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Factors Affecting the Development of E-Library in Universities in Nigeria

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Abstract

This study investigated the factors for the development of electronic library in university libraries in Southern Nigeria. The study adopted a descriptive research design with a population of 107 which comprised all the systems librarians, electronic librarians and digital librarians in the federal, state and private universities in Southern Nigeria. An online questionnaire using Google form was the main tool for data collection with a total of 107 librarians who responded appropriately. The study revealed that ICT tools, information resources and facilities were used for the development of e-library in university. The findings also showed that there was a general consensus among the respondents concerning ICT tools and resources that were used for the development of e-library such as: CD-ROM, wireless network, and interactive board, office and electrical equipment, information resources (e-book, e-journal, e-newspaper) and subscription to databases. The findings further revealed that funding, authentication, digital preservation process, copyright issues, training, and ease of access were challenges affecting the development of e-library in Nigeria. The researchers therefore recommended that universities, colleges of education and polytechnics in Nigeria should endeavor to develop its e-library by considering the findings in order to achieve its mandate of delivering quality information services to the library patrons.

Keywords

Electronic Library, Tools, University Library, South-South, E-Library Development

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Introduction

For a long time, the library has realized the importance of providing access to information in electronic format other than the print sources. Since then, it has become irresistible for the library to bring technologies, facilities, resources and tools together to actualize that purpose. That singular effort is yielding remarkable improvement in making information readily accessible to users irrespective of their locations. Overtime and since 1990s, libraries have developed and adopted different technologies with the aim of providing access to information electronically (Arms, 2012). Electronic library (e-library) has become more dynamic, providing access to information to their patrons irrespective of their geographical locations. LISBDNET (2016) defined e-library as a physical site and/or website that provides a 24-hour online access to digitized audio, video, and written materials including free copies of books, journals, and magazines and is accessible to users both within and outside the e-library building. The Cambridge Dictionary sees an e-library as a website that makes books and other reading materials available to users. The E-library breaks the barrier of a 'single user' access to information in the library as it allows multiple access to information simultaneously to varied library patrons. In most libraries, the e-library consists of advanced technologies assisting users to access electronic resources for the teaching, learning and resources purposes. IGI Global (2022) describes a modern-day e-library as "a set of documents available through electronic means by the use of digital technologies that allow for the retrieval, archiving, preservation and dissemination of those documents. Similarly, an e-library should be dynamic and extensible, supporting interoperability among heterogeneous, distributed systems (Nahak & Patra, 2014).

An e-library in any university is the hallmark of online information activities and the hub of electronic information synchronization including: access, retrieval, dissemination and storage. Arora, Trivedi and Kembhavi (2013) defined e-library as a library in which collections are stored in digital formats (as opposed to print, microform, or other media) and accessible by computers. The e-library provides opportunity for all types of learners, teachers and researchers irrespective of social status, economic, academic level and position, to interact with research works from any part of the world through the Internet. E-library enhances communication and collaboration among people including students, staff and researchers by providing a platform for teaching, learning and research activities in a university. In Nigeria, e-library is a core division of the university library that collects different electronic information resources such as: e-book, e-journal, e-database, e-newspaper, CD-ROM, e-thesis/dissertation and digitized materials among others. The e-library also creates access point to digital collections of a university through institutional repository (IR) via local area network (LAN) connecting to offices, laboratories, workshops and classroom for the purpose of making research accessible to students, staff and researchers. It is evident in some studies that an e-library in university is very important and its development is sometimes shrouded with several challenges (Omeluzor & Oyovwe-Tinuoye, 2016; Fowowe, 2017).

The requirements for the development of an e-library in developing countries may differ from the developed countries. Hence, what may be represented as the requirements in developing countries may have long been used in the developed countries. In Nigeria, the federal and state-owned universities, polytechnics and colleges of education have over the years benefited from the Tertiary Education Trust Fund (TETFund), a special fund set aside by the Federal Government of Nigeria for library's development. Such gesture from the Federal Government of Nigeria through the TETFund is significantly impacting the development and services of e-libraries in Nigerian universities. Omeluzor and Oyovwe-Tinuoye (2017) acknowledged in their study that the upgrading of the Federal University of Petroleum Resources Effurun (FUPRE) e-library and other sections of the

library was achieved through an intervention from the Tertiary Education Trust Fund (TETFund). The intervention by TETFund is greatly impacting research, teaching and learning activities of the library patrons and the development of e-library. This study therefore focuses on the veritable factors for the development of an e-library in university libraries in Nigeria.

Statement of the Problem

Statistics from the National Universities Commission (NUC)'s website shows that as at February, 2022, Nigeria has 202 universities comprising 49 federal, 54 state, and 99 private that are spread in the 36 states of Nigeria and the Federal Capital Territory. The statistics also reveal that some of the states in Nigeria have more than three universities with an increasing cost for the development of the e-library in each of the university. Abdelmalik (2022) in his short note to leaders of the National Executive Council of Academic Staff Union of Universities (ASUU) lamented that every state government now has multiple state universities including states that cannot pay the salaries of primary school teachers. The proliferation of universities is affecting the development of some critical departments of the university including the e-library and laboratories among others. Some people have classified some universities in Nigeria as "glorified secondary schools" (Phenomenal.com, 2021; Ahanor, 2017), because of their inability to develop some important departments including the e-library. The inability of developing an e-library of a university may have a negative effect in accessing electronic information for teaching, learning and research by the library patrons. This study therefore is set out to identify the factors for the development of an electronic library in Nigeria universities.

Objectives of the study

The general objective of the study is to find out the factors for the development of electronic library in Nigeria University. The specific objectives are to:

1. Find out the ICT tools used for the development of e-library in Nigeria.
2. Identify the office and electrical equipment that are used for the development of an e-library.
3. Ascertain the kind of information resources that are used for the development of an e-library.
4. Find out the challenges of encountered in developing an e-library in Nigeria.

