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Access to, Use, and Effect of Open Educational Resources: The Perspectives of LIS Academics in Selected Nigerian Universities

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Abstract:

This study investigated access to, use of, and the effect of Open Educational Resources (OER) on LIS academics in Nigeria. The study adopted a purely quantitative method, using a survey as the research design. The population of the study comprised LIS academic staff in Nigerian universities. Through a total enumeration method, a sample of 140 LIS academics from 15 universities in Nigeria was selected. A questionnaire developed for data collection was administered to the 140 respondents, of which 133 copies were returned. Seven objectives were developed to guide the study. The results demonstrated that office documents such as Word and PowerPoint, open textbooks, lecture notes, quizzes and tutorials, MOOCs, learning modules, and open courseware are the OER resources most frequently accessed by LIS academics. Mobile phones and laptop computers are the primary devices used by LIS academics for accessing OER. OER are used by LIS academics for teaching and learning, research, preparation for workshops, seminars, conference presentations, and class notes. The effects of OER on LIS academics include the ability to use materials created by other colleagues and customise course materials to create an ideal course packet or textbook. Policies guiding the use of OER include equal access, protection of intellectual property rights, and open licences such as Creative Commons. The challenges LIS academics encounter when using OER include frequent power outages, untimely updates of OER repositories, and prolonged periods spent searching for resources in institutional repositories.

Keywords: *access and use, library and information science, LIS academic staff, Nigeria.*

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Introduction

Advancement in Information and Communication Technology (ICT) has led to significant possibilities in every facet of human endeavour, ranging from communication, health, transportation, healthcare, and education, among others. It has transformed the world into a global village in which people from different parts of the world can easily communicate, share resources, exchange ideas, and collaborate. The invention of the internet and its adoption in teaching and research activities have greatly transformed the educational system. Through the internet, seamless access to information resources is now possible, whereby holdings of digital libraries can be accessed and shared online. The growth of ICT also sparked the establishment of Open Educational Resources (OER), which are now widely used.

Using OER, such as open textbooks, offers a global opportunity to explore the development of free, flexible instructional materials. Studies in this area of application offer a chance to examine potential ways that open resources could lower post-secondary education costs in regional settings. The advantages of OER are becoming more widely known, albeit gradually. Research on the efficacy of OER for post-secondary teaching and learning is expanding, and

early adopters of OER are experimenting with a range of resources. International academics propose a number of strategies to raise learners', educators', and institutions' awareness of the benefits of OER. Campaigns to raise awareness of OER, professional development opportunities for teachers and students, and assistance with course redesign through the timely distribution of funding have been highlighted (Goodwin, 2011; Hayman, 2018).

Many scholars have defined OER in different ways based on their perspectives. For instance, Butcher (2015) described OER as any educational resources created specifically for use in teaching and learning, including course materials, curriculum maps, multimedia applications, streaming videos, textbooks, and other materials. Teachers and students can access those resources freely and without having to pay any additional costs for licenses, royalties, or passwords (European Commission on Lifelong Learning Programme, 2013). Atkins, Brown, and Hammond (2007) defined OER as digitised teaching, learning, and research materials in any format that are in the public domain and made available under an open licence, allowing others to use, access, repurpose, reuse, and redistribute them with little to no restrictions.

OER can include entire courses or programmes, course materials, modules, student guides, teaching notes, textbooks, research articles, videos, assessment tools and instruments, interactive materials such as simulations and role-plays, databases, software, apps (including mobile apps), and any other educationally useful materials, according to Zaid and Alabi (2020), citing the United Nations (2015). The ideals of globalisation and the need to share resources, technical know-how, and competence form the foundation for OER. The development of ICT has not only enhanced global economic and social networking activities but also global collaborations and resource sharing (Cascio & Montealegre, 2016). Faculty members, irrespective of their discipline, have much to gain from OER, provided they can access the resources through the requisite technological infrastructure. They can also use these valuable resources to facilitate teaching, learning, and research activities. The primary objective of OER is to provide unrestricted access to educational resources globally without barriers, through the sharing of academic, educational, and scholastic publications for academics, researchers, and librarians at no cost (Hakim, 2017).

