Challenges associated with Adoption and Use of Digital Information Resources in Federal Universities Libraries in Nigeria

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Abstract
The study investigated the challenges militating the adoption and use of digital information resources by postgraduate engineering students in federal university libraries in Nigeria. A cross-sectional survey design was adopted. The population of the study consisted 1,695 postgraduate engineering students from 12 selected Federal universities in Nigeria. Multistage sampling technique was adopted to sample 306 postgraduate engineering students. Structured questionnaire was used to collect data. The data was subjected to descriptive statistical analysis. The findings showed that challenges faced by postgraduate engineering students in adopting and using digital information resources were inadequate or nonworking computer systems ($\overline{x}$=3.22), lack or poor internet service ($\overline{x}$=3.46) in the University's library. The study revealed that broken uniform resource locators or inaccessible online databases in the University's website ($\overline{x}$=3.37), and lack of awareness of digital information resources among postgraduate engineering students ($\overline{x}$=3.10) also constituted the challenges faced by the students. The weighed mean score of the statistical results indicated that the challenges faced by the postgraduate engineering students in adopting and using digital information resources were significant ($\overline{x}_w$ =3.076). The study recommends that government should mix and prioritise the provision of funds and supervision its policies and plans to ensure that academic libraries function well. Librarians should ensure that user education is regularly carried out to ensure that no student is left in the lack of awareness of and availability to the libraries' information resources. Library users should adopt and use only the digital information resources being acquired, subscribed to and disseminated by academic libraries.

Keywords: Digital Information Resources, Challenges, Academic Activities, Academic Libraries in Nigeria

Introduction

Academic activities are the focal ventures through which educational system impart knowledge and skills on students and allow the students to conduct practical and experiment and collaborate with fellow students and lecturers for knowledge sharing. To achieve these goals, libraries are established to conduct user education, identify information resources that are appropriate for teaching, learning and research, and by extension, acquire and disseminate print and digital information resources through purchase, donations and subscription to online databases.

Digital information resources have become increasingly important and preferred for learning, teaching, and research in academic institutions. Digital information resources have lots of features that make them attractive and preferred over print copies of information resources. Some of the notable features are ease and flexibility of use, storage and portability as well as remote access to different format and volumes of digital information resources. Unfortunately, recent studies conducted by Owolabi (2019) and Omolayo and Adedoyin (2020) among others have reaffirmed that adoption and use of these

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resources are faced with various challenges, including limited infrastructure, low levels of digital literacy, and limited funding. While library stakeholders are optimistic that

According to America Library Association (ALA), (2021), challenge-free library environment can greatly benefit the academic activities of students by providing them with the resources and support them to be successful in their studies. Furthermore, academic libraries without challenges would likely provide easy access to a large collection of books, journals, and other resources that are relevant to the students' studies, which can enhance their research and learning experience. It can be suggested that a quiet and conducive study environment allow students to focus and be productive.

It is no longer a disputable fact that when information resources—digital or printed—are in short provision or not accessible or not available for use for academic purposes, there is tendency that students' academic activities can be affected negatively (Adesola and Ojo, 2019). The quality of research related activities such as assignments, seminars, workshops, conferences and projects writing could be low (Adesola and Ojo, 2019), and could lead to students' low academic performance. Studies have acknowledged that there is a correlation between students' accessibility and use of electronic information resources and academic performance (Owolabi, 2019; Onwuka, 2020).

Studies have also confirmed that students that have access to and use internet facilitated information resources regularly are likely to develop positive interest in learning due to ease of access and use (Adedoyin, 2020; Onwuka, 2020). In recent times, poor academic performance, and rate of failures among students have been linked to poor reading, limited access to information resources, low patronage of libraries and poor attitude towards learning (Adesola & Ojo, 2019; Onwuka, 2020). Observation of students' attitudes towards libraries and result of interactive discussions with some postgraduate students in some universities in Nigeria have revealed that academic libraries seem to be less relevant to students during their academic activities. If this is true, it could have serious negative consequences on students learning outcomes.

Recent studies have focused on importance of digital information resources and technological advancement in information curation, repackaging, dissemination and storage. Few or no study has looked at the influence of challenges and opportunities on the adoption and use of digital information resources by postgraduate engineering students in federal universities, Nigeria. The purpose of this research is to analyze the challenges and opportunities for enhancing the adoption and use of digital information resources in federal universities libraries in Nigeria.

