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Digital Literacy and Competence in Post-Covid-19 Era: An Empirical Investigation of Academic Librarians in Federal Universities in the Niger-Delta Region of Nigeria

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A B S T R A C T

This study investigated the level of digital literacy and digital competence of academic librarians in Federal universities in the Niger Delta Region of Nigeria. Questionnaire and a structured interview were used for data collection. Total enumeration technique was adopted as the study population of 170 was not large. Results showed that most respondents admitted to possessing the ability to operate new technologies such as smart mobile phones easily (x^{-}=2.75; std dev. =.860) while a preponderance of the respondents indicated that they were not able to modify and build on existing openly licensed resources where this is permitted (x^{-}=1.91; std dev. =.959). It was also revealed that the level of digital literacy and digital competence of academic librarians in Federal universities in the Niger-Delta region of Nigeria is moderate. Most academic librarians identified sponsored trainings (x^{-}=2.78; std dev. =.818) and personal trial and error (x^{-}=2.56; std dev. =.944) as the major methods of acquiring digital literacy and competence. The major challenges that hinder acquisition of digital literacy and competence as identified by the respondents include inadequate funding (x^{-}=2.77; std dev. =.956) and network bandwidth in the library (x^{-}=2.61; std dev. =.932). The study recommends, among others, that academic librarians need to be intentional about the provision of digital services in libraries by acquiring various digital skills and competencies to be effective in this era.

Keywords: Digital literacy, Digital competence, Universities, librarians, Niger-Delta, Nigeria

1. Introduction

The influence of COVID-19 pandemic has been remarkable in the world and has shown its effects significantly on various fields including education. It has ushered in a new era for universities, librarians and students. The pandemic has necessitated, like never before, the adoption and use of various digital technologies for online information services and learning activities by academic librarians throughout the world, including Nigeria. However, libraries in this present era characterised by unprecedented technological developments, require librarians that can blend digital and technological skills with traditional information dissemination expertise. The spread of digital technologies in all aspects of life and the changes they have brought has caused a change in the expectations from academic librarians and other information professionals who are busy with information provision and dissemination in Nigeria. Central to these expectations is the need for librarians in Nigeria to be proficient in the use of various technologies in libraries to provide information and support the use of diverse information resources by the patrons in all formats (Yurtseven, Sarac and Akgun, 2021). Thus, meeting these expectations is possible when librarians possess digital literacy and competence.

The term digital literacy is defined as the ability to search, find, organize, evaluate and analyze information using digital technology (Direkci et al., 2019). Kozan and Bulut Ozek (2019) also viewed digital literacy as a prerequisite for cognitive activity that allow effective use of digital technologies. This is to say that academic librarians who possess digital literacy skills can synthesize available knowledge in the library as well as the knowledge they acquired through technology correctly and present this knowledge in a digital form to users. In this respect, digital literacy can help librarians to execute various digital services successfully in libraries, communities and parent institutions (Joosten & Cusatis, 2020). Thus, a digitally literate librarian has enough knowledge to determine access, manage, analyze and properly use digital sources.

Meanwhile, digital competence is more sophisticated a skill than digital literacy. Amhag et al., 2019) stated that it involves the practical and critical use of the internet and digital technologies for information services and consists of the management of different digital devices and software in these devices. Similarly, the European commission, as noted by Vuorikari et al (2016), argue that digital competence involves the confident and critical use of ICT tools for work, leisure and communication. Therefore, digital competence for academic librarians includes critical skills in the use of digital tools in the library as well as the confidence to respond to technology-driven challenges faced in delivering library services. A digitally competent librarian prioritises information needs of the patrons and devises various technological means to satisfy their needs. This portrays the fact that academic librarians need

preparedness, training and practice considering the changes libraries continue to face in terms of services and functions, especially now that physical visit to libraries is now risky to both patrons and academic librarians due to Covid-19 pandemic.