Literature review

E-library development

The development of an e-library begins with planning. The planning stage is one of the most critical points because every other aspects and activities depend on it. According to Nahak and Patra (2014), planning of e-library should encompass the information needs, security issues, IT infrastructure, digitization, access, staffing, funding and budget among others. In addition to planning, Nahak and Patra (2014) noted that the design of an e-library should consider the users, robustness, scalability, flexibility and reliability in the delivery of services. In the view of Anyim (2018), the e-library is a multi-disciplinary concept that encompasses data management, information retrieval, library science, document management, information systems, the web, image processing, and artificial intelligence, among other fields of computer science hence its planning must consider an expanded scope of user community. The description of Anyim (2018) depicts the e-library as a unique division among other divisions of the library department of a university because of the technologies and tools that it may require for its development. Similarly, Arora, Trivedi and Kembhavi (2013) stated that a digital library is more than a repository. According to them, a digital library provides information resources in electronic format other than print format and enhances searching of electronic collections distributed across networks, rather than merely creating electronic repositories from digitized

physical materials. A study by Omeluzor, Dolapo, Agbawe, Onasote and Abayomi (2017) revealed that the development of an e-library is capital intensive and may not be possible to actualize in any university system without human resources and infrastructure including: ICT facilities, power and furniture. The resources and infrastructure are relevant for effective management and delivery of information resources and services to library patrons. The assemblage of appropriate resources and infrastructure together would enable access and dissemination of electronic information.

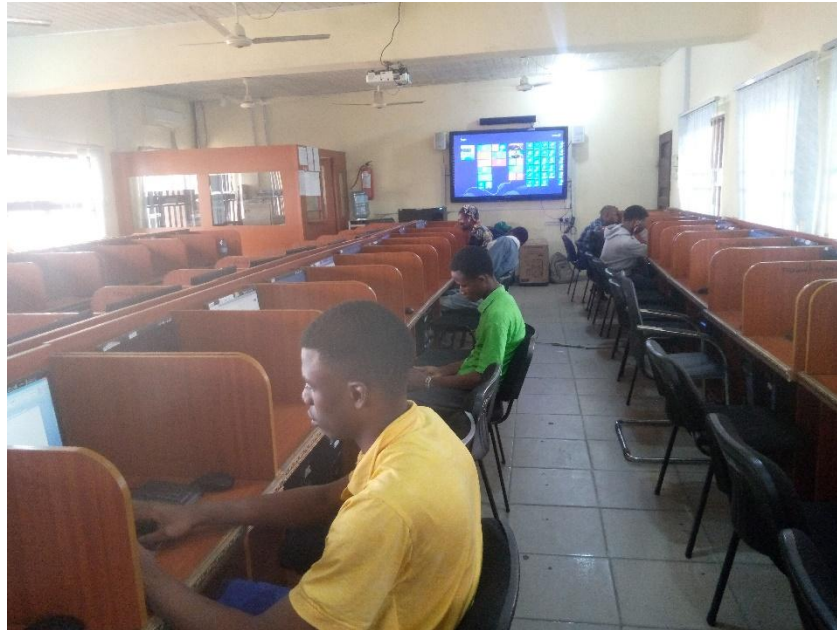


Figure 1: A typical view of an E-library

ICT tools and software

There are several ICT facilities and tools that are necessary for the development of e-library. According to Nahak and Patra (2014) several factors including technology, resources and personnel are important for the development of an e-library. They also identified some tools including CD-Rom and Optical storage device. Aboagye, Yawson and Appiah (2020) submitted that the use of computer technology and the Internet as shown in figure 1 are the main components for the development of an e-library that could enhance e-learning. The study of Tor, Gora and Ahmed (2021) revealed that Internet network, flash drive, hard drive/CD, Desktops, Printer, Laptop, email facility, scanners, projector and digital camera are ICT tools required in the e-library. A study conducted at the Imo State University and Ahmed Bello University showed that computers, the Internet and multimedia equipment and other relevant information technologies were available in the e-libraries of both universities that helped in teaching, learning and research of library patrons (Onyebinama, 2013; Karim, Said & Samadi, 2017).

Sutton (2007) observed that there are two major changes that information and communication technology (ICT) brought into the library that has transformed the e-library. These include: transformatory and evolutionary. According to Sutton, the transformatory changes has harnessed ICT to perform old tasks better through the automation of housekeeping tasks such as reference works, circulation, acquisition and serials management with the use of integrated library software (ILS) that are performed more efficiently in an ICT environment while the evolutionary changes on

the other hand enhances the emergence of new functions arising out of an expanded, demand-driven information society, wider and/or interdisciplinary jurisdiction and closer focus on user needs. The transformatory and evolutionary changes increases the use of integrated library software (ILS) for the development of the library and enhancing service delivery to the library patrons.

The development of e-library enables communication, access and dissemination of electronic information among other sections of the library, university and through networking of computers that enhances the day-to-day activities. According to Omeluzor and Omeluzor, (2017), the use of information technologies for the networking of computers in an e-library enable easy access to information, sharing and delivery of information services among libraries and their patrons. Some of the technologies such as switches, network cables, optic fiber, computer system and internet service provider (ISP) among others enhances interoperability and seamlessness. The facilities and resources are the bone of an e-library. The development of an e-library provides basis for an enhanced e-learning environment in a university.

On the software for e-library development, a study by Adedokun, Ahmad and Miskon (2022) further found that plagiarism software is relevant and need to be introduced into course management system of university to promote good practice. In addition, Adedokun, Ahmad and Miskon found out that gamification is necessary for students' engagement, fun and enthusiasm and can be explored by library management for the development of e-library. Similarly, Omeluzor and Ugoji (2020) reported that the adoption of igame contributed to the development of the FUPRE e-library. Furthermore, Nahak and Patra (2014) found out that Dspace, editing software, E-print Liner operating systems, digital library software, Greenstone, Fedora among others are needed for the development of digital library.

Office and electrical equipment

The development of an e-library entails the acquisition of office and electrical equipment to enhance work and functions of librarians. Nahak and Patra (2014) in their study identified scanners, printers, digital camera as some of the equipment needed for the development of e-library. Office equipment including tables and chairs should be considered for the users. Ergonomic demands that office equipment should be suitable to avoid health challenges. Office equipment increases delivery of services to library patrons. UNAIDS (n.d.) advocated that there should be "a back-up plan and equipment in place in case of a security breach" for the development of e-library.

Electronic information resources

Electronic information resources, otherwise known as e-resources is a broad name covering different types of electronic information sources that are available in electronic format either on the Internet or acquired by a library to provide access to current information for learning, teaching and research activities of library patrons. E-resources may include but not limited to electronic books (e-books), electronic journals (e-journal), e-indexes, CD-ROM/DVD, e-thesis and dissertation, e-reference works, digital collections, databases, online public access catalog (OPAC) and institutional repository (IR), among others. According to Ugwu and Onyegiri (2013) e-resources may include, but are not limited to: web sites, online databases, e-journals, e-books, electronic integrating resources, and physical carriers in all formats, whether free or fee-based, required to support research in the subject covered, and may be audio, visual, and/or text files. Similarly, Ekere, Omekwu and Nwoha

(2016) identified other sources of electronic information resources which include: World Wide Web; WIFI; search engines; online indexes; video CDs VSAT based Internet connectivity; online library catalogue; online databases; portals; e-journals and e-books. Anyim (2018) study of three universities in Kogi State, Nigeria found out that online databases, OPAC, e-journals, e-books, wireless network and search engines ranked high among all other electronic information resources for the development of an e-library. Similarly, Naqvi (2012) study showed that electronic databases such as AGRIS, AGRICOLA, CAB abstract, and agriculture & natural resources were used at the e-library by postgraduate students in at GBPUAT, India.

