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INFLUENCE OF TECHNOLOGY USE INDICATORS ON SERVICE DELIVERY OF LIBRARIANS IN PUBLIC UNIVERSITIES IN NORTH-CENTRAL NIGERIA

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Abstract
Library service delivery provides interaction between librarians and library users to satisfy their academic goals. However, studies have revealed a poor and not so effective library services which led to the dissatisfaction of users necessitating the need for alternative service. Studies have focused on ICT use without much consideration to technology use and its indicators (type, purpose and frequency of use). Therefore, the study investigated the influence of technology use indicators on service delivery of librarians in public universities in North-Central Nigeria. The study adopted the survey research design. The population comprised 274 professional librarians in public universities in North-Central Nigeria. A sample size of 274 was determined using total enumeration to select the respondents. A validated, structured questionnaire was used for data collection. Cronbach's alpha reliability coefficient for the variables ranged from 0.93 to 0.96. A return rate of 89.8% was achieved. Descriptive and inferential statistics were used to analyse the data. The findings revealed that Technology use indicators ($Adj.R^2 = 0.28$, $F(3, 245) = 31.94$, $p < 0.05$) had a significant influence on librarians' service delivery.

Keywords: Library, librarians, library management, service delivery, Technology use

Introduction

Service organizations could be seen as that part of the economy that create services instead of goods. Hence, the activities coming from the provider or rendered to anyone in need of it could be regarded as service delivery. Organizations have to measure how effective these services are because it is associated with how well or poorly the organizations are performing in relation to the services provided. As noted by Akanmidu (2021) and Gaitho (2017), service delivery refers to the process of providing and delivering a service to customer or clients. It involves the activities and steps taken to ensure that a service is delivered efficiently and effectively to meet the needs and expectations of recipients.

Onuoha and Chukwueke (2019) assert that service delivery in the library is a crucial component in evaluating the productivity and efficacy of librarians in academic libraries. University libraries are set up concurrently with the parent institution to assist the community's teaching, learning, and research efforts by offering timely and relevant information. The library accomplishes this purpose through gathering, organizing, preserving, and sharing information with the community and its parent organization. As a result, university libraries, according to Adeniran (2011), are service-oriented

businesses created to address the information demands of their customers by offering pertinent information resources and services. For Akanmidu (2021), library service delivery is divided into two main categories which are technical and customer services. Other scholars also believe that library services delivery can be divided into traditional and advanced categories.

Service delivery will be assessed using the indicators identified by Parasuraman et al. (1985), namely tangibility, reliability, responsiveness, assurance, and empathy. However, evidence from literature as noted by Agoh et al. (2021) has revealed low level of service delivery and these resulted from inadequate information materials, obsolete resources, epileptic power supply, poor funding, inadequate infrastructure, poor policies and facilities, inadequate operational systems and strategies for service delivery. Similar challenges may be facing the delivery of effective library services by librarians in public universities in North-Central, Nigeria. In view of these factors, this study examined the roles of technology use in improving or enhancing service delivery in public universities in North-Central in Nigeria.

Technology is defined as tools, methods, or accomplishments that make use of the most recent, advanced Information Technology (IT) breakthroughs (Hussain, 2019). Technology has been used in different facet of life such as in production/manufacturing industries, financial institutions, communication and media industries, education, law, library etc. For instance, technology can be seen as a powerful force that opens exciting opportunities for corporate organizations to achieve their missions and goals (Ade, 2020). The advent of technology as observed by Rawwash *et al.* (2020) has improved efficiency in the performance of routine tasks in the library. Technology has also been applied in the processes of teaching library users the rudiments of the library and to effectively utilize the library's resources. This takes place through the use of blogspots and other social networking sites to showcase the services of the library and inform the users on how these services can be harnessed. Technologies in libraries capture the various electro-mechanical devices used in information handling - from generation to dissemination (Nnadozie, 2016). According to Bhoi (2017), technology use has not only increased the ability to access, store, and process information within the library, but has brought great changes in the concept, organization and management of the library and information system. For this study, technology use will be measured in relation to the type of use, purpose of use and frequency of use.