As the use of technology in libraries continues to have overbearing influence on the extent in which librarians can access and use information (Song and Song, 2014), coupled with series of predictions by experts that other new infectious diseases will emerge in the future (Ten Cate et al (2021), it is crucial for academic librarians, especially in the Niger Delta Region of Nigeria to make effort to acquire digital literacy through training as well as digital competence through continuous usage to remain relevant. The Niger Delta Region (NDR) of Nigeria also known as the oil producing region comprises of the nine (9) oil producing states in Nigeria which include Akwa Ibom, Rivers, Edo, Cross Rivers, Bayelsa, Delta, Abia, Imo and Ondo. The region is christened the Niger Delta due to its oil producing status and it currently produces 100% of the crude oil which is the major revenue in Nigeria. The Niger Delta region of Nigeria occupies about 70,000kmsq of Nigeria landmass accounting for about 7.5% land area in Nigeria. However, all the all the states in the region have federal universities supported by functional libraries established by the federal government of Nigeria to cater for educational and information needs of the region. Each of the university libraries are maned by academic librarians who are trained to select, organize and disseminate information in all formats including digital formats, to aid teaching, learning and research by patrons without bias. Hence, it is envisaged that this study will make timeous empirical contributions on digital literacy and digital competence of academic librarians in the Nigeria Delta region of Nigeria in light of the COVID - 19 pandemic that has further catalysed the need for librarians to be digitally literate and competent to effectively serve the users.

1.1 Statement of the Problem

COVID-19 pandemic has made digital literacy and competence a viable option for academic librarians. Literature has revealed that library services in Nigeria have been grossly affected due to the pandemic like never before. The pandemic has exerted an unprecedented pressure on Nigerian university libraries such that the provision of information services now requires librarians to adjust to new conditions such as digital service provision to be able cater for various patrons during and after the pandemic. Preliminary interactions with some librarians revealed that most academic librarians in the Niger Delta region are yet to fully acquire digital literacy and competence associated with information services provision. This has resulted in poor patronage of the university libraries across the region.

Thus, it is assumed that digital literacy and competence are a perquisite to engaging in digital library services and the level of digital literacy as well as competence of librarians will largely determine their effectiveness in the post COVID-era where digital services have become increasingly important in Nigeria. Despite this, studies to determine the extent to which academic librarians in Federal universities in the Niger Delta region possess digital literacy and competence was not found in the literature. To address this gap, this study aims to investigate the level of digital literacy and competence of academic librarians in selected federal universities in the Niger Delta region of Nigeria.

1.2 Objectives of the study

The main objective of this study is to investigate the level of digital literacy and digital competence of academic librarians in Federal universities in the Niger Delta Region of Nigeria. The specific objectives are to:

1. identify the types of digital literacy and competence possess by academic librarians in Federal universities in the Niger Delta Region?
2. determine the level of digital literacy and competence of librarians in Federal universities in the Niger Delta Region?
3. find out how librarians acquire the digital literacy and competence in Federal universities in the Niger Delta Region
4. ascertain factors that hinder acquisition of digital literacy and competence of academic librarians in Federal universities in the Niger Delta Region
5. determine the strategies of improving acquisition of digital literacy and competence by academic librarians in Federal universities in the Niger Delta Region

1.3 Research Questions

This study aims at answering the following research questions:

1. what are the types of digital literacy and competence possessed by academic librarians in Federal universities in the Niger Delta Region?
2. what is the level of digital literacy and competence of academic librarians in Federal universities in the Niger Delta Region?
3. how do academic librarians acquire digital literacy and competence academic in Federal universities in the Niger Delta Region?
4. what challenges hinder acquisition of digital literacy and competence by academic librarians in Federal universities in the Niger Delta Region?
5. how can the challenges be improved to facilitate digital literacy and competence of academic librarians in Federal universities in the Niger Delta Region?

2. Literature Review

Undoubtedly, the COVID-19 crisis has provided an impetus for Nigerian university libraries to rethink foundational issues, especially the need for librarians to become digitally literate and competent. According to Ten Cate et al, (2021), the global lockdown and widespread travel restrictions caused by the COVID-19 pandemic have led to the rapid growth and wide availability of digital technologies and this has greatly impacted the work of librarians, altering both library practices and services. A major reason why there is increased attention on digital literacy and competence of librarians (Ebiefung and Ebere, 2021). According to Song and Song (2014), digital literacy is a concept that has overbearing influence on the extent in which librarians can access and use information in their research and service provision. Digital literacy helps many organizations including libraries to carry out their activities remotely by moving the communication with staff and serve users beyond the physical library. In line with this submission, Yo, (2021) stated that the capacity to effectively serve users of the library by librarians in the covid-era, where most library services are online, will depend largely on the digital literacy and competence of librarians. This implies that for academic librarians to leverage adequately the digital information, they should be digitally literate.

