium / membership during which confidential information has to be kept confidential.	119	21.7%	393	71.6%	30	5.5%	7	1.3%	3.14	.552
27.	Court is the best and the most appropriate means of litigation for consortium building issues.	106	19.3%	348	63.4%	81	14.8%	14	2.6%	2.99	.666
28.	Termination of consortium membership should be upon a library's rejection or failure to keep their consortium agreement promises	145	26.4%	378	68.9%	20	3.6%	6	1.1%	3.21	.550
29.	Upon the presentation of notice, a party membership can be terminated if such requirements have been met.	89	16.2%	432	78.7%	27	4.9%	1	0.2%	3.11	.455
30.	Summary termination of consortium membership can be in cases of fraud, misinterpretation or illegal activities of libraries	164	29.9%	367	66.8%	18	3.3%	0	0.0%	3.27	.511
Weighted mean =3.14; Std. dev=0.55											
Overall weighted mean =3.14; Std. dev= 0.59											

The result of item-by-item analysis on Table 1 indicates that the respondents revealed that some of the most prevailing legal factors for consortium building readiness were that: dispute resolution processes should be well explained in the legal document of the consortium ($\bar{x}$=3.33; std dev. =.508); furthermore, confidentiality clause should explain procedures to be taken before sharing confidential information to non-member libraries ($\bar{x}$=3.32; std dev. =.533); and that it is good for libraries involved to try alternative dispute settlement first before trying the court ($\bar{x}$=3.28; std dev. =.563).

The least prevailing legal factors are that: there was no legal and ethical committee for consortium monitoring in my library ($\bar{x}$=2.87; std dev. =.773); there should be some certain conditions where consortium confidential information can be disclosed, however, such conditions should be explained in the consortium agreement ($\bar{x}$=2.88; std dev. =.742); and that cash payment should be based on each library's financial strength and not be shared equally ($\bar{x}$=2.94 std dev. =.777).

Explaining by sub-groups, dispute resolution ($\bar{x}$=3.21; std dev. =0.61) must be first settled by libraries intending to join consortium, issues on dissolution ($\bar{x}$=3.14; std dev. =0.58), non-disclosure ($\bar{x}$=3.14; std dev. =0.58); log-in-option ($\bar{x}$=3.13; std dev. =0.58); cash contribution ($\bar{x}$=3.12; std dev. =0.62) and governing law ($\bar{x}$=3.09; std dev. =0.60) must thereafter be discussed.

The Level of Consortium Building Readiness among the University Libraries in South-West Nigeria

In order to ascertain the respondents' response on the level of consortium building readiness among university libraries, the university library personnel were asked to signify their agreement or disagreement with items that were developed as contained in the scale: Strongly agree (SA), Agree (A), Disagree (D) and Strongly disagree (SD). The results were presented in Table 2.

Table 2: Level of consortium building readiness among university libraries in South-West Nigeria

S/N	Items	SA	%	A	%	D	%	SD	%	Mean ($\bar{x}$)	Std.Dev
1.	Collectively pull resources together with various institutions to better solve the challenges of managing, organising and archiving electronic resources	154	28.1%	324	59.0%	42	7.7%	29	5.3%	3.10	.748
2.	Share resources that are more important to the users in its collection	144	26.2%	354	64.5%	51	9.3%	0	0.0%	3.17	.572
3.	Grant other libraries access as access is believed to be more important than building collections	134	24.4%	357	65.0%	56	10.2%	2	0.4%	3.13	.586
4.	For reciprocal access to its Internet and wireless computing	78	14.2%	426	77.6%	43	7.8%	2	0.4%	3.06	.482
5.	Share their expertise with other libraries	166	30.2%	365	66.5%	16	2.9%	2	0.4%	3.27	.525
6.	come under a regulatory body which would support consortium development	120	21.9%	400	72.9%	26	4.7%	3	0.5%	3.16	.512
7.	Encourage cooperative efforts in training and research	204	37.2%	337	61.4%	8	1.5%	0	0.0%	3.36	.509
8.	Advance its services through innovation and opportunities provided by ICT	250	45.5%	288	52.5%	11	2.0%	0	0.0%	3.44	.535
9.	For strategic sharing and exchange of information, experience and best practices	212	38.6%	316	57.6%	21	3.8%	0	0.0%	3.35	.551
10	For profitable professional partnerships	186	33.9%	330	60.1%	33	6.0%	0	0.0%	3.28	.567
11.	Join a country-wide acquisition policy to avoid unnecessary and wasteful duplication in purchase	192	35.0%	331	60.3%	26	4.7%	0	0.0%	3.30	.553
12.	Cooperate in processing of information resources	184	33.5%	342	62.3%	22	4.0%	1	0.2%	3.29	.546
13.	For access and downloads of resources remotely by users of the participating libraries	177	32.2%	334	60.8%	37	6.7%	1	0.2%	3.25	.578
14.	Support the establishment of an electronic journal centre to serve as permanent archive for electronic journals	133	24.2%	391	71.2%	25	4.6%	0	0.0%	3.20	.500

15.	The library is ready to share integrated library systems	112	20.4%	403	73.4%	32	5.8%	2	0.4%	3.14	.508
16.	Share digital and offsite repositories	103	18.8%	418	76.1%	25	4.6%	3	0.5%	3.13	.488
17.	For collective preservation and archiving activities of print and digital materials and digitisation services	114	31.7%	340	61.9%	35	6.4%	0	0.0%	3.25	.563
18.	For reciprocal borrowing agreement among participating libraries	149	27.1%	366	66.7%	34	6.2%	0	0.0%	3.21	.539
19.	For cooperative collection development	123	22.4%	367	66.8%	58	10.6%	1	0.2%	3.11	.570
20.	For the development of a more sophisticated search engine enabling simultaneous search of multiple databases	161	29.3%	357	65.0%	29	5.3%	2	0.4%	3.23	.554
Weighted mean=3.22; Std. dev=0.55											

Table 2 shows the level of consortium building readiness among university libraries in South-West Nigeria. The finding reveals that university libraries in South-West Nigeria are ready: to advance their services through innovation and opportunities provided by ICT ($\bar{x}$=3.44; std dev. =.535); encourage cooperative efforts in training and research ($\bar{x}$=3.36; std dev. =.509); for strategic sharing and exchange of information, experience and best practices ($\bar{x}$=3.35; std dev. =.551); to join a country-wide acquisition policy to avoid unnecessary and wasteful duplication in purchase ($\bar{x}$=3.30; std dev. =.553); to cooperate in processing of information resources ($\bar{x}$=3.29; std dev. =.546); for profitable professional partnerships ($\bar{x}$=3.28; std dev. =.567); to share their expertise with other libraries ($\bar{x}$=3.27; std dev. =.525); for joint preservation and archiving activities of print and digital materials and digitisation services ($\bar{x}$=3.25; std dev. =.563).