Statement of the Problem

The major role of university librarians is to provide efficient and adequate service in support of the research, teaching and learning functions of their users. However, literature and observation have confirmed a low level of services being delivered in university libraries. This is a result of poor infrastructure, and technology in these libraries. Therefore; factors such as technology use by librarians may determine service delivery in public universities in North-Central Nigeria. In view of the fact that scholars have studied technology use indicators independently, there is a dearth of literature with

regards to the combined influence of technology use indicators on service delivery of librarians in North-Central public university libraries in Nigeria. It is on this premise that this study investigated the influence of technology use indicators on service delivery of librarians in North-Central public universities in Nigeria.

Objective of the Study

1. find out the perception of librarians' regarding service delivery in public universities in North-Central, Nigeria;
2. find out the use (type, purpose and frequency) of technology by librarians in public universities in North Central, Nigeria.

Research Questions

The following research questions were raised based on the objectives of the study:

1. What is the perception of librarians' service delivery in public universities in North-Central, Nigeria?
2. What are the uses (types, purpose and frequency) of technology of librarians in public universities in North-Central, Nigeria?

Hypothesis

The following null hypothesis was tested at 0.05 level of significance:

H01: Indicators of technology use will not have any influence on service delivery of librarians in public universities in North-Central, Nigeria.

Research Methodology

The study adopted a survey research design. The population for this study comprised professional librarians in all the federal and state universities in North-Central Nigeria. In North-Central Nigeria, there are 15 public universities comprising of eight (8) Federal Universities and seven (7) state universities with 274 professional librarians. The sample size for this study was determined with total enumeration. This was used because of the small size of the population of librarians.

A questionnaire titled "Technology use and service delivery" was used as the instrument for data collection. The questionnaire was divided into section B measured the extent of service delivery using a scale ranging from: Strong Agree (4); Agree (3); Disagree (2); Strongly Disagree (1). Section C contained items on technology use in the public universities using a scale with response ranging from Very High (4); High (3); Low (2); and Very Low (1).

It was validated for face and content validity by experts in the library and information science field. For the reliability of the instrument, the researcher conducted pilot study and the result of the Cronbach's Alpha test determined the reliability of the main constructs in the survey. Instrument-technology use and service delivery. The reliability test estimated the consistency of people's responses to the items within a scale and the value (<0.6) is adequate for the study (Hair et al, 2014). The Cronbach alpha

coefficient values for the variables were (Section B: Service delivery=0.96), and (Section C: Technology use Scale =0.93). The reliability results for the variables are all accepted for the study since their reliabilities are greater than 0.6, the minimum acceptable reliability for a research instrument.

The researcher administered the corrected copies of the questionnaire to the respondents in the study sample areas. The data collected was analysed using descriptive statistics such as frequency counts, percentages, the mean and standard deviation and inferential statistics analysed the research questions in this study. Regression analysis was used to establish the influence of the independent variable on the dependent variable. Analysis of the questionnaire was coded and analysed using the Statistical Package for Social Science Software (SPSS Version 25).

Result of Findings

Research Question One: What is the perception of librarians' service delivery in public universities in North-Central, Nigeria?

Table 1.0: Perception of Librarians' Service Delivery

Librarians' Service Delivery	Strongly agree (4)	Agree (3)	Disagree (2)	Strongly disagree (1)	Mean	Std.
Empathy					**3.47**	**0.532**
I give attention to users concerns.	135 (54.9%)	106 (43.1%)	5 (2.0%)	0	3.53	0.539
I treat users with respect	132 (53.7%)	113 (45.9%)	1 (0.4%)	0	3.53	0.508
I demonstrate understanding of specific needs	119 (48.4%)	125 (50.8%)	2 (0.8%)	0	3.48	0.516
I ensure that user's opinion is valued	113 (45.9%)	130 (52.8%)	3 (1.2%)	0	3.45	0.522
Librarians understand the users feelings	101 (41.1%)	133 (54.1%)	12 (4.9%)	0	3.36	0.574
Responsiveness					**3.43**	**0.521**
Librarians are always willing to help users	153 (62.2%)	91 (37.0%)	2 (0.8%)	0	3.61	0.504
I respond to users' information request with courtesy	103 (41.9%)	140 (56.9%)	3 (1.2%)	0	3.41	0.516
I ensure that users information needs are treated with utmost efficiency	100 (40.7%)	145 (58.9%)	1 (0.4%)	0	3.40	0.500
I respond to users request for information as expected	91 (37.0%)	153 (62.2%)	2 (0.8%)	0	3.36	0.498
I respond to users request within an acceptable time frame	96 (39.0%)	144 (58.5%)	2 (0.8%)	4 (1.6%)	3.35	0.585