Challenges of developing an e-library

Funding

The development and administration of an e-library in any part of the world is capital intensive. This is due to the high cost of information communication and technology (ICT) equipment and other facilities that would be needed to enhance communication, access, storage and retrieval of information. Ayo (2001) stated that most university libraries in Nigeria are yet to fully implement ICT because of paucity of funds, erratic power supply, and lack of qualified personnel to drive the tool. Kato, Kisangiri and Kaijage (2021) study revealed that funding, copyright issues, authentication, digital preservation, ease of access and technical protection are among the challenges hindering the development and administration of an e-library. Earlier, Aina (2014) and Oguonu (2013) bemoaned that inadequate funding is affecting the development of the e-library, ICT components and provision of relevant information sources as up-to-date books are no longer found in libraries. According to Omeluzor and Oyovwe-Tinuoye (2016) some academic libraries are yet to fully implement automation software to manage their library services due to insufficient funding. Funding is integral for the acquisition, maintenance and use of ICT equipment such as: integrated library software (ILS), digital facilities and e-resources.

Funding is also necessary for the initial installation and software licensing, access to electronic journals, online databases, and Internet connections (Isiam & Isiam, 2006). Nahak and Patra (2014) suggested that in order to meet the expenditure for the development of an e-library, appropriate funds should be provided by the library authorities. Study has shown that most universities in the South-West region of Nigeria do not have adequate funding to develop their ICT, Internet services, and training of e-library personnel compared to other regions in the world and that insufficient funding of library software, poor infrastructure, retrospective conversion of information materials into digital form, unavailability of library software experts and insufficient training programmes for staff are the problems for the development of e-library in Nigeria. (Omeluzor & Oyovwe-Tinuoye, 2016). Similarly, Fowowe (2017) admitted that despite the efforts that universities in Nigeria are making, funding of university libraries is inadequate, affecting collection development, e-library development and hiring of adequately skilled workers. The study of Oguonu (2013) on reference and information services in State teaching hospital medical libraries in South-East Nigeria, revealed that relevant services were not provided by the libraries due to inadequate fund to acquire ICT facilities to implement online catalogue.

Copyright issues

The development of the e-library's collection is tied around access to copyrighted information which remains a challenge. A study by Adogbeji and Akporhonor (2021) revealed that copyright restriction was a challenge for the development of digital contents in the e-library. Ferullo (2004) stated that

“some of the major copyright issues facing libraries have some type of digital component. As a result of the new laws and recent court decisions, copyright compliance for libraries in the digital environment poses constant challenges.” Most of the electronic materials that are accessible at the e-library are not the property of hosting institutions. Hence, the library has to secure some materials that are under copyright laws. However, to receive permission for distribution remains a challenge. Mishra (2016) found out intellectual property right is a concern in developing e-library. Ferullo (2004) identified four key issues that invoke confusion and concern as to the applicability of the copyright law in the delivery of e-library services which include e-reserves, licensing, document delivery, and fair use. Copyright law protects the intellectual property of every work, be it open or closed. Copyright law protects the intellectual property of any creator whether the materials are freely accessible or closed access. Choudhury, Hobbs, Lorie and Flores (2002) revealed that the reason for the protection of intellectual property of digital sources at the e-library is that there are beneficiaries who cause heavy damages to work. The fear of damaging the original content of a work as well as manipulating it into another persons’ property increases the reason for copyright law. According to Ferullo (2004), the *Tasini* decision also wreaked havoc in libraries, particularly for document delivery services. He noted that publishers have removed articles from databases making it virtually impossible to access some works, particularly if there is no print version. Removing works that might be subject to potential copyright infringement litigation is far easier to do in an electronic environment like the e-library than a print one (Ferullo, 2004). Niqresh (2019) submitted that the library may have copyright challenge as it tries to provide services through the Internet to its users. A paper by Sahoo and Rao (2003) discussed the copyright Act of India in relation with digital libraries. According to Sahoo and Rao (2003), technological developments in ICT accelerated the use of information in digital libraries across India, but the Copyright act prevents the unauthorized use of authors’ original work in India. Sahoo and Rao (2003) further submitted that current copyright law in India does not discuss digitization of information – particularly its storage, its use in the network environment and fair use in the digital environment. However, the work provided a brief idea about copyright issues and its implications in digital libraries. Panezi (2014) focuses on the legal challenges for online digital libraries. He stated that the Internet’s potential to revolutionize the way we access and then produce culture and knowledge should be supported by a regulatory framework that would promote wide accessibility to information.

Training

Training is essential in facing the dynamic changes in the society and in the workplace. Training is a planned and continuous program that aims to position employees in solving different kinds of administrative problems in the workplace (Bamidele, Omeluzor, Imam & Amadi, 2013). The acceleration of workflow in the e-library – accessing, retrieving, storing, dissemination and using information sources are usually handled by librarians who from time to time need training to use technologies for the delivery of information and services to the library patrons. According to Adogbeji and Akporhonor (2021), librarian competency is very crucial to the successful implementation and application of ICT to library operations. Bamidele, Omeluzor, Imam and Amadi (2012) stated that training is necessary to face the realities at work on a daily basis. Training enhances personnel to be well equipped for challenges that may otherwise overwhelm them. Uzoamaka (2021) opines that the training of librarians in the 21st century should integrate the aspect of digital information management system (DIMS) since most libraries especially in developing countries are digitizing their local resources and are in a hybrid form. While the development of an e-library is of utmost importance to the library and university management, the development of

librarians' ICT skill should not be ignored. Hence, development of an e-library's technologies should align with the training of librarians. Training and human capital development have been identified as a panacea for solving challenges in the work environment, hence it increases productivity, improves employees' morale, reduces errors, and enhances less supervision (Slee, 1997; Obi & Zakari, 2005; Cole & Kelly, 2011). Furthermore, Anyim (2018) carried out a study on e-library resources and services improvement and innovation of access and retrieval for effective research activities in university e-libraries in Kogi State Nigeria. The population was 240 users of university e-libraries in Kogi State. The study revealed that training ranked first among other items and was considered as important to enable e-library users gain retrieval skills to access information.