Ebiefung and Ebere (2021) conducted a study of 321 information professionals in south-south, Nigeria to determine the types of digital literacy skills possessed and found that some of the potent digital literacy skills indicated by the respondents were multimedia searching of e-resources ($\bar{x}$=2.59; std dev. =.632); ability to search electronic sources with digital devices ($\bar{x}$=2.55; std dev. =.728); ability to evaluate a web page found online ($\bar{x}$=2.53; std dev. =.698); sharing online resources($\bar{x}$=2.49; std dev. =.662); using internet search engines to search information for academic work($\bar{x}$=2.39; std dev.=.699). This implies that digital literacy is a combination of different skills in the use of technology for information access and use. Consequently, for any librarian to become digitally literate, ability to search and retrieve information from multi-media sources as well as ability to evaluate digital information sources remain very critical. This agrees with study of Erol and Aydin (2021) who investigated the level of digital literacy of 188 Turkish teachers using four dimensions: Attitude, Cognitive, technical and social digital literacy and found that many respondents were able to use digital resources effectively which shows a high-level possession of digital literacy skills by Turkish teachers. This result could be attributed to the level continuous training and digital technology advancement in Turkey that has positively influence professionals to acquire digital literacy skills for effective services. The implication of this result is that it will difficult, if not impossible for librarian in Nigeria to justify the mandates of information service provision without adequate skills.

Studies have indicated that many librarians, to explore various information resources, have resorted to acquiring digital literacy and competence through various means. Subaveerapandiyan and Singh (2021) carried out an investigated to ascertain how 135 librarians in India learn about digital literacy. The study adopted a structured questionnaire as instrument of data collection. Findings revealed that most of respondents acquire digital literacy through websites (58.5%) and friends (51.1%). The findings showed that librarians are to constantly leverage various options to become digitally literate and competent. In relation to this, Nor (2021) noted that the integration of technology in libraries and its effectiveness will have much to do with how the librarian acquire digital literacy as well as technological competence, especially with the increased patronage of digital information sources by diverse users.

It is quite worrisome that despite efforts by academic librarians to leverage the existing technologies some factors continue to act as bottlenecks. This may have motivated Jibril et al (2018) to conduct a study to assess the factors that hinder the acquisition of digital literacy by librarians in Ahmadu Bello University, Zaria, Nigeria. Questionnaire was used as instrument of data collection. Majority 65 (82) of the respondents attributed their challenge to lack of adequate electricity supply in their campuses. This was followed by 60 (76%) who identified lack of digital facilities and network bandwidth as factors that hinder their acquisition of digital literacy skills. Most 57 (72%) of the respondents agreed that lack of funding also affect their digital literacy acquisition. This implies that acquisition of digital literacy, especially in universities is strongly tied to certain factors such as electricity supply and availability of digital facilities. The study recommended that the university management should provide enough digital facilities and ensure quick response to electric power outage in the library to foster acquisition of digital literacy among staff and students.

Furthermore, the revealed challenges also point to the need for effective strategies aim at enhancing digital literacy and competence of librarians. In line with this, Endouware and Yusuf (2021) investigated the strategies to enable academic librarians acquire digital literacy skills in university libraries in South south, Nigeria. The study adopted a descriptive survey design and questionnaire as the instrument of data collection. The study revealed that incentives from university administrators ($\overline{x}$ =3.1), developing interest by librarians ($\overline{x}$ =3.0) as well as subsidisation of digital literacy skills training (($\overline{x}$ = 2.7) in the universities were rank, respectively, as key factors. Similarly, Omoike and Oke cited in Mole (2017) suggested that in as much as the university management have the responsibility of training their staff, librarians also need to train themselves on use of digital technologies using available resources to remain relevant in this era. These strategies are very necessary, especially now that universities are facing enormous challenges birthed by the covid-19 pandemic where most librarians in the world can no longer physically and safely meet the patrons of the library without fear of contracting the coronavirus.