Guo et al. (2015) found that: (1) the majority of faculty members surveyed were aware of the concept of sharing educational resources, but they rarely used it; (2) they observed online educational materials published for learning or reference but ignored open-source software or licensing tools for resource sharing and reuse; (3) professors' lack of time and skills posed a significant barrier to developing OER, although a lack of incentives could also be a factor; (4) content, experience, and school factors influenced professors' use of OER; (5) online teaching experiences had an impact on faculty members' incentive to develop OER as well as their understanding of how to develop OER. It also had a significant impact on how faculty members perceived habit and experience as potential obstacles to using OER. The authors advocated for more concerted efforts to improve awareness and development of OER.

OER have proven to be extremely advantageous for self-learning, distance learning, and lifelong learning (Yuan & Powell, 2013). They have also made course materials more accessible to students at all levels (Caswell, Henson, Jensen, & Wiley, 2008; Yuan & Powell, 2013; Yuan et al., 2008). Siemens (2003) argued that sharing OER is free of cost, offers educators alternatives, boosts market competition, is democratic, and helps maintain public education. OER is gaining popularity among academics and students because it increases access to education while giving users access to high-quality resources for research and instruction. One of the many programmes designed to close the knowledge gap between the world's impoverished and information-rich countries is OER. Unfortunately, the level of OER usage by academics in developing nations, particularly African countries plagued by poverty and lack of educational resources, is very low (Percy & Van Belle, 2012). The survey found obstacles that both existing and prospective OER users cite as impeding their usage or having a negative impact on their intention to utilise it. These obstacles include personal resources, context, relevance, and discovery.

Problem Statement

In developed nations, access to and use of Open Educational Resources (OER) is not a significant issue compared to developing and underdeveloped nations, which are still grappling with erratic power supply, low bandwidth, deficiencies in ICT infrastructure and information literacy skills, and poor internet connectivity (UNESCO, 2022). Availability does not necessarily translate to accessibility and utilisation. Although OER are free and devoid of any restrictions or legal encumbrances, they remain inaccessible to many because they are primarily available online.

OER are one of the foundational initiatives aimed at providing equal access to educational materials for users, including students, lecturers, and researchers, regardless of their background. OER are becoming increasingly common (Hoosen & Butcher, 2019), and policymakers are now paying greater attention to their accessibility, as evidenced by established recommendations (UNESCO, 2017). However, the degree to which OER are genuinely accessible remains under scrutiny (Zhang et al., 2020).

Existing studies have explored various dimensions of OER, including access, use, adoption, and awareness among students, lecturers, faculty members, and researchers. However, most of these studies have been conducted in developed countries such as Europe, America, and the UK. Furthermore, these studies have predominantly focused on professionals in fields such as engineering, healthcare, science, social science, and education.

There appears to be a dearth of literature specifically examining access to and use of OER by Library and Information Science (LIS) academics. In particular, there is limited or no research exploring the access to, use, and effects of OER among LIS academics in Nigeria. Access typically determines use; without adequate access, the use of electronic and online information resources becomes nearly impossible.

This apparent gap suggests that the issue may have been overlooked or underexplored by LIS researchers in Nigeria. Given this identified gap, this study investigated access to, use, and the effects of OER on LIS academics in Nigeria. Specifically, the study sought to:

1. Determine the level at which Nigerian LIS academics have access to Open Educational Resources.
2. Identify the types of OER accessible to and used by Nigerian LIS academics.
3. Identify the devices used by Nigerian LIS academics to access OER.
4. Examine the purposes for which Nigerian LIS academics use OER.
5. Identify the effects of OER use on Nigerian LIS academics.
6. Determine whether institutional policy guidelines exist to guide the use of OER by Nigerian LIS academics.
7. Identify the challenges faced by Nigerian LIS academics when using OER.

Related Works

Open Educational Resources (OER) are any educational resources that are freely available for use by teachers and students without the need to pay royalties or licence fees. This includes curriculum maps, course materials, textbooks, streaming videos, multimedia applications, podcasts, and any other materials created with the intention of being used in teaching and learning (UNESCO, 2021). As a result, definitions of OER have evolved from describing the contents themselves to mentioning the technologies required to support OER, and finally touching on concepts pertaining to relevant legal and economic challenges. However, as practice advances, OER definitions will solidify, become more comprehensible, and gain widespread acceptance.