Objective of the Study

To identify the challenges against the adoption and use of digital information resources by postgraduate engineering students in Federal Universities Libraries, Nigeria

Literature review

Haruna et al. (2022) conducted a study about the challenges of access and use of electronic information resources (EIRs) among students of higher institutions in Taraba State, Nigeria. The study used quantitative research methodology, with a cross-sectional survey design to collect data from the respondents. The population of the study was 10748 drawn from 3 higher institutions with available and functional electronic information resources namely such as Taraba State University, Federal University, Wukari and Taraba State College of Nursing and Midwifery. Simple random sampling technique was used to select 370 respondents through the adoption of. Research advisors table 2006. Questionnaire was deployed to collect data while descriptive statistics with the help of statistical package for social sciences (SPSS) v.16.0. The study found out that various types of electronic

information resources such as e-books, online databases, e-journals, as well as CDROMs were available in the higher institutions under study. It was discovered that poor internet connectivity, insufficient computer terminals, inadequacy of Information and Communication and Communication Technology (ICT) skills were the challenges militating against the access and use of electronic information resources in the institutions studied.

Mohammed and Kannan (2021) carried out a study information resources and services in Agriculture University Libraries in Nigeria. The respondents were postgraduates. Simple random sampling was used to select the respondents while questionnaire was used to collected data. The researcher took 1.1% of the entire population which was 6933, amounting to 78. Findings showed that the available agricultural information resources, accessible and used were not sufficient, internet connectivity, power failure, attitudes of the staff, and currency of e-journals, e-books and loans periods, databases constituted the challenges to the use of Information and communication technologies. It can be deduced from the foregoing revelation that challenges can take different forms and dimension. In some case, certain challenges can even lead to the emergence of another challenge.

Abdulrahman and Onuoha (2019) investigated the challenges associated with accessing and utilizing library e-resources by Economics Education students in South East Nigeria. Descriptive survey research design was adopted. 492 Economics Education students were sampled. Data was collected using a questionnaire. Frequency counts and simple percentage were used to answer the research questions, while Mann Whitney U test was used to test the hypotheses at 0.05 level of significance. Based on the findings, the challenges found were slow internet speed, struggle in finding related information, surplus of information on the Internet, limited computer system, power outage, lack of ICT skills, insufficient database, Inadequate user ability in manipulating e-resources, expensive internet subscriptions, limited access to e-resources, and poor networking system.

Ugwu and Orsu (2017) conducted a study about the direct and indirect factors underlying the students' challenges with the use of online information resources in the University of Nigeria, Nsukka. Qualitative descriptive inductive content analysis was used. 200 level students were engaged in the research. Questionnaire was used to collect data and descriptive and inductive tools were used to analyse the data. The outcome of the study reported that few online resources were widely used and that the participants preferred accessing these resources from Cyber cafes. Other challenges consist of lack of browsing skills, low internet bandwidth and insufficient information and communication technology infrastructure. However, the indirect factors composed lack of internet access at home, absence of online assignments, lack of motivation to use online information and lots of students were not having personal laptops. There was no difference in the opinions of the study regarding the direct and indirect challenges.

Omeluzor, et al. (2016) investigated students' perception, use and challenges of electronic information resources in Federal University of Petroleum Resources Effurun, Nigeria. The study used descriptive survey research design and census sampling technique. 249 students of 500 levels in the Departments of College of Technology were involved in the study. Descriptive and inferential statistics were used to analyse the data. The results showed that electronic information resources are used at different level by the respondents with e-journal, e-database, web OPAC and repositories recording high usage. The study revealed that users' perception influences use of electronic information resources in academic libraries with (β =.214, p<.05). The findings further revealed that the challenges that students faced when trying to use electronic information resources were lack of awareness, lack of training, unreliable internet connectivity, insufficient e-resources in various study areas, unavailability of e-resources on and difficulty in identifying relevant information to meet users' needs. . Based on the findings of the Omeluzor, et al (2016) it could not true that such listed challenges are commonplace in all libraries.

The adoption and use of digital information resources could be altered by some of the mentioned challenges. However, shortfall in gaining benefits from the digital information resources disseminated by academic libraries is a major challenge.