In order to affirm the level of consortium building readiness among university libraries in South-West Nigeria, a test of norm was conducted. Results showed that scale between 1 – 1.33 is low, 1.34 – 2.66 is moderate, while 2.67 – 4 is high. The overall mean for consortium building readiness among university libraries is "3.22" which falls between the scales "2.67 – 4". It can therefore be concluded that the level of consortium building readiness among university libraries in South-West Nigeria is slightly high, which means that in a certain level university libraries in Nigeria are ready.

Hypothesis Testing Analysis

The finding from the analysis on the data collected with respect to the hypothesis raised in the study is discussed as follows:

Hypothesis: There is no significant relationship between legal factors (governing law, log-in-option, non-disclosure of log-in-option, dispute resolution, cash contribution and dissolution) and consortium building readiness among university libraries in South-West Nigeria.

Table 3: Relationship between legal factors and consortium building readiness

Variables	N	Mean	St. Dev	Df	r	*P*	Sig
Consortium building readiness	549	64.43	7.150				
Legal factors	549	94.22	9.194	548	.415	.000	Sig
Sub-legal factors							
Governing law	549	15.46	2.221	548	.385	.000	Sig
Log-in-option	549	15.66	1.984	548	.299	.000	Sig
Non-disclosure	549	15.70	1.902	548	.178	.000	Sig
Dispute resolution	549	16.05	2.167	548	.248	.000	Sig
Cash contribution	549	15.63	1.962	548	.444	.000	Sig
Dissolution	549	15.71	1.946	548	.318	.000	Sig

Note: hypothesis is tested at 0.05 significant level

The findings on the relationship between legal factors (governing law, log-in-option, non-disclosure of log-in-option, dispute resolution, cash contribution and dissolution) and consortium building readiness (CBR) among university libraries in South-West Nigeria as shown in Table 3 above reveals that legal factors altogether ($r = .415$; $p<0.05$) has significant positive relationship with consortium building readiness (CBR) among university libraries in South-West Nigeria. A further breakdown of the analysis to show the performance of the sub-legal factors in relation to CBR reveals that all the sub-factors are positively and significantly correlated with CBR; cash contribution is the most potent sub-factor ($r = .444$; $p<0.05$), followed by governing law ($r = .385$; $p<0.05$), dissolution ($r = .318$; $p<0.05$), log-in-option ($r = .299$; $p<0.05$) among others.

This, therefore, implies that there is positive linear association between legal factors (governing law, log-in-option, non-disclosure of log-in-option, dispute resolution, cash contribution and dissolution) and consortium building readiness (CBR) among university libraries in South-West Nigeria.

Analysis of the Interview Responses

Interview responses were apportioned a grading scale to aid thematic analysis. Responses were grouped into four Likert scales of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) or Very Ready (VR), Ready (R). Fairly Ready (FR) and Not Ready (NR) as the case may be in line with the response format for the question asked. The responses are shown in table 4 below:

Table 4: Interview response of university librarians or their representative

S/N	Readiness of university libraries	Very ready	Ready	Fairly ready	Not ready
1	How ready is your library for consortium building?	2	4	3	-
	Legal framework	**SA**	**A**	**D**	**SD**
1	The libraries have legal framework that could facilitate consortium building	Nil	Nil	5	4

From the above table, six of the respondents clearly indicated that consortium building is an inevitable reality in the library world, as no single university library can adequately cater and provide for all that its users want by specifying some level of readiness of their university libraries for consortium building whenever there is a move for it as they agreed that consortium has lots of benefits. All of the participants affirmed that their university libraries were already in one form of partnership or another with other libraries. Although these partnerships according to them may not actually look like the standard consortium building, that is technology-driven and with heavy subscriptions to different online information databases. These university libraries however belong to some forms of collaboration that could help them cater for their inadequacies. These university libraries partner to share information resources (both prints and electronic), inter-library loaning, cooperate staff training among others.

On legal framework that could facilitate consortium building, none of the interviewed university library heads was sure of any written legal document for the library that explains the terms and conditions for any formal library collaboration or consortium. These heads believed that though there were written and unwritten rules that had governed their libraries activities with other university libraries in time past, however, none of these principles and rules is documented as laws. They believed that when the move for library consortium starts that each university library would be forced to have a written law.

Conclusion and Recommendations

The most prevailing legal factors for consortium building readiness were dispute resolution processes to be well explained in the legal document of the consortium, confidentiality clause to explain procedures to be taken before sharing confidential information to non-member libraries and that it is good for libraries involved to try alternative dispute settlement first before trying the court. The least prevailing legal factors are there was no legal and ethical committee for consortium monitoring in that there should be some certain conditions where consortium confidential information can be disclosed. The finding reveals that university libraries in South-West Nigeria are ready to advance their services through innovation and opportunities provided by ICT, encourage cooperative efforts in training and research for strategic sharing and exchange of information, experience and best practices, to join a country-wide acquisition policy to avoid unnecessary and wasteful duplication in purchase, to cooperate in processing of information resources for profitable professional partnerships, to share their expertise with other libraries for joint preservation and archiving activities of print and digital materials and digitisation services.

The study concluded that there is positive linear association between legal factors (governing law, log-in-option, non-disclosure of log-in-option, dispute resolution, cash contribution and dissolution) and consortium building readiness (CBR) among university libraries in South-West Nigeria. It is concluded therefore that legal factors are predictors for consortium building readiness among university libraries in South-West Nigeria.