Open Educational Resources (OER) are teaching, learning, or research materials that are provided under intellectual property licences or in the public domain and allow for the free use, adaptation, and dissemination of information, according to UNESCO. According to UNESCO, intercultural communication, sustainable social and economic growth, and peace are all facilitated by universal access to high-quality education. Open Educational Resources (OER) offer a strategic opportunity to enhance policy discourse, knowledge-sharing, and capacity-building, in addition to improving educational quality. It should be highlighted, nonetheless, that in order to fully realise the advantages and potential of OER in open and distance learning as well as general education, access to and utilisation of them are crucial.

Regarding the definition provided by the Cambridge Advanced Learner's Dictionary (2008), access pertains to the entitlement or chance to utilise or gain advantages from anything. The term "accessibility" describes how people with varying abilities can use a framework, resource, service, or product in an effective, efficient, and fulfilling manner (ISO 9241-171, 2008). While creating an open content course saves a university money and effort, it presents challenges for educational institutions that provide free educational resources. That is, the cost of technology has no bearing on the adoption of OER (Butcher & Hoosen, 2012). Any number of students can obtain course materials using electronic mail or an online platform (Caswell et al., 2008).

According to a study by Dhanarajan and Abeywardena (2013), there are many advantages to using OER in Asian academic institutions. These advantages include improved access to high-quality resources, increased scientific research and education as publicly open activities, decreased course development costs for institutions, outreach to underserved communities, support for developing nations, independence from publishers, the ability to create more flexible materials, conducting research and development, and forming long-term partnerships.

Universities that employ free educational resources report that they are superior to those sold commercially (Bliss et al., 2013; Kimmons, 2015). Open textbooks are evidently needed; however, according to a recent regional survey conducted in the United States, less than 5% of teachers used them in their classes, even though 91% of them would be willing to (Martin et al., 2017). Universities are making use of open educational resources (OER), according to Inegbedion and Opateye (2018). In China, over 150 universities participated in the China Open Resources for Education initiative, and 11 prestigious universities in France established the Paris Tech Open Courseware (OCW) project to improve teaching and learning in educational institutions.

Mckerlich, Ives, and McGreal (2013) discovered that academic journals, audio, video, pictures, and textbooks were among the OER types utilised in another study on the usage of OER in higher education. Just 29% of the employees created open educational resources (OER) for software, games, animations, textbooks, tutorials, quizzes, audios, videos, photos, lesson groups, and scenarios. According to Inegbedion and Opateye's (2018) research, academic staff at single-mode institutions receive greater incentives to promote open educational resources (OER) than academic staff at dual-mode schools.

OER are incredibly helpful to faculty members in terms of instruction. Out of the 657 teachers surveyed from 214 institutions spread across 28 Commonwealth countries, Open Educational Resources in the Commonwealth 2016 revealed that 65% used OER directly in teaching and learning, 60% used it to supplement existing lessons, and 72% said they do not share their teaching material openly (Phalachandra & Abeywardena, 2016). OER have the potential to benefit a wide range of stakeholders, including government agencies, educators, and students (Ememe & Modebelu, 2019).

Access to learning resources, inclusive and equitable quality education, opportunities for lifelong learning for all, and innovative teaching and learning are all made possible by Open Educational Resources (OER) (Commonwealth of Learning, 2017; Onifade, 2016). They can lower expenses, boost accessibility to educational options, and improve quality (Wright & Raju, 2012). Through OER, lecturers can find relevant teaching content from around the world. It brings dynamics into the teaching and learning process through accessible content and makes teaching and learning participatory. Miracle (2020) asserted that OER have improved access to education, especially for those who cannot enrol in conventional programmes because of the demands of their jobs.

According to the OPAL (2011) study, people in developing countries encounter five primary obstacles when attempting to use open educational resources (OER): insufficient institutional support; absence of technological tools for sharing and modifying resources; insufficient user skills and time; insufficient quality or fitness of the resources; and personal issues such as lack of trust and time. One more issue with OER is that faculty members have a false impression of them. When choosing educational resources for their students, some lecturers typically consider established effectiveness and quality (Allen & Seaman, 2014). According to some professors, open-access textbooks are of poorer quality, which can inevitably result in less successful learning outcomes (Kahle, 2008). In their study, Orwenjo and Erastus (2018) noted that some of the obstacles to the adoption and usage of Open Educational Resources (OER) in Kenyan schools include inadequate infrastructure, unfavourable attitudes, a lack of ICT competences, other skill gaps among instructors, and a lack of administrative support.