Mahwasane and Mudzielwana (2016) examined the challenges confronting students while using the library and found that information retrieval skill, insufficient user education, lack of computer knowledge, lack of Information Communication Technology in adopting and using information resources were challenges faced by students. Skills related challenges have been on the limelight of many findings, since information and communication technologies emerged. It has been difficult and effort-taking to inculcate the computing skills in many users of the libraries. Several efforts have been put in place by both government and individual to alleviate the heightening impact of lack of ICT skills, but it appears that the ability of library users to demonstrate high level ICT skills have been slow over the years.

Omolayo and Adedoyin (2020) conducted a review of the adoption and use of digital information resources in selected university libraries in Nigeria and found that while there were opportunities for enhancing the use of digital information resources, challenges such as limited access to technology, low levels of digital literacy, and limited funding remained persistent. The authors suggested that there is a need for increased collaboration and training programmes to support the use of digital information resources in academic libraries in Nigeria. Similarly, Owolabi (2019) investigated the challenges and prospects for the adoption and use of digital information resources in academic libraries in Nigeria. The study discovered that a lack of technical infrastructure, limited funding, and low levels of digital literacy were the main challenges facing the adoption and use of digital information resources in academic libraries in Nigeria. The author recommended that investment in technology, training programmes, and collaboration with international organizations and academic institutions would help to enhance the use of digital information resources in academic libraries in Nigeria.

Studies have also looked at the impact of digital information resources on academic libraries and their users. Eze (2017) completed a study in which he established that the use of digital information resources in academic libraries in Nigeria improved the quality of research, increased access to information, and facilitated collaboration among scholars. The study also found that digital information resources have the potential to support the development of a knowledge-based society and enhance academic activities in Nigeria. Sharing similar reports, Adesola and Ojo (2019) explored the use of digital information resources among academic staff and students in a Nigerian university. The study found that digital information resources have improved the quality of research and provided access to a vast amount of information, leading to improved academic performance. However, the study also identified challenges such as limited access to technology, low levels of digital literacy, and limited funding as barriers to the use of digital information resources in academic libraries in Nigeria. Furthermore, Akintoye and Olanrewaju (2018) investigated the impact of digital information resources on academic libraries in Nigeria and found that digital information resources have the potential to significantly enhance the quality of research and teaching in academic libraries. The study also found that investment in technology and the provision of training and support for faculty and students would help to maximize the impact of digital information resources in academic libraries in Nigeria.

Nwagwu and Ekezie (2019) focused their study specifically on the use of digital information resources by postgraduate engineering students in Nigerian universities. The study found that digital information resources have improved access to information for postgraduate engineering students and helped to enhance the quality of their research. The study also identified challenges such as limited access to technology, high costs of digital information resources, and limited digital literacy as barriers to the effective use of digital information resources by postgraduate engineering students in Nigeria. In the

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same vein, Onwuka (2020) investigated the impact of digital information resources on postgraduate engineering education in Nigerian universities. The study found that the use of digital information resources has improved the quality of engineering education and helped to develop the research skills of postgraduate engineering students in Nigeria. However, the study also identified limitations such as limited access to technology and limited funding as barriers to the effective use of digital information resources by postgraduate engineering students.

The foregoing reviews have attempted to sort out different challenges that militated against the adoption, accessibility and use of digital information resources in various institutions of learning. Some of the challenges are related to the library users, some challenges are institutional, structural and infrastructural, which means the library institutions are bedevilled with the challenges. It can be deduced from the various findings that one form of the challenge contributed significantly to the failure or difficulty in using libraries and their information resources at different levels and circumstances. If the challenges against the adoption and use of digital information resources are not properly managed or brought to minimal level or completely removed, the credibility and usefulness of academic libraries can seriously be at heightened risk. It would be difficult for educational institutions to function effectively and efficiently without ensuring that libraries serving as blood streams of educational activities are not put in good shape. The implications for library users like postgraduate engineering students are also enormous, ranging from poor academic performance, inability to acquire sufficient knowledge and skills for discoveries and innovativeness

Richardson (2011) conducted a study where the authors drew on Rogers's theory of the diffusion of innovations and identified barriers, challenges, and successes in the adoption of technology training by teacher trainers in Cambodia. An open-ended questionnaire, face-to-face interviews, and document analysis were used to collect. The findings of the study discovered that challenges such as hardware incompatibility; complexity; language barriers; the lack of electricity, computers, Internet access, and of practice for trainees; and the inability to understand the advantages of these technologies were the challenges against the adoption and use of new technologies.