Based on the findings of the study, the following recommendations are made:

1. University library managements should as a matter of urgency formulate a written and well documented consortium building policies and laws for their libraries as the information elicited from the interviews conducted confirmed that there is no such policy in the university libraries studied. Attention however must be paid in the written laws to issues concerning dispute resolution, dissolution of membership or the consortium, non-disclosure of log-in-option as well as cash contribution.
2. It is imperative for university library managements to provide functional institutional factors, a well written legal law as well as business and professional ethical codes that will further boost the readiness level of university libraries towards consortium building. Although the study found that the level of university libraries readiness is moderately high but this can be improved upon.
3. University libraries in South-West Nigeria must be sincere in their desire to join and run a consortium, as it is the only viable means through which university libraries can adequately satisfy the information needs of their users.

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Attitude of Traditional Health Practitioners to the Documentation of Indigenous Knowledge in South-West, Nigeria

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Abstract

Indigenous knowledge (IK) plays prominent roles in primary healthcare. IK is prone to distortion and it is gradually going into extinction, due to its oral nature and the lukewarm attitude of the younger generation. Therefore, this study investigated attitude of traditional health practitioners (THP) to the documentation of indigenous knowledge in South-West, Nigeria. The study adopted the descriptive research design of the correlational type. Three hundred and sixty-two (362) THP were sampled out of the population of 3,850 using Yaro Yemane model for calculating sample size. Traditional health practitioners were purposefully selected because of their roles in primary health care. Proportional sampling technique was used to determine the sample for each state in South-West, Nigeria. The research question was answered, using mean and standard deviation, while Pearson Moment correlation analysis was used to test research hypothesis. The findings of the study revealed that traditional health practitioners have positive attitude to the documentation of IK, wanting other people to know about their IK (mean= 4.19) and that there is significant relationship between attitude and documentation of IK. The study therefore concluded that the traditional health practitioners in South-West, Nigeria, have positive attitude to the documentation of IK.

Keywords: Indigenous Knowledge, Traditional Health Practitioners, Attitude, Documentation, Nigeria.

Introduction

Indigenous knowledge (IK) is also known as native knowledge, which has been very germane to the survival of the indigenous people from time immemorial. It has wide application in agriculture, security, environmental management, indigenous technology, and most importantly in the management of animal and human health. Its use was prominent before modern civilisation because it was the main source of knowledge available to the people at that time. Indigenous knowledge is a traditional model of healthcare that depends on plants that have medicinal properties and animals for healing human diseases.

IK is the pattern of life of the indigenous communities; the practices handed down from generation to generation and passed on without keeping the records. There are other synonyms for indigenous knowledge among them are; traditional

knowledge, local knowledge, rural knowledge among others (Jain and Jibril, 2016). The knowledge had been with the indigenous communities before the advent of the colonial government in Africa. Indigenous people were applying it in the cultivation of cash and food crops, rearing of animals, environmental management, transportation, security, healthcare among others.

However, during colonisation, Europeans came with their knowledge, which they felt was superior to the African IK. Hence, IK was not popular and marginalised to the extent that, it was misconstrued as primitive, uncivilised and devilish. This presumption of the colonial administrators premised on the fact that existing African IK cannot be scientifically substantiated, compared with Eurocentric knowledge that can be proved scientifically. Colonialism deprived the indigenous community of the opportunity to develop and use their survival knowledge; they made the locals to see their IK as non-important; consequently, the relegation and decline of anything indigenous in the colonies were obvious.

Nevertheless, there were some primitive practices discontinued by the colonial administration, which include human sacrifice and killing of twins in Calabar before Mary Slessor advocated for its stoppage. The introduction of education by the missionaries to Africans, most especially to British West Africa, is also commendable. In the contemporary time, all over the world, and in total departure from the view of colonial administration and administrators about the non-usefulness of IK, the knowledge is very relevant in the healthcare system most especially in rural communities. There is an improvement in the consciousness of the value of medicinal plants; the World Bank, World Health Organisations and other international organisations are promoting the use of traditional medical knowledge due to its crucial roles in primary healthcare in third world countries.

The global pandemic, occasioned by the Coronavirus also known as COVID-19, has also revealed the importance of IK. The first case of the virus infection was in Wuhan, China in early December 2019. COVID-19 was officially declared a pandemic on 11 March 2020. In April 2020, it had spread to over 200 countries, with more than 1,700,000 established cases and 111,600 fatalities(Helmy, Fawzy, Elaswad, Sobieh Kenney and Shehata, 2020). To prevent further spread of this virus, government all over the world put up some measures, such as restrictions on international and national travels and large gatherings, closure of offices, markets among others. Apart from the responses to COVID-19 pandemic by government and international organisations, people responded by making use of indigenous food sources and traditional medicine to mitigate the effects of the pandemic (Walters, Broome, and Cracco, 2021).

The use of IK in form of herbal remedies, roots, and some natural immune boosters such as garlic, ginger, turmeric, onion, cucumber, broccoli and other naturals significantly increased during the COVID-19 lockdown. People resorted to the use of natural products to boost their immunity and to fortify their body systems to fight the killer virus. The use of indigenous immune boosters was instrumental to the recovery of some infected persons including the Governor of Oyo State, Seyi Makinde, who revealed that during the period of his isolation, he was using a mixture of black seed oil and honey to boost his body immunity to fight the killer virus (Onyenucheya, 2020).

President of Madagascar, Andry Rajoelina, claimed that his country discovered a traditional medicine, which was very efficacious in the management of the deadly disease. According to him, the traditional medicine had cured two cases of COVID-19 in Madagascar and suppressed the symptoms in some others. The medicine was developed by the Malagasy Institute of Applied Research, saddled with the responsibility of researching the uses of Madagascar's traditional medicines. Rather than waiting for the development of drugs or possibly vaccine to increase the immunity of the body against the viral infection, the country resulted to the use of IK to fight COVID-19. The possibilities of the World Health Organisation accepting COVID-Organics developed by Madagascar as the possible cure for COVID-19 is still in doubt due to the age-long discrimination against IK and Africans in general (Abreu, 2020).