On the other hand, the challenges facing the use of OER by faculty members in developed countries are slightly different from what their colleagues in developing nations face. In an American study, Anderson, Gaines, Leachman, and Williamson (2017) listed the following as obstacles to the use of open educational resources: cost, labour exploitation, cultural and linguistic barriers, interoperability, sustainability, quality, copyright, lack of institutional policies and incentives, and technical demands. According to the study (Harley, Lawrence, Acord, & Dixson, 2010), faculty members at Tufts and other Californian universities were hesitant to use open educational resources (OER) because of concerns about perceived low quality of content, time constraints, and author remuneration loss. Hylén (n.d.) pointed out that obstacles to the adoption of OER in France included a lack of knowledge about copyright concerns, quality assurance, and the viability of OER programmes. Adopting this technology is hindered by problems with end-user usability and obtaining copyright clearance for resources with a significant number of images.

Research Method

The design adopted for this study was a survey. Creswell and Poth (2018) described survey research as the process of gathering information about prevailing conditions or situations for description and interpretation. A survey was adopted because it involves describing characteristics of the population of interest in a particular problem, and the responses of the participants are expected to provide solutions to the problem. According to Tella (2020), surveys are frequently employed in information system and library science research to obtain self-reported data from study participants. A survey design was deemed appropriate for this study because it enables the researcher to contact a sizable portion of respondents (LIS academics) at specific Nigerian universities and draw generalisations from the data collected.

Population of the Study

The population of the study comprises all LIS academics in the fifteen universities specifically chosen to participate. The target population for the study includes academics who teach LIS in selected universities across three geopolitical zones of Nigeria.

Sample Size and Sampling Technique

The sample for the study was obtained through a total enumeration of all available Library and Information Science academic staff from 15 Library Schools at 15 different universities that participated in the study. These universities were selected from three out of the six geopolitical zones in Nigeria, namely the South-West, North-Central, and South-South regions. These 15 LIS departments were chosen because they are fully accredited by the Nigerian Universities Commission (NUC). The samples from the various universities differed due to factors such as the functioning of their institutional repositories, ongoing subscriptions to various electronic databases and open educational resources, and the availability of digital library services as part of each university's library infrastructure. These factors collectively contributed to the selection of the participating universities by creating an environment conducive for LIS academics to access OER. The analysis of the sample taken from each of the universities is presented in Table 1.

Table 1. Sample selection

S/N	Universities	Sample Taken
1.	University A	13
2.	University B	12
3.	University C	8
4.	University D	6
5.	University E	9
6.	University F	6
7.	University G	15
8.	University H	6
9.	University I	14
10.	University J	4
11.	University K	12
12.	University L	10
13.	University M	12
14.	University N	8
15.	University O	5
	Total	**140**

Data Collection Instrument

Data were gathered using a questionnaire created by the researcher. A questionnaire is one of the most effective tools available for collecting data in survey research. The questionnaire comprised two main sections: Section A and Section B. Section A collected demographic data about the respondents, including age, gender, and educational attainment. Section B consisted of seven sub-sections (i–vii), each containing items related to LIS academics' access to, use of, and the impact of open educational resources (OER). The following is a full description of each section:

1. Section BI: Nigerian LIS academics' access to Open Educational Resources was discussed in this section. Responses to the seven items ranged from extremely accessible, accessible, somewhat accessible, to not accessible. The section's contents were modified from Pete et al. (2018).
2. Section BII: This section featured items on types of OER accessed and used by Nigerian LIS academics. It contained seven items with responses ranging from YES/NO. Items in this section were generated from Pete et al. (2018) and Njeze (2020).
3. Section BIII: This section addressed devices used by Nigerian LIS academics to access OER. It included seven items with responses ranging from YES/NO. Items in this section were self-generated.
4. Section BIV: Items in this section focused on the uses of OER by Nigerian LIS academics. It comprised seven items with responses also ranging from YES/NO. The items in this section were self-generated from the literature.
5. Section BV: This section featured items on the effects of the use of OER on Nigerian LIS academics. It included seven items with responses ranging from strongly agree to strongly disagree. The items in this section were self-generated from the literature.
6. Section BVI: Items in this section explored institutional policy guidelines that guide the use of OER by Nigerian LIS academics. It contained ten items with responses ranging from strongly agree to strongly disagree. The items in this section were adapted from Hayman (2018) and Shank (2014).
7. Section BVII: The final section examined challenges faced by Nigerian LIS academics when using OER. It included ten items with responses ranging from strongly agree to strongly disagree. The items in this section were adapted from Guo et al. (2015).