Gbaje (2007) noted that although the acquisition of online information resources is inevitable venture in 21st-century libraries, that should be preceded by efforts to increase digital competence of librarians. Digital competence is often misconstrued as being the same as digital literacy. It is worthy of note that digital competence of librarians is a more detailed form of digital skill than digital literacy. To be able to create or co-create new digital information resources for users has to do with digital competence. IIomaki and Lakkaka (2011) observe that digital literacy represents a person's ability to perform tasks effectively in a digital environment, whereas digital competence goes beyond mere ability to include confidence and critical use of digital tools for work. IGI Global (2021) explained that a librarian who is competent in performing digital services should have the capacity to respond to patrons' or societal demands and be able complete a more serious task using technology. This is to that digitally competent librarians may go beyond using

technologies (digital literacy) to being able to effectively protect sensitive digital content as well as organise digital content and make it available to different categories of library patrons. In line with this, Kayaduman and Battal (2020) argued that librarians need to prioritise the acquisition of digital competence, which is necessary in finding, understanding, evaluating, and applying information in various forms to solve personal, professional, community, regional, social, or even global problems.

Thus, literature has established digital literacy and digital competence are essential skills that academic librarians need to acquire to effectively serve users, especially now that covid-19 has made digital services very crucial. Literature have equally shown that digital literacy is a combination of different related skills and the possession of such skills could make libraries and librarians more effective. It was also found in the literature that several factors may also hinder acquisition of digital literacy skills by librarians in Nigeria and that various strategies need to be adopted in the universities to curb the situation. Thus, no literature indicated the level of digital literacy and competence of librarians in universities in the Niger Delta region. This is the gap this study intends to fill.

3. Methodology

The research design adopted for this study is survey research design. Purposive sampling techniques was adopted for the study. The population comprises of all academic librarians in 6 selected federal universities in the Niger Delta Region of Nigeria namely: Federal university, Otuoke (FUO) library, Maritime University Library MUL, Efferun, University of Uyo (UNIUYO) library, University of Benue (UNIBEN) library, University of Calabar (UNICAL) library and University of Portharcourt (UNIPORT) library. Total enumeration technique was used as total population of academic librarians was a manageable size of 170. Questionnaire was the main data collection instrument and a structured interview was used to complement data collected through the questionnaire. The stipulated period for data collection was two months with the help of two research assistants from each of the selected universities. Data collected was analysed in tables, using simple percentages, mean and standard deviation. A criterion mean value of 2.5 and above was used to accept a response as positive while the values of less than 2.5 will be rejected as negative. The data collected through interview was also analysed in line with the 5th research question.

Table 1. Population distribution and response rate of the respondents

S/N	Selected Schools	Distribution	Returns (%)
1.	Federal university, Otuoke	21	18(85.7%)
2.	Federal University of Petroleun Resources, Efferun (FUPRE)	41	39(95.1%)
3.	University of Uyo (UNIUYO) library	23	20(86.9%)
4.	University of Benue (UNIBEN) library	29	26(89.6%)
5	University of Calabar (UNICAL) library	30	28(93.3%)
6.	University of Portharcourt (UNIPORT) library	26	22(84.6%)
	Total	**170**	**153(90%)**

A total number of 170 copies of the questionnaire were administered to academic librarians in Federal Universities in the Niger-Delta region of Nigeria. 153 copies were returned and found useful for analysis giving a response rate of 90%. The response rate of the administered questionnaire is as shown in table 1. Majority of the respondents who participated in the study were from Federal university of Petroleum Resources.

4. Results and Discussion

Table 2: Gender of academic librarians in Federal universities in the Niger-Delta region of Nigeria

Gender	Frequency	Percentage (%)
Male	89	58.16
Female	64	41.83
Total	**153**	**100**

Table 2 showed the gender of academic librarians in Federal Universities in the Niger-Delta region of Nigeria. It was revealed that 89(58.16%) of the academic librarians are Male while 64(41.83%) are females. This imply that majority of the respondents are males.