Authentication

The electronic library runs on several IT facilities within through the local area network (LAN) and outside through the wide area network (WAN). Some of the facilities that enable communication of information need authentication from vendors, suppliers and providers. Internet connection also comes through an internet service provider (ISP) which requires an authentication. According to Kato, Kisangiri and Kaijage (2021), it would be a good idea to consider technical protection measures such as e-watermarking, digital signatures, authentication, etc. since e-libraries are in the process of creating digitally born content to regulate infringement in the digital environment. Mishra (2016) has identified user authentication for access to collections as a challenge for the development of digital libraries. Among the notable obstacles to fully develop an e-library are poor Internet connectivity, poor ICT infrastructure, licensing limitations on access to the digital library collection, user authentication, download delay, lack of comprehensive ICT and searching skills among library staff, high cost of affordable online access, and low organizational budget for library departments (Kato, Kisangiri & Kaijage, 2021).

Digital preservation

Preservation of digital collections is an important library activity. Digital resources can be stored on a server and made available to the library patrons at the e-library. Panezi (2014) stated that digitization of information would bring new life to works, enhancing access and bringing information closer to the users. A huge chunk of e-library resources are collected from various departments within the university and thereafter digitized to ease access to them. The resources include: thesis, dissertation, inaugural lectures, presentations, publications. Materials for preservation in a digital system may appear in text, audio, visual, audiovisual and may be prepared in any of the following format: PDF, MS Word, MS PowerPoint, XPS document and JPEG among others to enhance accessibility by the patrons. Despite the importance of e-library, Chukwu, Emezie, Emerole and Nwakwuo (2018) identified erratic power supply, lack of modern infrastructure, lack of skilled staff, nonchalant attitude of departments as the major factors affecting effective use of e-library in a Nigerian University of Technology.

Ease of access to resources

Access to information is the bedrock and fundamental for the development of an e-library. The study of Tor, Gora and Ahmed (2021) revealed that majority of the respondents in their study stated that easy access to available ICT tools helped to improve their project research. According to Naqvi (2012), 50% of the postgraduate students were not using e-databases due to poor facility at the e-library. Inadequate facility could lead to poor access to electronic resources. Hence, ease of access to information resources should be considered as a criterion for the development of e-library.

Acquisition of ILS software

Library software is a tool that enables the storage, retrieval and dissemination of information to the library users. Integrated library software (ILS) captures the bibliographic details of all materials in a library's collection. ILS contributes to the development of the library in the 21st century. Studies have shown some challenges of ILS in Nigeria university libraries. Most of the studies focus on cost and automation process, such as: technical, retrospective conversion, vendors' attitudes, inadequate funding, inadequate skill, inadequate ICT facilities, power supply, and others (Agboola, 2000; Sani & Tihamiyu, 2005; Osaniyi, 2010; Mbakwe & Ibegbula, 2014). Back in the 90s when libraries in Nigeria adopted ILS and had numerous challenges, today's libraries are making tremendous progress and contributing to the development of e-libraries in Nigeria. A study by Omeluzor (2020) revealed that university libraries in Nigeria have made remarkable progress in the adoption and use of ILS for library services. There is evidence that the performance of the ILS adopted in the selected university libraries in Nigeria was encouraging in the area of data entry and currency, accuracy, reliability, completeness, flexibility, ease of use, and timeliness in the delivery of information resources to the library users. The delivery of services that was traditionally handled are currently being delivered using ILS. Majority of the respondents in the study specified that the ILS adopted at their various libraries provided on-the-spot access to resources for their patrons, enable sharing of information resources with other libraries, allows use of online cataloguing, access to books and external sources, and make online instruction available for staff and students (Omeluzor, 2020).

Power supply

Some university libraries in Nigeria have made tremendous efforts in the adoption and use of ICT while, others are yet to use ICTs fully due to inadequate funding, interruption in Internet access, and unreliable power supply (Ayo, 2001; Omeluzor & Oyovwe-Tinuoye, 2017). Power supply in libraries to fully utilize ICT tools in e-libraries in Nigeria has remained a huge challenge. The findings in Omeluzor, Dolapo, Agbawe, Onasote and Abayomi (2017) revealed $X = 2.81$, $SD = 1.27$ indicating that power supply was highly dilapidated in university libraries in South-South and South-East of Nigeria which affected the turnover intention of librarians in the affected universities. Another study has further shown that irregular power supply is common and a huge problem in the Nigeria system leading to underdevelopment of e-library (Akinwale, 2010). In addition, Haliso and Ogungbemi (2014) stated that the irregular power supply in Nigeria is another problem that confronts the development of e-libraries in university library.