Traditional knowledge is local expertise, used for the survival of people in rural communities over a long period and it is quite different from scientific knowledge. Some aspects of IK may be difficult to validate scientifically; this may likely be the root cause of discrimination and marginalisation of the

knowledge by many orthodox medical practitioners. IK is what native people know and have been doing for generations. It has been the basis for the survival of indigenous people in their local environment. Lazarus, Unegbu and Opeke (2019) citing Nnadozie (2013) highlighted different terms common with IK such as indigenous technical knowledge, oral tradition, local knowledge, and peoples' knowledge.

Indigenous knowledge is an accumulated knowledge, competence, practices and representation developed by people because of their continuous interaction with the natural environment (UNESCO, 2003). This is the knowledge possessed by individuals, groups and the whole community in a particular environment. It has been the basis of their survival from generation to generation (Su, Ren, Qin, Hou and Wen, 2020). This is the traditional knowledge developed through local innovations, practices learnt and mastered over a long period, which has greatly influenced the life of the people and is their cultural identity (World Intellectual Property Organization WIPO, 2005; Rao and Ramanag, 2007).

"Attitude is the degree to which a person has favourable or unfavourable evaluation or appraisal of behaviour. Attitude is made up of the belief people hold about the object and the associated evaluation of that belief. Attitude is presumed to form a bipolar continuum, from a negative evaluation on one end to a positive evaluation on the other (Ajzen, 1991). Attitude that are highly accessible from memory are more likely to guide behaviour than less accessible attitude (Brook and Warren, 2018). The nature of IK coupled, with the oral mode of transmission makes it prone to distortions. The knowledge is gradually disappearing due to the negative attitude to its documentation, memory loss and demise of the holders.

Attitude and behaviour are like cause and effect, there is a relationship between attitude and behaviour, the behaviour exhibited by an individual towards an animate or inanimate object is determined by attitude. The tendency of executing a project in which an individual has positive attitude is very high compared with what the person has a negative attitude. This attitude is stored in the subconscious of human beings and influenced by training, exposure, availability and accessibility of information, previous experiences and wrong judgment. Attitude is an enduring concept, which is stored in the memory and retrievable at will (Eagly and Chaiken, 2007). It is a relatively enduring organisation of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols (Hogg and Vaughan, 2005).

Although there are different definitions of attitude in the literature, scholars perceive attitude as a "positive or negative (affective) tone and the postural characteristics that predispose its holder to one posture or the other". Ilo (2013) submitted that attitude is what has been limiting the adoption of modern technology in the documentation of IK. The knowledge of the communities is very important to them and could not allow it to be documented using ICT because it would become global knowledge thereby depriving the communities the exclusive access to their IK.

Some IK holders, most especially the traditional health practitioners want to monopolise their knowledge among their members. Therefore, whoever does not belong to their circle (cult) cannot have access to such unique knowledge not to talk about documentation. Those that are privy to that type of IK may likely resist any attempt to make it open through any form of documentation. Some IK holders have a negative attitude to the documentation of their IK in databases. Traditional health practitioners want to prevent other people from accessing their IK; they would not want the knowledge to be in public domain to preserve the source of their livelihood. Their fear may also be genuine, IK is very sensitive and if there is no adequate control, it can be misused. For instance, in Venezuela, the people want to be involved in the decision on the use of their IK before supporting any documentation in the database known as Biozulua(Dlamini and Nokwanda, 2021).

In India, similar attitude and fear were exhibited by the traditional health practitioners; IK holders insisted on deciding the type of information stored in the database and before integrating the knowledge, the picture of the holder is necessary and that they have a reservation on how the information would be used (Fredriksson, 2021). To allay the fears of the knowledge holders and prevent biopiracy, there is a need to ensure that before patenting any IK, there should be a means of crosschecking the originality of the claim of the individual or group seeking intellectual property protection. This is achievable by

creating a comprehensive database, or means of notifying the public before approving the patent. According to WIPO (2020), this is achievable when there is a comprehensive database that is well classified and indexed. The database should be user-friendly and capable of exchanging data with other IK based databases to confirm the authenticity of claims (Biber-Klemm, Cullet, Germann, Muller, and Curci, 2006).

Statement of the Problem

IK has been playing significant roles in the survival of various communities in many parts of the world. It has a very wide application in the areas of agriculture, housing, urban and regional planning, healthcare, wildlife management, before the advent of western civilization (Wahab, 2010). IK is declining at an alarming rate due to rapid land degradation, such as deforestation, access to conventional medicine and exposure to western lifestyles, hence, the cultural values handed over from generation to generation may likely go into extinction, if urgent steps are not taken to document the knowledge (Das and Sarkhel, 2016). Oral nature of IK and non-recognition of the knowledge due to over reliance on modern day knowledge system are contributing to the negative attitude towards documentation of IK. Mapara (2009) identified some factors responsible for the loss of IK which are; rural urban migration, changes in population structure, threat from modern technology and attitude. There is a strong connection between attitude and behaviour. The tendency of an individual performing a particular action in which he has positive attitude is very high compared to what the person has negative attitude. The attitude is stored in the subconsciousness of a man, which may be as a result of training, exposure, available information, previous experiences and can be a function of wrong judgement (Hogg and Vaughan, 2005). On this note, the study investigates the attitude of traditional health practitioners towards the documentation of their knowledge of traditional medicine.

Objectives of the Study

The objectives are to:

(i) investigate the attitude of traditional health practitioners to the documentation of indigenous knowledge in South-West, Nigeria;

(ii) establish the relationship between attitude and the documentation of IK by traditional health practitioners in South-West, Nigeria.

Research Question

What is the attitude of traditional health practitioners to the documentation of indigenous knowledge in South-West, Nigeria?

Research Hypothesis

There is no significant relationship between attitude and the documentation of IK by traditional health practitioners in South-West, Nigeria.

Literature Review

Meyer (2009) submitted that the approach to IK varies from community to community, because of some salient factors, such as attitude, perceptions, norms, socio-political influence, usefulness and belief of the members of the indigenous communities. The attitude of the knowledge holders is very crucial to the documentation of IK, most especially in Nigeria where the national and public libraries are not doing much towards the documentation of IK as their contemporary in developed countries.