Table 3: Marital status of academic librarians in Federal universities in the Niger-Delta region of Nigeria

Marital status	Frequency	Percentage (%)
Single	53	34.64
Married	97	63.39
Divorced	3	1.96
Total	**153**	**100**

Table 3 showed the marital status of academic librarians in Federal Universities in the Niger-Delta region of Nigeria. It was revealed that 97(63.39%) of them are married; 53(34.64%) are single while 3(1.96%) are divorced. This imply that majority of the academic librarians studied are married.

Table 4: Highest educational qualification of academic librarians in Federal universities in the Niger-Delta region of Nigeria

Highest educational qualification	Frequency	Percentage (%)
OND/NCE/Diploma	-	-
HND	-	-
First degree	-	-
PGD	-	-
Masters	140	91.5
Ph.D	13	8.49
Total	**153**	**100**

Table 4 showed the highest educational qualification of academic librarians in Federal Universities in the Niger-Delta region of Nigeria. It was revealed that 140(91.5%) of the respondents are Masters' degree holder while 13(8.49%) are Ph. D holders. This imply that majority of the respondents are Masters' degree holders.

Research Question one: What are the types of digital literacy and competence possessed by academic librarians in Federal universities in the Niger Delta Region.

Table 5: Types of digital literacy and competence possess by academic librarians in Federal universities in the Niger-Delta region of Nigeria

	Digital literacy	SA	A	D	SD	$\bar{x}$	St. D	Decision
1.	I use electronic mailing in performing library services	18 (11.8%)	73 (47.7%)	34 (22.2%)	28 (18.3%)	2.52	.925	Accepted
2.	I can operate new technologies such as smart mobile phones easily	25 (16.3%)	82 (53.6%)	29 (19%)	17 (11.1%)	2.75	.860	Accepted
3.	I am confident with my search and evaluative skills in regards to obtaining information from the web	32 (20.9%)	46 (30.1%)	52 (34%)	23 (15%)	2.56	.985	Accepted
4.	I can effectively find and retrieve information from a wide range of digital sources	30 (19.6%)	35 (22.9%)	69 (45.1%)	19 (12.4%)	2.49	.946	Rejected
5.	I frequently obtain help from colleagues over the internet e.g through whatsapp, facebook, blogs	27 (17.6%)	66 (43.1%)	51 (33.3%)	9 (5.9%)	2.72	.821	Accepted
6.	I can disseminate information to users online using multi-media sources	23 (15%)	48 (31.4%)	47 (30.7%)	35 (22.9%)	2.38	1.000	Rejected
	Digital competence							
7.	Able to respect and correctly apply privacy and copyright rules.	16 (10.5%)	46 (30.1%)	74 (48.4%)	17 (11.1%)	2.39	.821	Rejected
8.	Able to effectively protect sensitive digital content	32 (20.9%)	44 (28.8%)	52 (34%)	25 (16.3%)	2.54	.999	Accepted
9.	Able to organise digital content and make it available to different categories of library patrons	29 (19%)	43 (28.1%)	55 (35.9%)	26 (17%)	2.49	.987	Rejected
10.	Able to understand the use and creation of open licenses and open educational resources, including their proper attribution.	23 (15%)	27 (17.6%)	68 (44.4%)	35 (22.9%)	2.24	.975	Rejected
11.	Able to create or co-create new digital information resources.	12 (7.8%)	43 (28.1%)	76 (49.7%)	22 (14.4%)	2.29	.810	Rejected
12.	Able to modify and build on existing openly-licensed resources and other resources where this is permitted	14 (9.2%)	22 (14.4%)	54 (35.3%)	63 (41.2%)	1.91	.959	Rejected
	Grand mean						**26.76**	

Table 5 showed the types of digital literacy and competence possess by academic librarians in Federal universities in the Niger-Delta region of Nigeria. While respondents agreed that they can operate new technologies such as smart mobile phones easily ($\bar{x}$ =2.75; std dev. =.860), most 69 (45.1%) respondents disagreed that 'they can effectively find and retrieve information from a wide range of digital sources' ($\bar{x}$ =2.49; std dev.=.946). Further analysis of the digital competence of the respondents revealed that the digital competence possess by a preponderance of the respondents was ''not

significant'' as a preponderance of the respondents 'disagreed' on being able to respect and correctly apply privacy and copyright rules ($\bar{x}$ =2.39; std dev.=.821) and organise digital content and make it available to different categories of library patrons ($\bar{x}$ =2.49; std dev.= 987).