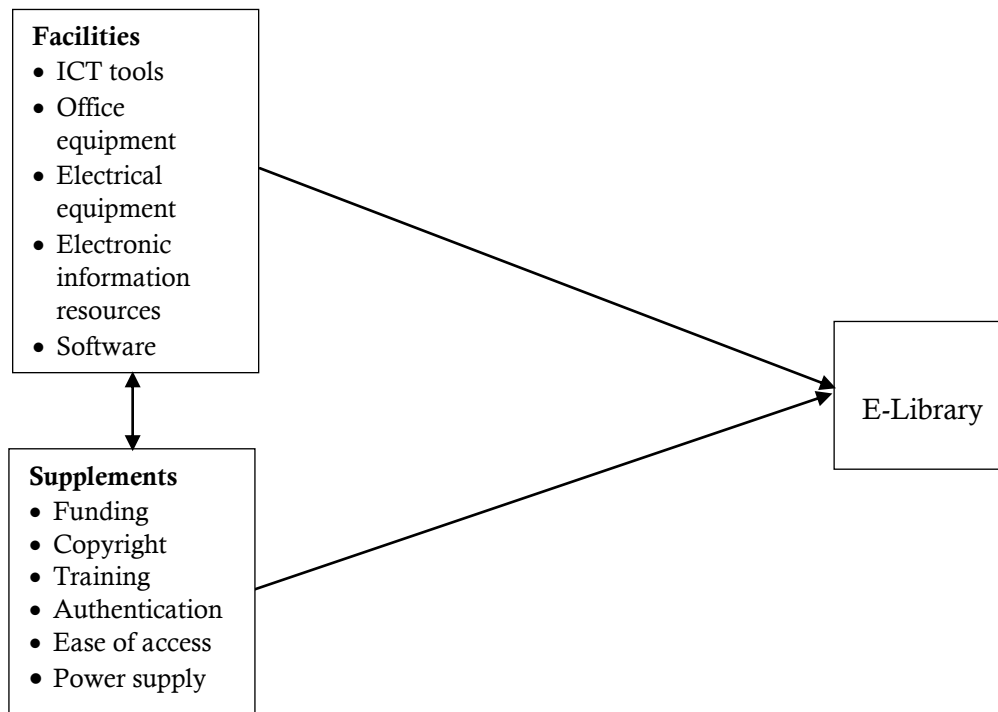


Figure 2: Conceptual model for e-library development

The model in figure 2 shows the facilities and supplements that can help the speedy development of an e-library. The facilities comprise ICT tools, office equipment, electrical equipment, e-resources and software. The tools enhance access, retrieval and dissemination of information. In the same vein, a number of supplements as shown in the second box in figure 2 also contribute to the development of an e-library including funding, copyright, training, authentication, ease of access and power supply. The arrow linking the facilities with the supplements indicates that the facilities and supplements are intertwined and relevant for the development of e-library. The supplements may sometimes stand as challenges, but they are extremely relevant for the development of an e-library and cannot be ignored. Hence, identifying both the facilities and supplements for the development of an e-library is what the current study unfolds.

Methodology

Research Approach

A descriptive survey design was adopted for the study. A study has proved that a descriptive survey design gives some levels of reliability and realistic results in research that use data in Social Science (Omeluzor, 2020). The population of the study comprised all the systems/electronic/digital librarians in the federal, state and private universities in Southern Nigeria. There are 202 universities including federal, state and private universities in Nigeria. Out of which 130 are located in the Southern part of Nigeria (Nigeria Universities Commission, 2022). The target population for this study is the systems/electronic/digital librarians from each of the universities in the Southern Nigeria, hence, the population is made up of 130 respondents, one from each of the universities. Instrument for data collection is a structured online questionnaire that was designed by the Researchers. The research instrument was developed using Google Form available at: <https://tinyurl.com/2p97njrc> to provide answers to the research objectives. The instrument has five sections, i.e. Sections A to E. Section A of the instrument provide the demographic information of the respondents. Section B has thirty-one

questions providing answers on the necessary ICT tools that are used for the development of an e-library. Section C focuses on the office and electrical equipment. The researchers listed out thirteen equipment and asked the respondents to identify and tick the options that they believe were used for the development of an e-library. In section D, the questions focus on the information resources that are used for the development of e-library. Section E has six questions which identified the challenges encountered in the development of e-library. The questionnaire was distributed to the respondents through their respective verified WhatsApp number/email addresses. The email addresses of the respondents were retrieved from past Nigeria Library Association (NLA) annual conference/general meeting attendance list. Sending the questionnaire directly to the respondents' verified WhatsApp number and email addresses eliminated responses from unintended respondents. Out of the total population of 130 that the questionnaire was sent to, 107 responded appropriately and were used for the analysis of this work. The data collected were analysed using Statistical Package for Social Sciences (SPSS) version 16.0 and results are presented in frequency, percentage and chart for clarity and understanding.

Findings

Demographic information of the respondents

The survey cut across IT, Digital, Electronic and Systems Librarians in university libraries in Southern Nigeria. The focus of the study is to identify the contextual dynamics of developing an electronic library in Nigeria universities.

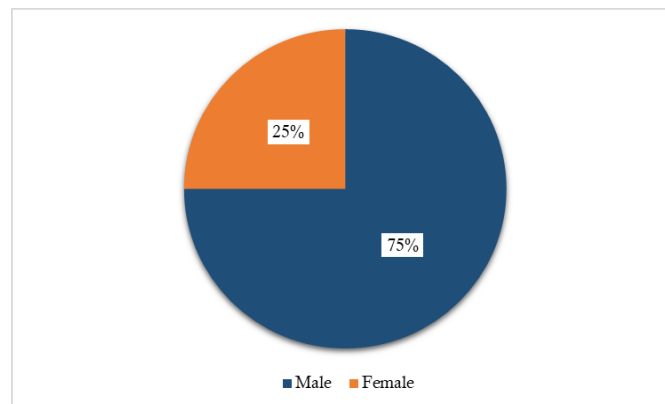


Figure 3: Gender of the Respondents

Among the respondents as represented in figure 3, the result shows that 75% were male while 25% were female. This means that there are more male IT librarians in Southern Nigeria than their female counterpart. The result also reveals that female are taking the role of IT in libraries.

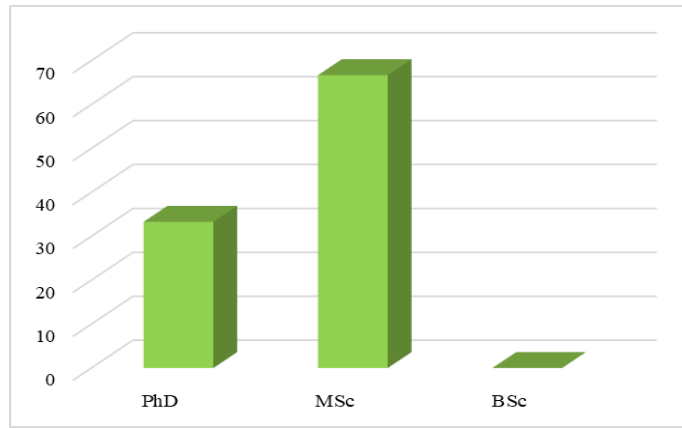


Figure 4: Academic qualification of Respondents

The result on the qualification of the respondents in figure 4 reveals that, 33.3% had PhD, 66.7% had Masters while none had Bachelors. The result in figure 5 further shows the designation which indicates that none of the respondents is in the category of Deputy University Librarian (DUL) and Assistant librarian. However, the result shows that 16.7% were Senior Librarians, 33.3% were librarian 1, and another 16.7% were librarians II.