Validity and Reliability of the Instrument

The questionnaire was presented to two departmental colleagues of the researchers to establish the face and content validity of the items and to ensure their relevance. Several of the elements were revised, removed, or replaced based on colleagues' feedback and recommendations. The test-retest approach was employed in this study to evaluate the reliability of the questionnaire. Thirty academic staff members from a different subject area at a university outside the three geopolitical zones of Nigeria included in the study were given copies of the questionnaire. To determine the questionnaire's reliability coefficient, the gathered responses were divided into equal halves and subjected to Pearson Product Moment Correlation analysis. The reliability of each section of the questionnaire, as well as the overall reliability of the entire instrument, is presented in Table 2.

Table 2. Reliability co-efficient

S/N	Variables	No of Items	Co-efficient
1	Accessibility to OER	7	0.79
2	Types of OER accessible to and used	7	0.80
3	Devices used by Nigeria LIS academics to access OER	7	0.70
4	Uses of OER by Nigeria LIS academics	7	0.77
5	Effects of the use of OER on Nigeria LIS academics	7	0.70
6	Institutional policy guidelines guiding OER	10	0.75
7	Challenges facing the use of OER	10	0.84
	Overall reliability of scale	**55**	**0.76**

Data Collection Procedure

A Google Form was created to accommodate all the items in the developed questionnaire designed for data collection in this study. The link to this Google Form was sent to a contact person in each of the participating library schools across the three regions. These contact persons were instructed to assist in uploading the link on the departmental forum or to share the links directly with their colleagues. The respondents accessed the Google Form containing the questionnaire, filled it out, and submitted it following the instructions provided on the form. Approval was obtained from the appropriate authorities for the administration of the instrument, and the informed consent of the respondents was sought before distributing the questionnaire. Out of the 140 targeted respondents, 133 completed and returned the questionnaire, while seven cases were reported as missing. The breakdown of the completion and submission of the questionnaire is presented in Table 3.

Table 3. Questionnaire return rate

S/N	Universities	Copies of the Questionnaire Administered	Copies of the Questionnaire Returned
1.	University A	13	13
2.	University B	12	12
3.	University C	8	8
4.	University D	6	6
5.	University E	9	7
6.	University F	6	6
7.	University G	15	12
8.	University H	6	6
9.	University I	14	12
10.	University J	4	4
11.	University K	12	12
12.	University L	10	10
13.	University M	12	12
14.	University N	8	8
15.	University O	5	5
	Total	**140**	**133**

Method of Data Analysis

As this study employed a descriptive survey design, a descriptive method of analysis was used to examine the data collected. Frequency counts and simple percentages were utilised to address the research questions.

Ethical Consideration

To ensure eligibility for data collection in this study, the researcher obtained a letter of introduction from the Head of the Department of Library and Information Science. Furthermore, the ethical committee of the authors' university granted approval for the study's conduct. All assessed work was approached impartially, and none of the respondents felt coerced into participating in the study during the questionnaire's administration. Additionally, measures were taken to ensure that all respondents remained anonymous throughout the study.

Result

The results obtained from the analysis of the data are presented as follows.

Table 4. Level of access by Nigeria LIS academics to open educational resources

S/N	Open Educational Resources	Levels of Accessibility			
		Highly Accessible	Accessible	Mildly Accessible	Not Accessible
1.	Office documents (like Word, PowerPoint, Excel) and PDF	75 (53.4%)	50 (37.6%)	7 (5.3%)	1 (0.8%)
2.	Images, audio, steaming videos	55 (41.4%)	22 (16.5%)	45 (33.8%)	11 (8.3%)
3.	Open textbooks, lecture notes, quizzes, tutorials	73 (54.9%)	38 (28.6%)	18 (13.5%)	4 (3.0%)
4.	Open courseware	65 (48.9%)	56 (27.1%)	11 (8.3%)	4 (3.0%)
5.	whole courses, massive open online courses (MOOCs), learning modules	71 (53.4%).	38 (28.6%)	21 (15.8%)	6 (4.5%)
6.	Dataset	21 (15.8%)	11 (8.3%)	6 (4.5%)	95 (71.4%)
7.	Others	0 (0%)	0 (0%)	0 (0%)	0 (0%)