However, relying on the knowledge holders to kick start the documentation process without proper encouragement, mobilisations and collaboration may be the major reasons why the knowledge is gradually going into extinction. A little impetus in some cases is enough motivation for the knowledge holders to commence "Attitude is the degree to which a person has favourable or unfavourable evaluation or appraisal of behaviour. Attitude is made up of the belief people hold about the object and the associated evaluation of that belief. Attitude is presumed to form a bipolar continuum, from a negative evaluation on one end to a positive evaluation on the other (Ajzen, 1991). Attitude that is highly accessible from memory is more likely to guide behaviour than less accessible attitude (Brook and Warren, 2018). The nature of IK coupled, with the oral mode of transmission makes it prone to distortions. The knowledge is gradually disappearing due to the negative attitude to its documentation, memory loss and demise of the holders. The documentation of their valuable IK for immediate and future benefits, as in the case of public librarians in Botswana. According to Jain and Jibril (2016), efforts made in

Botswana towards documentation by the public libraries yielded positive results. They launched a programme called "Memories of Old Kasane" meant to document IK of Kasane people such as their oral archives, folklore, drama and other traditions. The objective of the initiative was to promote tourism in Botswana. Kasane is known for tourism, it attracts tourists from many part of the world. Another project was initiated by public libraries in Palapye, the library collaborated with the indigenous community to document their IK.

Collaboration between librarians and IK holders in Molalatau was productive. It led to the documentation and production of the indigenous language (Sebirwa) dictionary. In the Okavango, which was another region in Botswana, they were able to capture IK of basket weaving with the aim of preserving the knowledge for future generation. In Mankgodi, collaboration between the librarians and the community led to the documentation of indigenous plants used in healthcare to preserve it for current and future use (Jain and Jibril, 2016).

Attitude is very germane in the documentation of IK; when practitioners have positive attitude to documentation, they will find a way of putting their knowledge down in written form to preserve them for the future. It is a common practice among Yoruba people in South-West, Nigeria for elders to transmit their IK to their heirs, whenever they are about to die; to forestall the loss of knowledge and values transmitted to them by their predecessors. The elders approaching the grave ought to transmit their knowledge to the succeeding generation before death to ensure the continuity of the knowledge. This mode of transmission is very unreliable because death is highly unpredictable; many of them die in some unforeseen circumstances before transmitting their IK to their successors.

Secrecy about IK is a negative attitude hindering documentation; some custodians are so secretive about their knowledge most especially traditional healers; they usually find it difficult to disclose the healing power of their IK to those who are not members of their family. They prefer to die with their IK than to reveal them to aliens. They are too conservative about their IK to the extent that their female children were not privy to their knowledge; they were of the opinion that marital relationship will definitely transmit their IK to another family; their daughters will reveal their healing power to their husbands, thereby indirectly transferring their IK to another family (Tabuti and Damme, 2012). IK custodians have divergent attitude to the documentation; while some have expressed their views supporting the adoption of IK databases as means of documentation others were sceptical of this initiative (World Indigenous Peoples' Conference on Education, 1999).

The rate at which IK is lost has made some indigenous communities to support documentation to mitigate the colossal loss. In Australia, for example, indigenous communities are throwing their weight behind documentation of their IK in databases, because of their commitment to the transmission of their knowledge to the next generation. They opined that the younger generation was not showing interest in the traditional knowledge, due to their exposure to Western education and that the elders who were the repository were dying, therefore, documentation was the only hope of survival of their IK (Shehu, 2020).

This unique IK resides among few traditional health practitioners, hence, documenting such becomes difficult and impossible. Few herbalists who have expertise in the use of knowledge of plant and animal to resolve health challenges use them to generating income for themselves. Hence, they prefer to keep their IK to themselves, by not documenting them to protect the source of their livelihood. The nature of some African traditional medicines used for the treatment of physical, emotional and spiritual problems is another reason for the negative attitude towards documentation of such IK (Ezekwesili-Ofili and Okaka, 2019).

Negative attitude to documentation exhibited by some traditional health practitioners was fundamental to protect themselves and the sources of their livelihood. Some traditional health practitioners in Central Africa were not ready to support any activities that could lead to capturing their knowledge in any form, most especially the elderly herbalist. They were not willing to teach other people their IK or consent to document it in any format. This could be attributed to the attitude of those who were taking advantage of the traditional medical knowledge of the indigenous communities to enrich themselves at the detriments of the knowledge holders. Some norms may likely influence the attitude

of THP to the documentation of IK, Olatokun (2010) submitted that some norms prevent women from participating in traditional health practices.

The elderly traditional holders decided to be secretive about their knowledge, since they were not deriving any economic benefits from those who were exploiting their IK (Eyong, n.d.).A study conducted in Jara town, South-east Ethiopia revealed that, 96.3% of the respondents were aware of traditional medicine, 43.91% intended to use it in the future, 54.61% believed that traditional medicine is more efficacious in treating some diseases than modern medicines, 63.6% believed it is very safe while 39.85% had a positive attitude towards the medicine, 50.18% accepted the practice of traditional health, while 73.8% had applied it at least once (Mohammed, Kasso and Demeke, 2016).

A study conducted by Aragaw, Afework and Getahun (2020), revealed that traditional health practitioners have some negative attitude to the documentation of IK, as the majority 53.2% still believed the knowledge has to be kept secret to preserve its potency. This is most likely to be a fallacy, the traditional health practitioners may be propagating the assertion, because of the economic benefits they derived from their IK. Some traditional health practitioners want to continue to make money from their IK, hence engaged in some fallacious statement such as, "secrecy is the power of IK, which must not be broken and that payment is part of the holistic treatment." They want to continue to enjoy the economic benefits accruing to them from their knowledge in which documentation will make the knowledge open and people may not see the need to consult them. This may like be an economic threat to the traditional health practitioners and their dependents.

Traditional health practitioners in Southern Ethiopia have positive attitude to the documentation of IK. Kebebew and Mohamed (2017) in their study found that the traditional healers were cooperative while documenting the IK of the people in Lemo Woreda. The study found that fifty-four species of medicinal plants belonging to thirty-eight general and twenty-nine families for treating livestock and human diseases ailments were documented. Out of which twenty-three were cultivated, twenty of them were wild, the most useful components of plant were leaf 22 (40.74%) followed by barks 7 (12.96%).