Tangibles					**3.40**	**0.613**
I ensure neatness of the library environments for library users	165 (67.1%)	80 (32.5%)	0	1 (0.4%)	3.66	0.499
I arrange books on display racks for users' awareness	126 (51.2%)	110 (44.7%)	9 (3.7%)	1 (0.4%)	3.47	0.590
I ensure orderly arrangements of catalogue cards entries for users' access	110 (44.7%)	122 (49.6%)	5 (2.0%)	9 (3.7%)	3.35	0.701
I ensure that infrastructures are adequate for the library users	97 (39.4%)	133 (54.1%)	15 (6.1%)	1 (0.4%)	3.33	0.606
I provide up -to-date computer equipment for information retrieval	83 (33.7%)	130 (52.8%)	32 (13.0%)	1 (0.4%)	3.20	0.668
Assurance					**3.39**	**0.511**
I assure users access to available information resources	113 (45.9%)	131 (53.3%)	2 (0.8%)	0	3.45	0.515
I assure users of prompt delivery of information resources in requested format	111 (45.1%)	134 (54.5%)	1 (0.4%)	0	3.45	0.506
I assure users of the relevance of information provided	91 (37.5%)	155 (63.0%)	0	0	3.37	0.484
I assure that users are convenient with the service provided	91 (37.0%)	154 (62.6%)	1 (0.4%)	0	3.37	0.491
I assure that users have the needed knowledge to instill confidence in them	86 (35.0%)	150 (61.0%)	9 (3.7%)	1 (0.4%)	3.30	0.557
Reliability					**3.37**	**0.513**
I treat users' information needs promptly	117 (47.6%)	122 (49.6%)	7 (2.8%)	0	3.45	0.553
I provide sufficient information needs of users	111 (45.1%)	135 (54.9%)	0	0	3.45	0.499
I deliver users request as promised	109 (44.3%)	131 (53.3%)	6 (2.4%)	0	3.42	0.542
I deliver error-free information to users	70 (28.5%)	170 (69.1%)	6 (2.4%)	0	3.26	0.492
I speedily correct wrongly posted users information	69 (28.0%)	173 (70.3%)	4 (1.6%)	0	3.26	0.477
Grand Mean					**3.41**	**0.538**

Decision Rule: 1.0-1.74 = Strongly disagree; 1.75-2.49 = Disagree; 2.50-3.24 = Agree; 3.25-4.0 = Strongly agree

Table 1.0 presents the result on the perception of librarians on service delivery in public universities in North -Central, Nigeria. The table revealed that the librarians strongly agreed that service delivery was high with a grand mean of $\overline{x}$ = 3.41, SD = 0.538 on a 4-point Likert-type scale. This implies that the librarians deliver library services with empathy, responsiveness, reliable, tangible and with assurance. Going by the parameters measuring librarians' service delivery, the results revealed that empathy had the highest, which implies that their service delivery was good with an average mean of $\overline{x}$ = 3.47, SD = 0.537, while reliability had the lowest, which implies that their service delivery was not as good with an average mean of $\overline{x}$= 3.37, SD = 0.513.

Research Question Two: What are the technology uses (types, purpose and frequency of use) of librarians in public universities in North-Central, Nigeria?

Table 2.0 Technology Use by Librarians

Technology Used	Very High (4)	High (3)	Low (2)	Very low (1)	Mean	Std.
Tech Used						
Multimedia Projector	123 (50.0%)	100 (40.7%)	23 (9.3%)	0	3.81	0.583
Mobile Apps	115 (46.7%)	103 (41.9%)	18 (7.3%)	10 (4.1%)	3.77	0.636
Barcode Reader	66 (26.8%)	110 (44.7%)	28 (11.4%)	42 (17.1)	3.43	0.904
Blogs	74 (30.1%)	100 (40.7%)	40 (16.2%)	32 (13.0%)	3.41	0.912
RSS feeds	72 (29.3%)	92 (37.4%)	50 (20.3%)	32 (13.0%)	3.33	0.945
I-Pad	63 (25.6%)	100 (40.7%)	83 (33.7%)	0	3.33	0.948
QR Code	80 (32.5%)	80 (32.5%)	56 (22.8%)	30 (12.2%)	3.30	0.956
Live Streaming	67 (27.2%)	90 (36.6%)	49 (19.9%)	40 (16.3%)	3.28	0.963
RFID	76 (30.9%)	80 (32.5%)	45 (18.3%)	45 (18.3%)	3.27	0.965
Podcast	26 (10.6%)	97 39.4%)	100 (40.7%)	23 (9.3%)	3.00	1.002