In this context, accessible refers to being able to be reached or entered, reachable, or within the reach of users. The levels of access were adapted from Pete et al. (2018) and categorised as highly accessible, accessible, mildly accessible, and not accessible. The results on the level of accessibility of OER, as shown in Table 4, reveal that office documents such as Word and PowerPoint were reported as highly accessible by 91% of LIS academics. This was followed by open textbooks, lecture notes, quizzes, and tutorials, which were reported as highly accessible and accessible by 83.5% of LIS academics. Additionally, MOOCs, learning modules, and whole courses were considered highly accessible by 82% of respondents. Open courseware was reported as highly accessible by 66% of LIS academics. However, 71.4% of LIS academics indicated that datasets were not accessible to them. These results suggest that office documents, open textbooks, lecture notes, quizzes and tutorials, MOOCs, learning modules, and open courseware are the OER resources most highly accessible and accessible to LIS academics.

Table 5. Types of OER accessed, and used by Nigeria LIS academics

S/N	Open Educational Resources	Accessibility and Use	
		YES	NO
1.	Office documents (like Word, PowerPoint, Excel) and PDF	132 (99.2%)	1 (0.8%)
2.	Images, audio, video	122 (91.7%)	11 (8.3%)
3.	Open textbooks, lecture notes, quizzes, tutorials	129 (97.0%)	4 (3.0%)
4.	Open courseware	129 (97.0%)	4 (3.0%)
5.	whole courses, massive open online courses (MOOCs), learning modules	127 (95.5%)	6 (4.5%)
6.	Dataset	38 (28.6%)	95 (71.4%)
7.	Others	0 (0%)	0 (0%)

The results on the types of OER accessed and used by LIS academics, as shown in Table 5, reveal that office documents are the most accessible and frequently used resources. These are followed by open textbooks, lecture notes, quizzes, tutorials, open courseware, and MOOCs with learning modules. However, datasets were reported as not accessible and, consequently, not used by LIS academics. These findings suggest that office documents are the most accessible and widely used type of OER, followed by open textbooks, lecture notes, quizzes, tutorials, open courseware, and MOOCs with learning modules.

Table 6 presents the devices used by LIS academics to access Open Educational Resources (OER). The results reveal that LIS academics predominantly use mobile phones for accessing OER. This is followed by laptop computers and, to a lesser extent, tablets. Conversely, devices such as smart boards, desktop computers, and palmtops are minimally

utilised by LIS academics. These findings suggest that mobile phones and laptop computers are the primary devices employed by LIS academics to access OER.

Table 6. Devices used by Nigeria LIS academics to access OER

S/N	Devices Used to Access Open Educational Resources	Use of Devices	
		YES	NO
1.	Desktop Computers	35 (26.3%)	98 (73.7%)
2.	Laptop Computers	127 (95.5%)	6 (4.5%)
3.	Mobile Phones	132 (99.2%)	1 (0.8%)
4.	Tablets	76 (57.1%)	57 (42.9%)
5.	Smart board	15 (11.3%)	118 (88.7%)
6.	Palmtops	47 (35.3%)	86 (64.7%)
7.	Others	0 (0%)	0(0%)

Table 7. Use of OER by Nigeria LIS academics

S/N	Uses of Open Educational Resources	Responses	
		YES	NO
1.	Teaching and learning	133 (100%)	0(0%)
2.	Module preparation	118 (88.7%)	15 (11.3%)
3.	Preparing Class Notes	129 (97.0%)	4 (3.0%)
4.	Research	129 (97.0%)	4(3.0%)
5.	Preparation for Workshops, Seminars, and Conferences presentations	132 (99.2%)	1 0(0.8%)
6.	Preparation of Courseware	127 (95/5%)	6 (4.5%)
7.	Others	0 (0%)	0(0%)

Table 7 illustrates the various purposes for which LIS academics use Open Educational Resources (OER). The results reveal that OER are primarily utilised for teaching and learning, workshops, seminars, conference presentations, preparation of class notes, and research. Additional uses include the preparation of courseware and learning modules. These findings suggest that OER serve multiple purposes for LIS academics, with key applications in teaching and learning, workshops, seminars, conference presentations, class notes preparation, and research.