The widely use method of preparation is crushing about 27 (43.55%) oral administration is the best way to administer them 39 (72.22%). The study further revealed that, the deforestation and overgrazing were the major threat to medicinal plants, obnoxious practices such as bush burning and indiscriminate felling of trees should not be encouraged to conserve natural vegetation for the benefit of man and the animal. In another study conducted by Khan, Ahmad and Rashid (2018) in the Talash Valley of Dir Lower, Northern Pakistan, revealed the positive attitude to representation of IK by the traditional health practitioners.

Knowledge holders in some cases understand the significance of their IK and the need to preserve through documentation, if only the grey areas could be resolved. The attitude of IK holders, when approached by people who are not a fellow practitioner or their patrons, are usually that of suspicion. Traditional health practitioners may even be thinking they are out to spy on them and possibly get them arrested. Proper collaboration will change the attitude of knowledge holders positively to make documentation of IK successful. To achieve the desired result, it cannot be left in the hands of the knowledge holders alone, librarians have to be actively involved. Ebijuwa (2015) submitted that librarians have been paying lip services by talking and writing about documentation without practical effort. This may be attributed to the kind of librarianship handed over to Nigerians by the colonial educational system; that concerned with the acquisition of materials that have to do with western knowledge without minding the oral information. A study conducted by Alabi, Oyelude and Sokoya (2019) revealed that when the library is ready to educate and work closely with an indigenous community, much of the IK going into extinction could be salvaged through documentation.

In a study conducted by Abiolu (2018), eighteen IK practitioners participated in the study out of which 72.2% were women as against 27.8% respondents who were men. The age of 78% of the respondents was above 40 years with 55.6% having tertiary education. The study was able to identify forty-four plant species used by herbalists, comprising eighty-two general and ninety-six species. The practitioners that participated in the study showed positive attitude to recording their IK, they support using modern ICT equipment to document their knowledge, even though

they were not engaging in traditional health . In Oyo State, Nigeria, traditional health practitioners are documenting their IK by writing in books, audio recording, videotaping, drawing, photographing and storytelling (Ebijuwa and Mabawonku, 2015). They were asked whether their IK was documented or not, majority 72.2% indicated that it was largely undocumented. Little efforts by the information professionals to increase their interest and arouse their consciousness to the documentation of IK will yield the desired results. These studies revealed that when the librarians and other documentalists can assure the IK holders that they are not out to steal their knowledge, but rather help them to preserve their IK for both the present and future benefits. Their attitude towards documentation may likely be positive. The responses of some women interviewed, was a testimony to this fact. They expressed their wiliness to support documentation of their IK, provided the librarians were willing to work with the women leaders in the market, ready to show financial commitment by paying the agreed fees and ensure the protection of their intellectual property, right after documentation to guarantee the sustenance of the source of their livelihood. They indicated that they were ready to participate in the documentation exercise subject to the stipulated conditions.

Methodology

This study adopted a descriptive research design of the correlational type. The population comprises 3,850 traditional healthcare practitioners in South-West, Nigeria, which are Ekiti, Ondo, Osun, Oyo, Ogun and Lagos states.

Table 1: Population of Traditional Health Practitioners in South-West, Nigeria

State	Population
Ekiti	400
Lagos	2000
Ogun	150
Ondo	200
Osun	500
Oyo	600
Total	**3850**

Source: National Association of Traditional Health Practitioners of Nigeria.

Traditional health practitioners, comprise herbalists, midwives, bonesetters, birth attendants and traditional psychiatrists. The sample size of this study is 362 respondents; Yaro Yemane (1967) formular for calculating sample size was used to determine the sample size of 362 respondents. The study employed proportional random sampling technique to select 38 traditional health practitioners from Ekiti State, 19 from Ondo State, 47 from Osun State, 56 from Oyo State, 14 from Ogun State and 188 from Lagos State, based on the population of practitioners from each state. Purposive sampling technique was used to select traditional health practitioners to participate in the study rather than other IK holders. A Traditional health practitioner plays a crucial role in primary health care, most especially in rural communities, where the medical facilities available may be grossly inadequate, and at times, the rural dwellers may not be able to afford the cost of the health care thereby depending of traditional health practitioners of their health needs.

The questionnaire, the instrument for data collection, was divided into 3 main sections: Section A consists of nine items, which deal with the demographic variables of the respondents. Section B comprises fifteen items on the attitude to documentation of indigenous knowledge. Section C contains items on documentation of indigenous knowledge. The reliability of the instrument was established through Cronbach's Alpha statistical test. In order to determine the internal consistency of the instrument, a pilot study was carried out among thirty (30) traditional health practitioners in Ekan, Kwara State, which is outside the study area. The instrument was pre-tested by administering the scale on 30 traditional health practitioners and the result obtained were subjected to Cronbach-Alpha statistical test. The scale for attitude to documentation of indigenous knowledge (r=0.80) while scale for the documentation of indigenous knowledge yielded (r=0.88). The simple statistics of descriptive distribution, tabulation and charts were employed for the demographic variables. The research question was answered, using simple percentage and frequency count, mean and standard deviation. Pearson Moment Correlation Analysis was used to test hypothesis at 0.05 level of significance.

Data Presentation and Analysis

Demographic Variables of the Respondents

Table 1: Demographic information of the respondents

ITEM	FREQUENCY	PERCENTAGE(%)
Gender		
Male	265	73
Female	97	27
Total	**362**	**100**
Age Range	**Frequency**	**%**
21-30 years	6	2
31- 40 years,	155	43
41-50 years	37	10
51-60 years	164	45
Total	**362**	**100**
Marital Status	**Frequency**	**%**
Single	8	2
Married	354	98
Total	**362**	**100**
Years of Experience	**Frequency**	**%**
5-14 19	5	
15-24	65	18
25-34	148	41
35years and above	130	36
Total	**362**	**100**
Educational Qualification	**Frequency**	**%**
Primary Education	98	27
Secondary Education	152	42
Tertiary Education	35	10
No formal Education	77	21
Total	**362**	**100**
Areas of Specialisation	**Frequency**	**%**
Herbalist	177	49
Traditional Midwives	64	18
Bonesetters	23	6
Birth attendants	44	12
Spiritualist	17	5
Traditional Psychiatrists	37	10
Total	**362**	**100**

Research question : What is the attitude of traditional health practitioners to documentation of indigenous knowledge in South-West, Nigeria?