Esoswo (2011) had earlier reported that challenges relating to infrastructure, capacity building, financing the cost of use of information and communication technologies, were rampant in education and principles in practice. Challenges that could affect the adoption and use of digital information resources might take different line of effect; it is encouraging admitting that learning and researches cannot be achieved when the facilities that provide support in accessing information resources are either absent or not functioning

Results and Discussion of the Findings

Table: Challenges associated with the adoption and use of digital information resources

SNO	Challenges affected the adoption and Use of digital information resources (N=306)	SA=4 Freq. (%)	A=3 Freq. (%)	D=2 Freq. (%)	SD=1 Freq. (%)	Decision $\overline{X}$	Std.	Remark
1.	Inadequate or nonworking computer systems in the University's library	145(47.4)	102(33.3)	39(12.7)	20(6.5)	3.22	.905	SA
2.	Lack or poor Internet service in the University's library	208(68.0)	52(17.0)	25(8.2)	21(6.9)	3.46	.909	SA
3.	Inaccessible wireless access points in the University's library	30(9.8)	73(23.9)	139(45.4)	64(20.9)	2.23	.890	D
4.	Broken uniform resource locators or inaccessible online databases in the University's website	202(66.0)	28(9.2)	63(20.6)	13(4.2)	3.37	.950	SA
5.	Lack of awareness of digital information resources subscribed by University's library	165(53.9)	42(13.7)	64(20.9)	35(11.4)	3.10	1.095	SA
	Weighted mean				**3.076** (A)			

The above table presents the opinions of postgraduate engineering students on the challenges that affected their adoption and use of digital information resources for academic activities in Federal universities, Nigeria. The descriptive statistical results show that lack or poor internet services ($\overline{X}$ = 3.46, std. = .909), Broken uniform resource locators or inaccessible online databases in the University's website ($\overline{x}$= 3.37, Std. = .950), Inadequate or nonworking computer systems in the University's library ($\overline{x}$= 3.22, Std. = .905), and lack of awareness of digital information resources subscribed by University's library ($\overline{x}$= 3.10, Std. = 1.095) indicated that postgraduate engineering students significantly faced various challenges in their adoption and use of digital information resources for academic activities. The weighted mean score ($\overline{x}_w$=3.076) of the statistical results confirmed that postgraduate engineering students significantly faced challenges when adopting and using digital information resources for academic activities.

Methodology

The study investigated the challenges militating the adoption and use of digital information resources by postgraduate engineering students in federal university libraries in Nigeria. A cross-sectional survey design was adopted. The population of the study consisted 1,695 postgraduate engineering students from 12 selected Federal universities in Nigeria. Multistage sampling technique was adopted in sampling 306 postgraduate engineering students. Structured questionnaire was used to collect data. The data was subjected to descriptive statistical analysis through the use of statistical package for social science version 23.

Discussion of Findings

The descriptive statistical results about the challenges associated with the adoption and use of digital information resources for academic activities provided mix revelation. On the one hand, the findings showed that lack or poor Internet service in the university's library, broken uniform resource locators, inaccessible online databases in the University's website and lack of awareness of the digital information resources being acquired, subscribed to and disseminated by academic libraries were the

challenges that the postgraduate engineering students faced in their adoption and use of digital information resources for academic activities. The findings of this study collaborated with the discovery of Akuffo and Budu (2019) and Owolabi (2019) who reported that challenges to e-resources' utilisation were access problems, search and retrieval problems, and staff-related problems.

The revelations from the study by Nwabueze and Urhiewhu (2015) and Omolayo and Adedoyin (2020) is confirmed by the findings of this study where they reported that the challenges faced in the course of using electronic information resources were epileptic power supply, none availability of online databases, inadequate or slow bandwidth, and inadequate number of computers to access digital information resources in the library. They also reported that network problems, lack of skills to access digital information resources in both local /foreign databases of the library, lack of formal training on Internet use, server slowness, and frequent breakdown militated against the use of electronic information resources by the library users.

The discovery of this study concurs with the findings of the study carried out by Urhiewhu (2015) where they uncovered that epileptic power supply, non-availability of online databases, inadequate computers, inadequate bandwidth, network problems, lack of skill, and lack of formal training on internet use worked against the use of electronic information resources by library users.