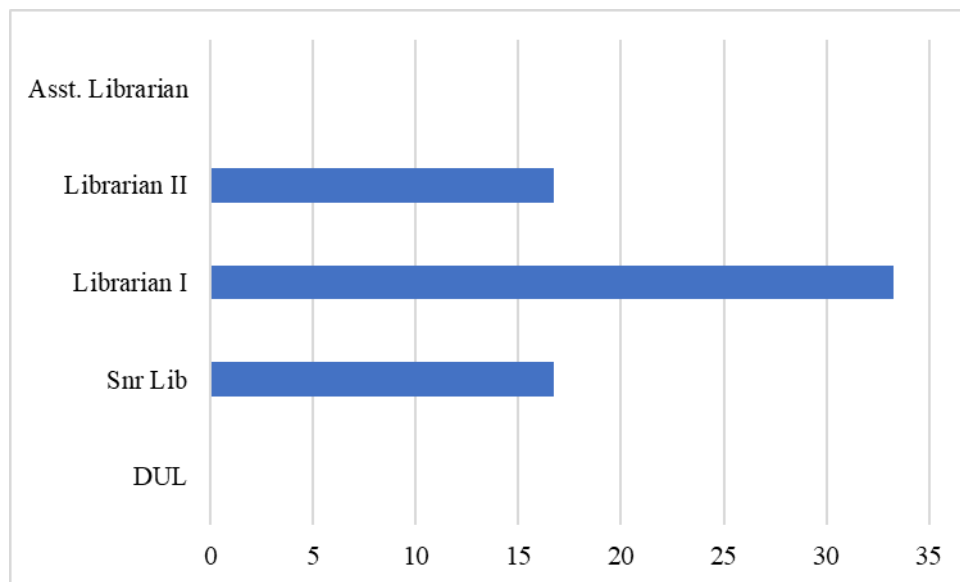


Figure 5: Designation of the Respondents

The respondents were also asked to indicate whether they work at the e-library. The result shows that 91.7% of respondents answered in the affirmative while 8.3% responded in negative. It means that a lower number of the respondents do not directly work at the e-library but perhaps were assigned role to serve at the e-library. The researchers also asked the respondents “how long they have worked at the e-library.” The purpose was to know their length of service at the e-library which would help the researchers to ascertain their knowledge about the e-library department.

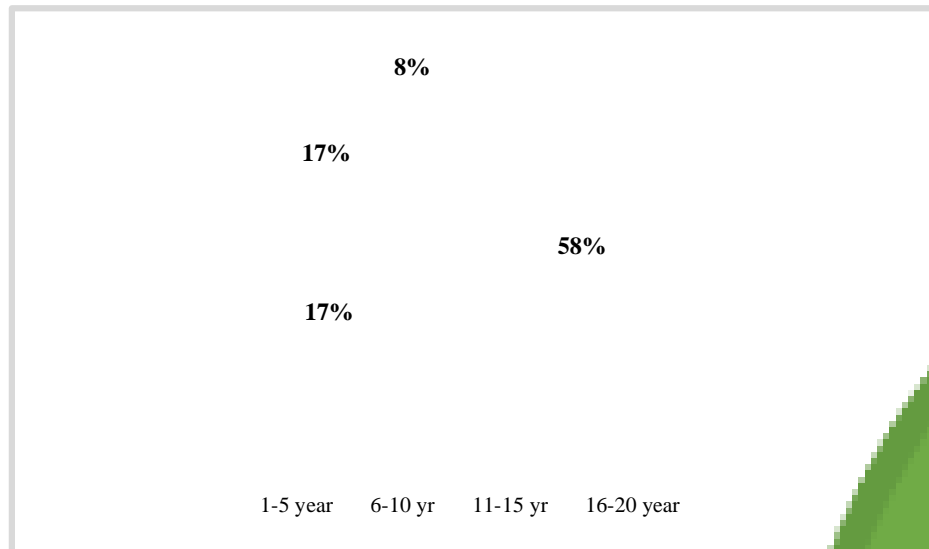


Figure 6: Length of Service

The result in figure 6 shows that a higher percentage of the respondents (58%) indicate 1-5 years, 17% of the respondents indicate to work 6-10 years and 11-15 years respectively while a lower number of the respondents, (8%) indicate to work for 16 – 20 years. The result shows that majority of the respondents have longer years of service at the e-library and should be able to identify some of the contextual dynamics in developing electronic library in university libraries in Nigeria.

Objective 1: ICT tools used for the development of e-library in Nigeria.

The first objective reveals the ICT tools that were used for the development of e-library in Nigeria universities as shown in Table 1.

Table 1: ICT tools used for the development of e-library in Nigeria

Statement	SA	A	U	D	SD
Telecommunication facilities are necessary for e-library development	39 (31)	47 (37.3)	19 (15.1)	21 (16.7)	-
Computer and servers are needed to start up an e-library	33 (26.2)	38 (30.2)	19 (15.1)	36 (28.6)	-
Scanner is needed for an e-library	27 (21.4)	38 (30.2)	19 (15.1)	42 (33.3)	-
Digital collections are mostly needed at the e-library	27 (21.4)	42 (33.3)	19 (15.1)	38 (30.2)	-
Printer should be needed for the development of an e-library	34 (27)	41 (32.5)	19 (15.1)	32 (25.4)	-
Network mast is necessary for an e-library's development	29 (23)	44 (34.9)	19 (15.1)	34 (27)	-
Modem is needed for the development of e-library	30 (23.8)	43 (34.1)	19 (15.1)	34 (27)	-
Local Area Network (LAN) adapter are necessary for e-library's development	35 (27.8)	42 (33.3)	19 (15.1)	30 (23.8)	-
Routers are necessary for e-library's development	35 (27.8)	41 (32.5)	19 (15.1)	31 (24.6)	

Storage devices such as HDD, Flash drive, CD-ROM are needed for the development of an e-library	30 (23.8)	41 (32.5)	19 (15.1)	36 (28.6)	
Racks to safeguard network switches are important in the development of an e-library	32 (25.4)	39 (31)	19 (15.1)	36 (28.6)	
Network switches are important for e-library's development	32 (25.4)	41 (32.5)	19 (15.1)	34 (27)	
Network cables are needed for the development of an e-library	33 (26.2)	41 (32.5)	19 (15.1)	33 (26.2)	
Connectors are necessary for the development of an e-library	26 (20.6)	44 (34.9)	19 (15.1)	37 (29.4)	
Projector is required for the development of an e-library	30 (23.8)	40 (31.7)	19 (15.1)	37 (29.4)	
Digital board would be required for the development of an e-library	31 (24.6)	42 (33.3)	19 (15.1)	34 (27)	
Internet Service Provider (ISP) is necessary for the development of an e-library	31 (24.6)	42 (33.3)	19 (15.1)	34 (27)	
Integrated library software (ILS) is necessary for the development of e-library	35 (27.8)	50 (39.7)	19 (15.1)	22 (17.5)	
Gamification (iGames) is necessary for the development of an e-library	53 (42.1)	31 (24.5)	-	23 (18.3)	19 (15.1)
Plagiarism software is necessary for the development of e-library	48 (38.1)	47 (37.3)	19 (15.1)	12 (9.5)	-
Research analysis software (i.e. SPSS, Stata and others) are necessary for the development of an e-library	55 (43.7)	43 (34.1)	19 (15.1)	9 (7.1)	-
MATLAB for Science and Technology is necessary for the development of an e-library	17 (13.5)	-	19 (15.1)	48 (38.1)	42 (33.3)
Git and GitHub is necessary for the development of an e-library	19 (15.1)	-	14 (11)	41 (33.3)	51 (40.5)
Python and Linux software are necessary for the development of an e-library	-	19 (15.1)	13 (10.3)	47 (37.3)	47 (37.3)
Aspen HYSYS is necessary for the development of an e-library	-	19 (15.1)	8 (6.3)	43 (34.1)	56 (44.4)
MS Visio is needed for the development of an e-library	48 (38.1)	-	11 (8.7)	48 (38.1)	19 (15.1)
Comsol Multiphysics is necessary for the development of an e-library	-	11 (8.7)	19 (15.1)	48 (38.1)	48 (38.1)
SQL would be necessary for the development of an e-library	35 (27.8)	-	19 (15.1)	8 (6.3)	64 (50.8)
R and Rstudiois necessary for the development of an e-library	-	19 (15.1)	11 (8.7)	50 (39.7)	47 (37.3)
NVivo is needed for the development of an e-library	13 (10.3)	19 (15.1)	-	47 (37.3)	46 (36.5)