Grand Mean					**3.39 Mean**	**0.881 Std.**
	Strongly agree (4)	**Agree (3)**	**Disagree (2)**	**Strongly disagree (1)**		
Purpose of Use					**2.96**	**0.900**
I use Multimedia Projector for presentation	108 (43.9%)	96 (39.0%)	38 (15.4%)	4 (1.6%)	3.25	0.773
I use mobile apps to offer digital library services to patrons	97 (39.4%)	121 (49.2%)	16 (6.5%)	12 (4.9%)	3.23	0.777
I use RSS feeds to subscribe to online content	97 (39.4%)	92 (37.4%)	34 (13.8%)	23 (9.3%)	3.07	0.952
I use i-pad to access online resources	72 (29.3%)	121 (49.2%)	36 (14.6%)	17 (6.9%)	3.01	0.848
I use Barcode Reader to check-in and check-out books	75 (30.5%)	103 (41.9%)	48 (19.5%)	20 (8.1%)	2.95	0.909
I use live streaming for orientation of new students	71 (28.9%)	106 (43.1%)	55 (22.4%)	14 (5.7%)	2.95	0.861
I use Blogs to disseminate information to patrons	70 (28.5%)	101 (41.1%)	53 (21.5%)	22 (8.9%)	2.89	0.921
I use QR Code for labelling	66 (26.8%)	99 (40.2%)	55 (22.4%)	26 (10.6%)	2.83	0.944
I use RFID for tracking of books	66 (26.8%)	101 (41.1%)	38 (15.4%)	41 (16.7%)	2.78	1.022
I use podcast to share book Reviews	56 (22.8%)	92 (37.4%)	61 (24.8%)	37 (15.0%)	2.68	0.989
Frequency of Use					**2.96**	**0.897**
Mobile Apps	105 (42.7%)	117 (47.6%)	15 (6.1%)	9 (3.7%)	3.29	0.742
Multimedia Projector	109 (44.3%)	99 (40.2%)	33 (13.4%)	5 (2.0%)	3.27	0.767
Barcode Reader	89 (36.2%)	93 (37.8%)	47 (19.1%)	17 (6.9%)	3.03	0.912
Live Streaming	68 (27.6%)	115 (46.7%)	49 (19.9%)	14 (5.7%)	2.96	0.840
I-Pad	73 (29.7%)	111 (45.1%)	38 (15.4%)	24 (9.8%)	2.95	0.918
RFID	85 (34.6%)	83 (33.7%)	43 (17.5%)	35 (14.2%)	2.89	1.040
RSS feeds	68 (27.6%)	102 (41.5%)	46 (18.7%)	30 (12.2%)	2.85	0.965
QR Code	68 (27.6%)	92 (37.4%)	57 (23.2%)	29 (11.8%)	2.81	0.973
Blogs	57 (23.2%)	106 (43.1%)	61 (24.8%)	22 (8.9%)	2.80	0.896
Podcast	53 (21.5%)	100 (40.7%)	67 (27.2%)	26 (10.6%)	2.73	0.918
Grand Mean					**2.96**	**0.899**

Source: Researcher's Field Survey, 2023

Decision Rule: 1.0-1.74 = Strongly disagree; 1.75-2.49 = Disagree; 2.50-3.24 = Agree; 3.25-4.0 = Strongly agree

The results in Table 2.0 showed that the librarians in public universities in North -Central, Nigeria agreed to the use of technology with a mean scale of $\bar{x} = 2.96$, SD = 0.899 on a 4-point Likert-type scale. Librarians were asked to identify the types of technology used in public universities in North -Central, Nigeria in Table 2.0 and the result revealed that multimedia projector, mobile apps, barcode reader and blogs were the major technology used among librarians in public universities in North-Central, Nigeria. Table 4.4 also showed that using multimedia projector for presentation is the highest rated purpose of technology use with a mean score of $\bar{x} = 3.25$ on a 4-point Likert-type scale. Furthermore, Table 2.0 revealed that the mobile apps is the most used technology $\bar{x} = 3.29$, while podcasts is the least used $\bar{x} = 2.73$ on a 4-point Likert-type scale.