Table 2: Attitude of the Respondents to Documentation of Indigenous Knowledge

S/N	*ITEMS*	*SA*	*A*	*N*	*SD*	*D*	Mean	Std. Dev.
1	I have a record of my indigenous practice	158 43.6%	100 27.6%	3 0.8%	93 25.7%	8 2.2%	3.85	1.29
2	The knowledge is from our fathers and must not be written down	21 5.8%	54 14.9%	9 2.5%	259 71.5%	19 5.2%	3.56	1.00
3	Writing our indigenous health practices will make other people to have access to it	37 10.2%	48 13.3%	14 3.9%	245 6.7%	18 5.0%	2.56	1.11
4	Documenting alternative health care knowledge will make us lose our customers	9 2.5%	36 9.9%	15 4.1%	249 68.8%	53 14.6%	3.83	0.89
5	Alternative health care knowledge was transferred to me by my forefathers and other people must not know about it	12 3.3%	51 14.1%	8 2.2%	265 73.2%	26 7.2%	3.67	0.92
6	It is a taboo to document the knowledge I am using to alternative healthcare	30 8.3%	100 27.6%	18 5.0%	191 52.8%	23 6.4%	3.21	1.16
7	The medicine will not work if people are exposed to the knowledge	23 6.4%	90 24.9%	22 6.1%	196 65.1%	31 8.6%	3.34	1.13
8	It is important to document alternative healthcare knowledge	157 43.4%	110 40.4%	4 1.1%	73 20.2%	18 5.0%	3.87	1.30
9	Lack of documentation has led to loss of practices use by our fore fathers to cure illness	46 12.7%	121 33.4%	12 3.3%	175 48.3%	8 2.2%	3.06	1.19
10	I feel comfortable writing down my alternative healthcare knowledge	61 16.9%	144 39.8%	11 3.0%	134 37.0%	12 3.3%	3.30	1.22
11	I always want others to know the knowledge I am using for my practice	191 52.8%	109 30.1%	9 2.5%	46 12.7%	7 1.9%	4.19	1.11
12	The knowledge was handed over to me orally and that is how I will hand it over to my children	42 11.6%	99 27.3%	12 3.3%	195 53.9%	14 3.9	2.89	1.19
13	There is an urgent need to document indigenous knowledge to prevent it from extinction	134 37.0%	167 46.1	13 3.6%	40 11.0%	8 2.2%	4.05	1.02
14	Indigenous knowledge is not relevant today and there is no need for documentation	13 3.6%	49 13.5%	16 4.4%	272 75.1%	12 3.3%	3.61	0.89
15	Modern methods such as tape recording, video, databases among others should be used to document our indigenous knowledge.	86 23.8%	194 53.6%	7 1.9%	68 18.8%	7 1.9%	3.78	1.07

Source: Field Survey

Table 2 revealed that traditional health practitioners always want others to know about their knowledge ranked highest by the mean score (mean =4.19) rating. Followed by the urgent need to document IK to prevent it from extinction (mean=4.0). Followed by it is important to document alternative health care knowledge (mean=3.87). I have a record of my IK practice (mean=3.85), documenting alternative healthcare knowledge will make us lose our customers (mean=3.83), modern methods such as tape recording, video, databases among others should be used to document indigenous knowledge (mean=3.78), alternative health care knowledge was transferred to me by my forefathers and other people must not know about it (mean=3.67), indigenous knowledge is not relevant today and there is no need for documentation (mean=3.61), the knowledge is from our fathers and must not be written down (mean=3.56), the medicine will not work if people are exposed to the knowledge (mean=3.34), I feel comfortable writing down my alternative healthcare knowledge (mean=3.30), it is a taboo to document my alternative healthcare knowledge (mean=3.21), the knowledge was handed over to me orally and that is how I will hand it over to my children (mean=2.89) and writing our indigenous health practices will make other people to have access to it (mean=2.56).With a cut-off mean of 3.00 for the rating scale, all the items had mean scores above 3.00 except Items 3 and 12. This implies that the traditional health practitioners in the South-West, Nigeria have positive attitudes to documentation of their indigenous knowledge.

Research Hypothesis

This section reports the results of the null hypothesis tested at 0.05 level of significance to draw salient inferences in this study.

Hypothesis: There is no significant relationship between attitude and documentation of indigenous knowledge by traditional health practitioners.

Table 3: Correlation between Attitude and Documentation

Correlations			
		Attitude	Documentation
Attitude	Pearson Correlation	1	.551**
	Sig. (2-tailed)		.000
	N	362	362
Documentation	Pearson Correlation	.551**	1
	Sig. (2-tailed)	.000	
	N	362	362

The correlation of r=0.551 shows that there exist a positive correlation between attitude towards documentation of indigenous knowledge and documentation of indigenous knowledge. Attitude towards documentation of indigenous knowledge has a significant relationship with documentation of indigenous knowledge ($p<0.05$). Table 3 presents the correlation between attitude and documentation of IK. The result shows that the computed R-value (0.551) with a p value < 0.05 was significant at 0.01 level. The null hypothesis is not accepted.

Discussion of the Findings

The first objective of the study was to examine the attitude of traditional health practitioners to the documentation of IK in South-West, Nigeria. The findings revealed that traditional health practitioners in South-West, Nigeria have a positive attitude to the documentation of their IK. They want others to know about their IK and they agreed that IK needed to be documented urgently to prevent it from going into extinction. It further revealed that some of the traditional health practitioners have records of their IK. The findings of this study also corroborate the study of Isaa, Owoeye and Awoyemi (2018) which revealed that traditional health practitioners in Kwara State, Nigeria have a positive attitude to the documentation of IK.