N = 107, SA = strongly agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly agree

The result in Table 1 shows that majority of the respondents agreed that scanner (68.3%), computer and servers (56.4%), Scanner (51.5%), digital collection (51.5%), and Printer (59.5%) were used for the development of e-library. It also reveals majority of the respondents agreed that Network mast (57.9%), Modem (57.9%), LAN adapter (61.1%), Router (60.3%), storage devices (56.3%), racks (56.4%), network switches (57.9%), network cables (58.7%) and Connector (55.5%) are used for the development of e-library. The result in Table 1 also indicates that majority of the respondents agreed that projector (55.5%), digital board (57.9%), ILS (67.5%), plagiarism software (75.4%), research

analysis software (77.8%) and gamification software (66.6%) were used for the development of e-library. The result is supported by Adedokun, Ahmad and Miskon (2022) whose study revealed that plagiarism software is relevant for the development of e-library. In addition, the result agrees with the findings of Omeluzor and Ugoji (2020) who found out that gamification is necessary for the development of e-library. The result implies that for the development of a standard e-library, the ICT tools and facilities have been identified as been relevant for the development of e-library in Nigeria. The result in Table 1 further shows that majority of the respondents disagrees that MATLAB (71.4%), Git and GitHub (73.8%), Python and Linux (74.6%), Aspen HYSYS (78.5%), MS Visio (53.2%), Comsol Multiphysics (76.2%), SQL (57.1%), R and Rstudiois (77%), and NVivo (73.8%) were used for the development of e-library in Nigeria. From the result, it can be inferred that the software are not necessary for the development of e-library. Although, the software may be installed at the e-library for learning and research by students, staff and researchers, but they are not needed for the development of e-library.

Objective 2: Office and electrical equipment that were used for the development of an e-library

One of the purposes for this study is to identify the office and electrical equipment that were used for the development of e-library. That is shown in the results in figure 7.

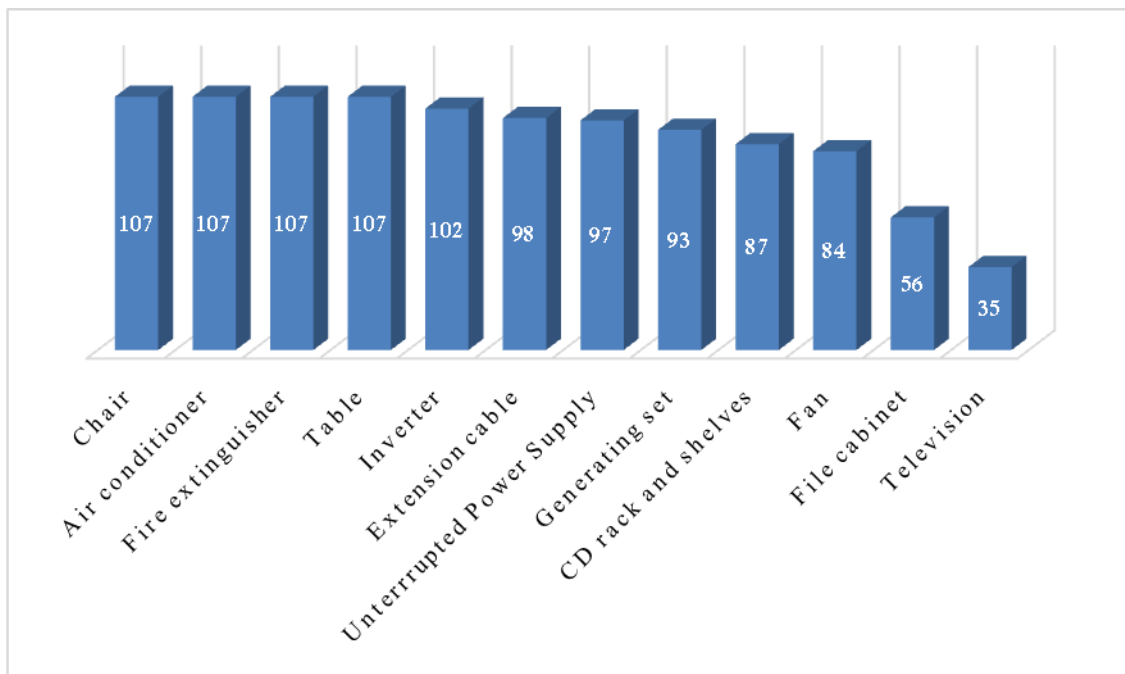


Figure 7: Office and Electrical Equipment needed for the development of e-library

The result in Figure 5 reveals that 107 (100%) of the respondents indicates that chair, air conditioner and table were used for the development of e-library. The result validates the findings by Omeluzor, Dolapo, Agbawe, Onasote and Abayomi (2017) which showed that chair, air conditioner and table are relevant library infrastructure for the development of the library which in turn reduces the turnover intentions of librarians. The result in figure 7 also shows that 102 (95.3%) of the respondents specifies that inverter was used for the development of e-library. The result shows that 98 (91.5%), 97 (90.6%) and 93 (86.9%) of the respondents affirms that extension cable, UPS and

generating set respectively were used for the development of e-library. The result also reveals that 87 (81.3%), 84 (78.5%) and 56 (52.3%) of the respondents indicates that CD rack and shelves, fan and file cabinet respectively were used for the development of e-library. This result supports the findings of Nahak and Patra (2014) whose study revealed that storage devices such as: optical storage device, CDROM, Jukebox, etc. are needed for the development of e-library. The result in figure 7 also shows that a lower number 35 (32.7%) of the respondents indicates that television was used for the development of e-library. From the result, since 32.7% is lower than 50% of the total respondents, it is evident that television was not be used for the development of e-library. This perhaps is because the e-library is mostly used for online research via the Internet where the computer could be used to access audio-visual materials.