Table 8. Effects of the use of OER on Nigeria LIS academics

S/N	Effects of Open Educational Resources on LIS Academics	Level of Agreement			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Expanded access to learning.	117 (87.9%)	16(12.0%)	0 (0%)	0 (0%)
2.	Easy to distribute at almost no cost, which improves scalability	98(73.7%)	33(24.8%)	2(1.5%)	0 90%)
3.	The resources can also be used as substitutes for textbooks and lectures if the information is deficient.	93(70.0%)	34(25.5%)	6 (4.5%)	0(0%)
4.	Available material quickly increases the relevance and timeliness of the material that is being covered.	78(58.7%)	32(24.1%)	13(9.7%)	10(7.5%)
5.	With open educational resources (OER), instructors can tailor their textbooks and course packets to suit the needs of their students, breaking free from the conventional one-size-fits-all approach.	120(90.2%)	11(8.2%)	1 (0.8%)	1(0.8%)
6.	The kind of customisation gives the faculty control over their course material quality and the timing and type of updates to textbooks and other resources.	88(66.2%)	44 (33.0%)	1(0.8%)	0(0%)
7.	Knowing that other colleagues may use my materials, improves the quality of my OER	121(91.0%)	10(7.5%)	1(0.8%)	1(0.7%)

The results of this study, as shown in Table 8, reveal that OER have significant effects on LIS academics. Among the effects identified are enabling LIS academics to utilise materials created by their colleagues, providing the freedom to modify textbooks or course materials to produce the "perfect" package as opposed to being restricted by the conventional one-size-fits-all approach, and enhancing LIS professors' knowledge base. Additionally, the quality of OER has improved, scalability has increased, easy dissemination of educational materials has been made possible at no cost, and OER can serve as substitutes for traditional textbooks and lecture notes. These findings suggest that OER

have notable effects on LIS academics, including empowering them to use resources developed by their peers and offering the opportunity to customise course materials to create tailored teaching resources.

Table 9. Institutional policy guidelines that guide the use of OER by Nigeria LIS academics

S/N	Institutional Policy Guiding Open Educational Resources	Level of Agreement			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	There are policies adopted by my institution in support of the use of OER	91(68.4%)	42 (31.6%)	0(0%)	0(0%)
2.	I am aware that everyone at my school has equitable access to instructional resources thanks to the OER policy.	78(58.6%)	40(30.0%)	10(7.5%)	5(3.7%)
3.	In my school, there are policies for managing and utilizing OER as the primary or supplementary materials to support our courses.	77(57.8%)	50(37.6%)	3(2.3%)	3(2.3%)
4.	Does the license in my institution allow for educational reuse of the materials?	71(53.4%)	51(38.3)	7(5.3%)	4(3.0%)
5.	The license allows modifications or adaptations of the materials	64(48.1%)	44(33.1%)	17(12.8%)	8(6.0%)
6.	I am confident that there is a policy that supports finding and using OER in my institution.	91(68.4%)	42(31.6)	0(0%)	0(0%)
7.	I understand open licenses such as Creative Commons	74(55.6%)	38(28.6%)	11(8.3%)	10(7.5%)
8.	I have to follow some policies protecting the intellectual property rights of my materials	56(42.1%)	29(21.8%)	28(21.1%)	20(15.0%)
9.	I have to follow some policies in providing access to intellectual property rights to materials that do not belong to me.	66(49.6%)	33(24.8%)	30(22.6%)	4(3.0%)

The results presented in Table 9 confirm that LIS academics strongly agree that there are policies guiding the use and access to OER in their respective universities. For instance, more than half of the respondents (68.4%) strongly agreed that their institutions have adopted policies supporting the use of OER. Similarly, another 68.4% strongly agreed that they are confident such policies exist to support the discovery and use of OER within their institutions. However, there is no clear indication of an overall understanding of what these policies specifically cover. These findings confirm that institutional policies are in place to guide the use of OER in the selected LIS departments that participated in the study.