This is also corroborated by an earlier study of Alabi, Oyelude and Sokoya (2019) that revealed

that, when the library is ready to educate and work closely with the indigenous community, much of the IK going into extinction could be salvaged through documentation. Lazarus, Unegbu and Opeke (2019) while elucidating on the benefits of documenting IK submitted that proper documentation of IK will help in dissemination, preservation and protect it from exploitation of those who are not the original owners. The holders of indigenous knowledge of textile craft making (adire) in Ogun-State, South-West, Nigeria have a positive attitude to IK documentation. Similarly, a study conducted by Abiolu (2018) found that the traditional health practitioners that participated in the study showed a positive attitude to documentation of their knowledge of traditional medicine even though they were not practising it. They were asked whether their IK was documented or not. The majority indicated that it was largely not documented. Little efforts by the information professionals to arouse their consciousness to the documentation of IK may likely yield the desired results.

Some studies conducted outside Nigeria supported the findings of this study. The finding of Kebebew and Mohammed (2017) conducted in Southern Ethiopia corroborates the finding of this study. Traditional health practitioners in the study have a positive attitude to the documentation of their IK. They were cooperative in documenting medicinal plants used by the people for their healthcare. Similarly, the study of Khan, Ahmad and Rashid (2018), discovered that the traditional health practitioners in Northern Pakistan, have a positive attitude to the documentation of IK most especially the knowledge of medicinal plants. They were able to identify fifty herbs species belonging to thirty-three botan-ical families and forty-six general, in the seventeen villages.

However, the finding of this study contradicts that of Panneer, Ezhumalai, Vijayaragavan, Senthilkumar, Samydurai, Saradha and Praveen (2017) whose study revealed that the Irular tribe of Nilgiri District, Tamilnadu_India, have a negative attitude to the documentation of their knowledge of the medicinal plant. They wanted to preserve their recognition in society by retaining the monopoly of their traditional healing power by not documenting their knowledge. Similarly, a study conducted by Aragaw, Afework and Getahun (2020) revealed that traditional health practitioners in North-central Ethiopia have a negative attitude to the documentation of IK. The reason attributed to their negative attitude is the fear of losing their source of livelihood and that payment is part of the treatment, documentation will make their knowledge available free of charge.

Scholars such as Uche-Nwachi and McEwen (2010), Homsy, King and Tenywa (2003) gave some insights into while the attitude of some traditional health practitioners may be negative towards documentation of their IK. They posited that when their knowledge is considered uncommon, they tend to be very secretive about it most especially when that kind of knowledge resides among few traditional health practitioners and are not commonly known hence, documenting such becomes difficult and impossible. Few traditional health practitioners that are privy to such IK use it to generate income for themselves. They will not want such knowledge documented to preserve the source of their livelihood.

The nature of some African traditional medicine is responsible for the unfavourable attitude to the documentation of IK. In Africa, some health challenges are considered emotional and spiritual, which cannot be handled by orthodox medicine or by any traditional health practitioners, who are not experts in such area, they make use of the knowledge to generate money for themselves and also want to perpetuate the knowledge within their family circle. Mbogo (2009) expressed the view that traditional health practitioners have been preventing government agencies and medical doctors from knowing the key elements of their medicines to prevent stealing their IK thereby hindering them from making the needed money from traditional health practice. In some African countries, insanity is exclusively counted as the spiritual problem that rather requires spiritual psychotherapy by the traditional health practitioners, hence the traditional healers will never allow such knowledge to be documented (Galabuzi, 2010).

The positive attitude of traditional health practitioners to the documentation of IK could be ascribed to the level of literacy in South-West, Nigeria. The number of educated people in the South-West, Nigeria is very high. School enrolment at all levels is almost becoming a tradition. Society sees it as a custom for children at their elementary stages to attend schools as part of their developmental

processes. The significant roles played by some South-West leaders, such as late sage Chief Obafemi Awolowo who introduced free education into the old Western Region when he was the Premier of the Western region made South-West people to be largely educated. He also established the University of Ife in Nigeria, which gave opportunities for many indigent people to attain higher education. Missionaries who came during the colonial era contributed to the development of education in the region, as they introduced Christianity to the people, they also established mission schools that afford their faithful to send their children to school.

According to Functional Attitude Theory, people will show a positive attitude to things that benefit or reward them, and negative attitude to things that will inflict them with pains. Traditional health practitioners will never encourage documentation of their knowledge and even when they document, they will want it to be within their family circle if there are no compensations for them or ways of protecting their knowledge from biopiracy. Hence, safeguarding the intellectual property right of the knowledge holders is important to encourage them to show a positive attitude towards documentation of their IK.

The findings showed that there is a significant relationship between attitude and documentation of indigenous knowledge. The finding of this study further strengthens the position of Lwoga, Ngulube and Stilwell (2010) that attitude, culture and demographic variables affect documentation of IK. The results of the findings revealed that when traditional health practitioners have positive attitude towards documentation, they are most likely going to document their IK while negative attitude will make the knowledge holder not document even when there are opportunities to do so. Some traditional health practitioners are very secretive about their knowledge to those who were not members of their family and, their female children fearing that they would share the secrets with the other families after marriage. The reason for this, is majorly to protect the means of their livelihood, they are afraid that when their knowledge is documented, they may not be consulted again by their client. As part of their protective strategies, when documenting, they usually skip some of the materials so that it will not work without their consultation, as revealed by the practitioners during the fieldwork. The finding of this study corroborates the earlier findings of Issa, Owoeye and Awoyemi (2018) that there was a significant relationship between attitude and documentation of IK by the traditional health practitioners in Kwara State, Nigeria. The study revealed that there is no significant relationship between gender and documentation of IK. This contradicts the submission of Caudillo-Felix (2012) that women are so rich in IK due to their interactions with nature in their bid to meet the needs of their families. The World Bank also submitted that response by male and female to IK related issues differs.

Conclusion

The study concluded that, traditional health practitioners in South-West, Nigeria are positively disposed to documentation of IK; they want their indigenous knowledge documented. Any effort geared towards documentation of the indigenous knowledge of traditional health practitioners in South-West, Nigeria, is most likely going to yield the desired results due to the favourable disposition of the traditional health practitioners in this region.

Recommendations

Based on the finding of this study, the following recommendations were made:

i. Traditional health practitioners should be trained on how to document their indigenous knowledge

ii. Librarians and documentalists in South-West, Nigeria should commence documentation of the IK of traditional health practitioners because of their positive attitude to documentation.

iii. Librarians in public libraries should partner with the knowledge holders, to document and preserve their indigenous knowledge for the present and future benefits.

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