Objective 3: Information resources that were used for the development of e-library.

The result in Table 2 shows the information resources that were used for the development of e-library

Table 2

Information Resources	SA	A	U	D	SD
Electronic databases (i.e. Ebsco, Science Direct, Research4Life etc.) are used for the development of e-library	42 (33.3)	50 (39.7)	19 (15.1)	15 (11.9)	-
e-Books are used for the development of e-library	30 (23.8)	41 (32.5)	36 (28.6)	-	19 (15.1)
e-Journals are used for the development of e-library	35 (27.8)	41 (32.5)	19 (15.1)	31 (24.6)	
Audio materials are used for the development of e-library		39 (31)	19 (15.1)	41 (32.5)	26 (20.6)
Audio-visual materials are used for the development of e-library	20 (15.9)	16 (12.7)	-	41 (32.5)	30 (23.8)
e-Newspapers and e-Magazines are used for the development of e-library	31 (24.6)	39 (31)	37 (29.4)	19 (15.1)	-
Students' projects are used for the development of e-library	3 (2.4)	36 (28.6)	-	31 (24.6)	37 (29.4)
Theses and dissertations are used for the development of e-library	1 (8)	27 (21.4)	39 (31)	40 (31.7)	-
Lecture notes are used for the development of e-library	27 (21.4)	19 (15.1)	38 (30.2)	27 (21.4)	-
CD-ROM databases is used for the development of an e-library	30 (23.8)		19 (15.1)	43 (34.1)	34 (27)
Catalogue databases is used for the development of e-library	42 (33.3)	30 (23.8)	35 (27.8)	19 (15.1)	-

N = 107, SA = strongly agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly agree

The result in Table 2 shows that majority 73% of the respondents agreed that electronic databases were used for the development of e-library. The result also reveals that majority, 56.3% and 60.3% of the respondents agreed respectively that e-books and e-journals were used for the development of e-library. The result support the findings of Anyim (2018) whose study indicated that online databases, OPAC, e-journals, e-books and search engines ranked high among all other electronic information resources for the development of e-library. This result confirms the assertion by Ugwu and Onyegiri (2013) who recognized that the resources were used for the development of e-library. The result in Table 2 also reveals that majority 55.6% and 57.1% of the respondents agreed that e-

newspaper and catalogue database were used for the development of e-library. The result in Table 2 is in tandem with the findings of Nahak and Patra (2014) and further agrees with Ekere, Omekwu and Nwoha (2016) who identified information resources as requisite for the development of e-library. The result in Table 2 also indicates that majority 53.1%, 56.3%, 54% and 61.1% of the respondents respectively disagree that audio, audio-visual, students' projects and CD-ROM were used for the development of e-library. It also reveals that some percentage of the respondents, for instance, 29.4%, 31%, 30.2% and 27.8% were indifferent which indication that they were neither agree nor disagree that the information resources were used for the development of e-library in Nigeria. The implication of the results in Table 2 is that since information resources are requisite for the development of e-library, the absence of it may have a negative effect on the development of e-library in university.

Objective 4: Challenges encountered in the development of an e-library in Nigeria

The result in Table 3 shows the challenges encountered in the development of an e-library in Nigeria University.

Table 3

Challenges	SA	A	U	D	SD
Funding of e-library is a challenged for its development	42 (33.3)	50 (39.7)	19 (15.1)	15 (11.9)	-
Copyright issues is a challenged for the development of an e-library	20 (15.9)	16 (12.7)	-	41 (32.5)	30 (23.8)
Training of librarians is a challenged for the development of an e-library	31 (24.6)	39 (31)	-	37 (29.4)	-
Authentication is a challenged for the development of an e-library	31 (24.6)	37 (29.4)	-	36 (28.6)	3 (2.4)
Digital preservation is a challenged for the development of an e-library	39 (31)	40 (31.7)	19 (15.1)	27 (21.4)	-
Ease of access is a challenged for the development of an e-library	38 (30.2)	42 (33.3)	-	27 (21.4)	19 (15.1)

N = 107, SA = strongly agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly agree

The result in Table 3 shows that majority 73% of the respondents agreed that funding is a challenge for the development of e-library. The result substantiates the assertion by Fowowe (2017) who stated that despite the efforts that universities in Nigeria are making, funding of university libraries is inadequate, affecting the development of e-library and collection development. The result in Table 3 further shows that majority 55.6% of the respondents agreed that training was a challenge for the development of e-library. The result aligns with several literature (Uzoamaka, 2021; Anyim, 2018, Cole & Kelly, 2011) which affirmed that inadequate training of librarians would have a negative effect on the development of e-library, increase productivity, and skill in using ICT tools. The result also reveals that majority of the respondents 54%, 61.7% and 63.5% agreed that authentication, digital preservation and ease of access respectively were major challenges in the development of e-library in Nigeria. The result is supported by the findings of Kato, Kisangiri and Kaijage (2021), Omeluzor and Oyovwe-Tinuoye (2016), Oguonu (2013) and Ayo (2001) who found out that inadequate funding, authentication and digital preservation are challenges affecting the development of e-library in Nigeria. The result in Table 3 also reveals that majority 56.3% of the respondents disagree that copyright is a challenge. The result is not in line with the findings of Niqresh (2019)

who submitted that the library may have copyright challenge as it tries to provide services through the Internet to its users.

Conclusion

The strategic nature of the e-library in a university cannot be overemphasized. The e-library is a critical department of the library that support the library patrons either online and offline because its services extend beyond opening hour. No doubt, the e-library is the epic centre for accessing information and services on the Internet and databases. This present study attempts to expose the facilities and equipment that are relevant for the development of e-library. It is evident that ICT tools, office/electrical equipment and information resources are useful for the development of e-library. From the findings, it is important for librarians and library management to allocate available funds to the identified tools, information resources and facilities in order to achieve development of e-library and the library in general. The study substantiates that ICT tools, information resources, facilities and furniture are the fundamentals for the development of e-library. The study is significant at a time when universities in developing countries are struggling with inadequate funding due to economic downturn caused by COVID-19 pandemic. The findings also reveal those important factors that pose as challenge while addressing them would benefit the library patrons to access, use information and services at the e-library without hitches. No single study has revealed the factors that this present study reveals for the development of electronic library in Nigeria, hence this study would serve as a ready document for university library in Nigeria to adopt for development of e-library.

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