Hypothesis One: Indicators of technology use will not have any influence on service delivery of librarians in public universities in North-Central Nigeria.

Table 3.0: Multiple linear regression analysis of technology use (indicators) and service delivery

Predictors	**B**	**Std. Error**	**Âeta (ß)**	**T**	***P***	**R^2**	***Adj.* R^2**	**F**	**ANOVA (Sig.)**
(Constant)	3.248	0.097		33.609	.000				
Tech Used by Librarians	-0.564	0.083	-0.555	-6.832	.000				
Purpose of Use	0.110	0.045	0.237	2.466	.014	0.284	0.275	31.935	0.000
Frequency of Use	0.268	0.047	0.588	5.658	.000				

Dependent Variable: Service delivery
Predictors: (Constant), Tech used by librarians, Purpose of use, Frequency of use
DF (F-Statistic) = 3, 245
DF (T-Statistic) = 242

Source: Field Survey Results, 2023

Table 3.0 indicates the influence of technology use indicators (Tech used by librarians, purpose of use and frequency of use). It describes that the 3 indicators of technology use have a significant influence on service delivery ($Adj.R^2 = 0.275$, F (3, 245) = 31.935, $p < 0.05$). The result shows that Tech used by librarians ($\hat{a} = -0.555$, t (242) = -6.832), $p < 0.05$) negatively influenced service delivery of librarians. The result also indicates a positive influence of purpose of use ($\hat{a} = 0.237$, t (242) = 2.466, $p < 0.05$); and frequency of use ($\hat{a} = 0.588$, t (242) = 5.658, $p < 0.05$). The positive coefficient of purpose of use and

frequency of use indicates that as their value increases, the dependent variable which is service delivery tends to increase. The negative coefficient of tech used by librarians suggests that as its value increase, the service delivery of librarians tend to decrease.

Discussion of Findings

Research question one sought to find the perception of librarians' service delivery in public universities in North-Central, Nigeria. The result revealed that the librarians strongly agreed to the perceptions held in their service delivery. This implies that the librarians deliver library services with empathy, responsiveness, reliable, tangible and with assurance. The result of this study confirmed the findings of Martins and Ledimo (2015) who discovered that workers in this government agency appeared to view service delivery innovation favorably within their organization. However, the result of this study contradicts the findings of Egunjobi *et al* (2022) and Amaechi et al. (2018) who all reported that library service delivery is low.

Research question two sought to know the uses (types, purpose and frequency) of technology use of librarians in public universities in North-Central, Nigeria. The result revealed that multimedia projector, mobile apps, barcode reader and blogs were the major technology used among librarians in public universities in North-Central, Nigeria. This study's findings corroborate the study of Anyanwu (2023), who found that there is a high degree of technology use in university libraries in Nigeria. This use of technology has primarily affected technical services (such as cataloguing and classification), readers' services (such as circulation), and current awareness services within the libraries. On the other hand, the result of this study did not agree with the findings of Amaechi et al. (2018) whose findings show that utilization of technology facilities in Ekiti State school libraries is poor.

The analysis of the hypothesis testing shows that the 3 indicators of technology use (type, purpose and frequency of use) have a significant influence on service delivery of librarians in public universities in North-Central Nigeria. These findings confirm the findings of Yusuf and Fasae (2021) who demonstrated that information and communication technology use generally helps library staff to easily provide patrons with a range of services.

Conclusion

The study analyzed the influence of technology use on service delivery of librarians in public universities in North-Central, Nigeria. The study established that librarians and library users alike agreed that there was effective service delivery in public universities in North-Central, Nigeria. The study also discovered that technology use enhanced service delivery. It was revealed that librarians used technology. This study further established that technology use had a significant influence on service delivery of librarians in public universities in North-Central, Nigeria.

Recommendations

The following were recommended

1. Though, the study showed a high level of service delivery among librarians in public universities in North-Central, Nigeria, nevertheless, there is always room for improved services among librarians.
2. The study showed that use of technology indicators (purpose of use and frequency of use) contributed significantly to service delivery. Hence, this study recommends that the library management should give more attention to the provision of technology facilities and tools as these are critical to the survival of the library and librarians in the present day IT driven world

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