From the results, it can be concluded that while some librarians are digitally literate, majority are not digitally competent. This result is quite expected as digital competence seem to be more complex than digital literacy. The implication of this result is that many librarians are still finding it difficult to use digital devices confidently and critically to effectively service various users of the library. Therefore, librarians who need to maximally function as reliable information are expected to make effort to become digitally competent because as Yo, (2021) rightly opined, the capacity to effectively serve users of the library by librarians in the covid-era and beyond will depend largely on the digital literacy and competence of librarians. This finding also, in part, supports the findings of Ebiefung and Ebere (2021) who conducted a study in south-south, Nigeria to determine the types of digital literacy skills possessed by 321 information professionals and found that some of the potent digital literacy skills indicated by the respondents were multimedia searching of e-resources, ability to search electronic sources with digital devices and ability to evaluate a web page found online.

Research Question two: What is the level of digital literacy and competence of academic librarians in Federal universities in the Niger Delta Region?

Table 6: Level of digital literacy and digital competence of academic librarians in Federal Universities in the Niger-Delta region of Nigeria.

	Items	**Highly proficient**	**Moderately Proficient**	**Lowly proficient**	**Not Proficient**	$\bar{x}$	**St. D**	**Decision**
	Digital literacy level							
1.	Using electronic mailing in performing library services	21 (13.7%)	70 (45.8%)	29 (19%)	33 (21.6%)	2.51	.980	Accepted
2.	Operating new technologies such as smart mobile phones, easily	30 (19.6%)	77 (50.3%)	39 (25.5%)	7 (4.6%)	2.84	.784	Accepted
3.	Confident with my search and evaluative skills in regards to obtaining information from the web.	21 (13.7%)	57 (37.3%)	62 (40.5%)	13 (8.5%)	2.56	.833	Accepted
4.	effectively finding and retrieving information from a wide range of digital sources.	15 (9.8%)	50 (32.7%)	69 (45.1%)	19 (12.4%)	2.39	.829	Rejected
5.	frequently obtaining help from colleagues over the internet e.g through whatsapp, facebook, blogs	27 (17.6%)	66 (43.1%)	51 (43.3%)	9 (5.9%)	2.72	.821	Accepted
6.	Disseminating information to users online using multi-media sources	19 (12.4%)	52 (34%)	41 (26.8%)	41 (26.8%)	2.32	1.004	Rejected
	Digital competence level							
1.	Ability to respect and correctly apply privacy and copyright rules	9 (5.9%)	53 (34.6%)	83 (54.2%)	8 (5.2%)	2.41	.683	Rejected
2	Ability to effectively protect sensitive digital content	18 (11.8%)	58 (37.9%)	50 (32.7%)	27 (17.6%)	2.43	.916	Rejected.
3	Ability to organise digital content and make it available to learners, parents and other educators	33 (21.6%)	39 (25.5%)	61 (39.9%)	20 (13.1%)	2.55	.972	Accepted
4.	Ability to understand the use and creation of open licenses and open educational resources, including their proper attribution.	10 (6.5%)	40 (26.1%)	68 (44.4%)	35 (22.9%)	2.16	.854	Rejected
5.	Ability to create or co-create new digital educational resources.	14 9.2%)	41 (26.8%)	66 (43.1%)	32 (20.9%)	2.24	.888	Rejected
6.	Able to modify and build on existing openly-licensed resources and other resources where this is permitted	5 (3.3%)	31 (20.3%)	74 (48.4%)	43 (28.1%)	1.98	.786	Rejected
	Grand mean					**29.11**		