This discovery of this study does not form alignment with revelation by Uloaku (2017) and Eze (2017) whose findings uncovered that the researchers (library users) used Internet to search and obtain data for research and publication, access e-journals, sending and receiving emails. This study highlights that awareness is prerequisite to adoption and use of digital information resources, and that if library users used Internet service and access electronic journals, it is a prove that the respondents were aware of the resources and the channels to reaching them.

Furthermore, this study also reported that inaccessible wireless access points in the Universities' libraries did not constitute challenge to the adoption and use of digital information resources by the postgraduate engineering students. This revelation is in sharp contrast to the discovery by the Uloaku (2017), Akintoye and Olanrewaju (2018) and Ojo (2019), who found out that slow internet service; Internet connection failure; inadequate number of connected systems were the challenges faced by the library users when attempting to adopt and use digital information resources being provided by academic libraries. In addition, the findings of this study equally disagree with the findings made by Ugwu and Orsu (2017) in their study. The authors uncovered that lack of browsing skills, low internet bandwidth and insufficient ICT infrastructure, whereas the indirect factors include lack of internet access at home, absence of online assignments, lack of motivation to use online information and majority of the students not having personal laptops were the challenges encountered in accessing and using electronic information resources. The differences in the outcome of the two similar studies could be because many students hardly depend on their academic libraries to connect to the internet and rather use their smartphones through which they are able to subscribe to internet services and access information resources across all platforms.

Similar to the above findings is the inadequacy or nonworking computer systems in the Universities' libraries, which, according to the analysed data constitute challenges to the adoption and use of digital information resources for academic activities. In line to this finding is the discoveries of Sejane (2017), Nwagwu and Ekezie (2019) amd Onwuka (2020) who found out that the major challenges affecting the use of electronic resources include lack of searching skills, shortage of staff due to loss of knowledgeable staff or members resigning, lack of up-to-date equipment, few computers, and slow internet connectivity. It is not surprising that in most urban areas including higher institutions, high speed internet services are available for subscription at the various rate, which are affordable to

students and library users, without depending on any institutionally provided internet connectivity. It is possible to acknowledge that wireless hotspot sharing has also made internet sharing possible, easy and flexible among researchers, especially the students at postgraduate level, who sometimes collaborate in supporting one another in research activities.

From the foregoing data presentation, analysis and discussions of findings, satisfaction and challenges are two cardinal variables that explain the degree of influence of adoption and use of digital information resources on the postgraduate engineering students' academic activities. On the side of satisfaction, it is an expression of positive impact of adoption and use of digital information resources on the academic activities of the postgraduate engineering students, which portray academic successes. The impact of successful adoption and use of information resources can be explained based on the level of satisfaction experienced by the users of the digital information resources.

On the other hand, the challenges faced in the course of adopting and using digital information resources are expression of low influence on the academic activities of the postgraduate engineering students. Challenges are obstacles that promote poor usage of information resources and could ultimately affect academic performance and low attainment of knowledge and skills acquisitions. There is a tendency to believe that the more challenges faced by the postgraduate engineering students the less likely they would adopt and use digital information resources for academic activities. Though it is possible to find a situation where despite the challenges against the adoption and use of digital information resources, the library clienteles tend to adopt and use the digital information resources.

Conclusion

The findings of this study suggest that academic libraries in federal universities in Nigeria are bedeviled with various challenges. The perspectives from various authors and the findings of the study affirmed that the available and recurring challenges are common and seem to be increasing. Based on the findings it can be concluded that the quality of knowledge, degree of skills and academic performance of postgraduate engineering students and other students may be at risk of declining. Unless the approach to eliminating the challenges is dedicative, and consistent, backed with enough funds along with intensive regular training, the credibility of academic libraries in supporting academic activities may result in declining.

Recommendations

The study recommends that government should mix and prioritise the provision of funds and tight supervision on the implementation of its policies and plans to ensure that academic libraries function well to the expectation and needs of the library users. At the same time, librarians should ensure that user education are regularly carried out to ensure that no student is left in the lack of proper awareness of the availability, accessibility and ultimate utilisation of the all information resources, including digital information resources. The library users should adopt and use digital information resources being acquired, subscribed to and disseminated by academic libraries. This is because, any information resource made available for use have undergone professional and technical selection processes, which make such information resource suitable for academic purpose.

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