Table 6 showed the level of digital literacy and digital competence of academic librarians in Federal universities in the Niger-Delta region of Nigeria. From the findings, majority of the academic librarians agree that they can operate new technologies such as smart mobile phones easily ($\bar{x}$ =2.84; std dev. =.784); while some also agreed that they are confident with their search and evaluative skills in regard to obtaining information from the web ($\bar{x}$ =2.56; std dev. =.833);

However, to establish the level of digital literacy and digital competence of academic librarians in Federal universities in the Niger-Delta region of Nigeria a test of norm was conducted. Results showed that scale between 1-16 is low digital literacy and competence; 16.1 - 32 indicates moderate digital literacy and competence, while 32.1 – 48 indicates high digital literacy and competence. The overall mean of digital literacy and digital competence of undergraduates is "29.11". It can therefore be concluded that the level of digital literacy and digital competence of academic librarians in Federal universities in the Niger-Delta region of Nigeria is moderate/average. This however, contradicts the study of Erol and Aydin (2021) who investigated the level of digital literacy of 188 Turkish teachers using four dimensions: Attitude, Cognitive, technical and social digital literacy dimensions and found that Turkish teachers possessed a high-level of digital literacy skills. The implication of this is that use of digital technologies by academic librarians still leaves much to be desired, especially now that Covid-19 has made provision of digital services very critical.

Table 7: Test of norm of level of digital literacy and digital competence of academic librarians in Federal universities in the Niger-Delta region of Nigeria

Interval	**Overall mean score**	**Remark**
1 – 16		Low level
16.1 – 32	**29.11**	Average level
32.1 – 48		High level

Research Question three: how do academic librarians acquire digital literacy and competence academic in Federal universities in the Niger Delta Region?

Table 8: How digital literacy and competence are acquired by academic librarians in Federal universities in the Niger-Delta region of Nigeria

Mode of acquisition	**SA**	**A**	**D**	**SD**	$\bar{x}$	**St. D**
Through library sponsored trainings	31 (20.3%)	65 (42.5%)	50 (32.7%)	7 (4.6%)	2.78	.818
Through self-sponsored trainings	25 (16.3%)	43 (28.1%)	64 (41.8%)	21 (13.7%)	2.47	.925
Through seminars organized by the library	14 (9.2%)	58 (37.9%)	46 (30.1%)	35 (22.9%)	2.33	.931
Through colleagues	12 (7.8%)	26 (17%)	79 (51.6%)	36 (23.5%)	2.09	.845
Through personal trial and error	29 (19%)	48 (31.4%)	56 (36.6%)	20 (13.1%)	2.56	.944
Grand mean					**12.23**	

Table 8 revealed how academic librarians acquire digital literacy and competence to enhance services in the library in Federal universities in the Niger-Delta region of Nigeria. Most academic librarians identified sponsored trainings ($\bar{x}$ =2.78; std dev. =.818) and personal trial and error ($\bar{x}$ =2.56; std dev. =.944) as the major modes of acquisition. The least method used by academic librarians is through colleagues ($\bar{x}$ =2.09; std dev. =.845). This imply that the major mode of acquiring digital literacy and competence to enhance services in the library is through library sponsored trainings and that librarians require trainings and continuous trial to be competent in the use of digital technologies in libraries. This also in line with the suggestion of Omoike and Oke cited in Mole (2017) that, even though universities have the responsibility to provide training opportunities for librarians, librarians are also expected to engage in self-sponsored trainings to stay relevant as information disseminators in this century.

Research Question four: What challenges hinder acquisition of digital literacy and competence by academic librarians in Federal universities in the Niger Delta Region?

Table 9: challenges that hinder the acquisition of digital literacy and competence by academic librarians in Federal universities in the Niger-Delta region of Nigeria

Challenges	**SA**	**A**	**D**	**SD**	$\bar{x}$	**St. D**
Cost of Digital skills trainings	34 (22.2%)	36 (23.5%)	40 (26.1%)	43 (28.1%)	2.39	1.120
Lack of digital facilities in the library	32 (20.9%)	54 (35.3%)	40 (26.1%)	27 (17.6%)	2.59	1.009
Network bandwidth in the library	21 (13.7%)	79 (51.6%)	26 (17%)	27 (17.6%)	2.61	.932
Absence of institutionalized trainings on the use of digital devices for information provision	12 (7.8%)	51 (33.3%)	67 (43.8%)	23 (15%)	2.33	.828
Inadequate funding	34 (22.2%)	72 (47.1%)	25 (16.3%)	22 (14.4%)	2.77	.956
Segregation in choosing who should go for training	36 (23.5%)	43 (28.1%)	43 (28.1%)	31 (20.3%)	2.54	1.063

Table 9 revealed the challenges that hinder the acquisition of digital literacy and competence as academic librarians in Federal universities in the Niger-Delta region of Nigeria. It was revealed that the major challenges include inadequate funding ($\bar{x}$ =2.77; std dev. =.956); network bandwidth in the library ($\bar{x}$ =2.61; std dev. =.932); lack of digital facilities in the library ($\bar{x}$ =2.59; std dev. =1.009); and segregation in choosing who should go for training ($\bar{x}$ =2.54; std dev. =1.063). The implication of this study is that also reported that any university library that intends to migrate from providing traditional to digital services must bagged up such ambitious venture with the acquisition of digital resources and consequent of training of librarians. This finding is in tandem with Jibril et al (2018) to conduct a study to assess the factors that hinder the acquisition of digital literacy and competence by

librarians and found that some respondents identified lack of digital facilities, network and inadequate funding as major constraints to acquisition of digital literacy in many university libraries in Nigeria.

Research Question five: How can the challenges be improved to facilitate digital literacy and competence of academic librarians in Federal universities in the Niger Delta Region?

In attempt to complement data retrieved with questionnaire, Heads of Digital Services (HDS) in each of the six (6) university libraries were interviewed. The respondents were asked to suggest how to improve digital literacy and competences of librarians in their respective libraries. All the respondents 6 (100%) cited ‘‘constant training and retraining of librarians’’ in the use of digital technologies in libraries as a possible way to improve the digital literacy and competence of librarians, especially in the Niger Delta region of Nigeria. 5 (83.33%) of the respondents indicated that ‘‘provision of digital infrastructure’’ will enhance acquisition of digital literacy and competence of librarians. It was equally noted by all the six (6) respondents that ‘‘funding of libraries’’ can aid acquisition digital literacy and competence. This result is expected because possession of adequate skills requires expertise which can only be obtained through training and access to the right resources. This buttresses the position of Gbaje (2007) who noted that the acquisition of digital infrastructure can be very easy and beneficial to librarians when the university committed to such project. It can, therefore, be concluded that university libraries can improve digital literacy and competence of librarians through training, increased funding to libraries and provision of infrastructure.

5. Conclusion and Recommendations

Undoubtedly covid-19 has forced many libraries to provide digital services to users. The need for university libraries in Nigeria, particularly in the Niger Delta region to stay relevant in the post covid era has compelled academic librarians to acquire digital skills and competences. It is important for librarians to acquire various digital literacy while consciously working to improve their competences in the use of digital technologies for effective services in libraries. Based on the findings of this study, it will be difficult now, if not impossible for librarians to effectively serve library patrons without a considerable high level of digital literacy and competence. Academic librarians have cardinal responsibility to come up with different digital services targeted at ensuring adequate use of libraries by all patrons whether within and outside the library environment. Based on the findings of this study, the following recommendations are made:

1. Academic librarians need to be intentional about the provision of digital services in libraries by acquiring various digital skills and competencies to be effective in this era.
2. There has been a proliferation of various digital resources in libraries, in recent times, therefore, librarians in Nigeria, particularly in the Niger Delta should acquire and maintain a high level of digital literacy and competence as a prerequisite for effective service delivery.
3. University libraries should from time to time organize workshops and trainings targeted at equipping librarians with the necessary digital and competences.
4. Lack of digital facilities and inadequate funding have been identified in this study as a major challenge; therefore, university authorities should ensure adequate provision of digital facilities and funds to enhance the process in libraries.
5. This study has highlighted some specific strategies that could enhance digital literacy and competence of librarians. Academic librarians are expected to leverage the highlighted strategies such as engaging in personal training and retraining for effective use of digital resources in the covid-era and beyond.

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