Table 10. Challenges faced by Nigeria LIS academics when using OER

S/N	Challenges of Access to, and Use of Open Educational Resources	Level of Agreement			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	The contents I'm interested in are not much in the OER repository	11(8.3%)	22(16.5%)	70(52.6%)	30(22.5%)
2.	The quality of the contents in the OER repository is not high.	16(12.0%)	5(3.8)	62(46.6%)	50(37.5%)
3.	The contents in the OER repository don't cover all the disciplines	10 (7.5%)	11(8.3%)	90(67.6%)	22(16.5%)
4.	The update of the OER repository is not in time.	123(92.5%)	10(7.5%)	0(0%)	0(0%)
5.	There are no friendly interactive interfaces in the OER repository	10 (7.5%)	11(8.3%)	88(66.2%)	24(18.1%)
6.	I don't have much time to use OER	10(7.5%)	14(10.5%)	100(75.2%)	9(6.8%)
7.	There are no OER-related links on my school website.	15(11.3%)	6(4.5%)	90(67.6%)	22(16.5%)
8	It is too slow to download OER, wasting too much time.	103(77.4%0	27(20.3%)	2(1.5%)	1(0.8%)
9	It is very difficult and laborious to search for OER on websites.	34(25.5%)	33(24.8%)	33(24.8%)	33(24.8%)
10	Incessant power outage is a great stumbling block to accessing OER.	129(96.9%)	4(3.0%)	0(0%)	0(0%)

The results presented in Table 10 identify prominent challenges faced by LIS academics when accessing and using OER. These challenges include incessant power outages, untimely updates of the OER repository, and the significant amount of time required to search for OER in institutional repositories. These issues were acknowledged by a considerably large percentage of respondents who strongly agreed or agreed that these factors pose significant obstacles. Conversely, respondents strongly disagreed that time constraints, the inability of OER repository contents to cover all disciplines, the absence of OER-related links on the school website, and a non-friendly interactive interface

in the OER repository are challenges when using OER. These findings suggest that incessant power outages, untimely modification of the OER repository, and the time-consuming process of searching for OER in institutional repositories are the primary challenges encountered by LIS academics when using OER.

Discussion

This study revealed that office documents such as Word and PowerPoint, open textbooks, lecture notes, quizzes and tutorials, MOOCs, learning modules, and open courseware are the OER resources accessible to LIS academics. These resources are not only accessible but also actively accessed and utilised by LIS academics. This finding aligns with the report by Mckerlich, Ives, and McGreal (2013), which identified scholarly journals, videos, images, textbooks, and audio as common types of OER used by respondents in their study. The results might indicate that respondents find these identified OER easier and more straightforward to use or perhaps they are the most readily available in their institutional repositories. Regardless of the reason, this study confirms that office documents, open textbooks, lecture notes, quizzes and tutorials, and other resources reported here are the most accessible and frequently utilised OER among LIS academics.

Furthermore, mobile phones and laptop computers emerged as the primary devices used by LIS academics for accessing OER. The rationale behind this observation is clear. In this region, mobile phones are the most affordable devices for accessing OER compared to alternatives such as tablets, desktops, or palmtops. Additionally, academic staff are not typically provided with devices by their employers to facilitate OER usage. Instead, individuals must independently source and purchase their devices. Considering the modest salaries earned by LIS academics (Ukwoma & Onyebinama, 2020), acquiring more expensive devices like laptops, palmtops, or tablets might be financially challenging. These factors likely explain the preference for mobile phones when accessing OER. The study also found that OER are primarily utilised by LIS academics for teaching and learning, workshops, seminars, conference presentations, preparation of class notes, and research. This finding aligns with Inegbedion and Opateye (2018), who reported that academic staff predominantly adapt OER for academic purposes. The academic purposes highlighted by these authors, including teaching and learning, workshops, seminars, conference presentations, and class notes, correspond closely with the findings of this study. Similarly, the Commonwealth of Learning (2017) report indicated that teachers surveyed from institutions across Commonwealth countries utilised OER directly in teaching and learning and to supplement existing lessons. This observation further corroborates the findings of the present study.

The effects of OER on LIS academics include the knowledge that their materials may be used by other colleagues and the ability to customise course materials to create a ‘perfect’ course packet or textbook, among other benefits. This finding aligns with previous related studies. For instance, Ani, Ngulube, and Onyancha (2015) found that accessibility and use of electronic resources had a significant perceived positive effect on research productivity. Additionally, the findings by Dhanarajan and Abeywardena (2013) corroborate the benefits that Asian academic institutions can derive from accessing and utilising OER. These benefits include improved access to high-quality resources, enhanced scientific research and education as publicly open activities, reduced course development costs for institutions, outreach to underserved communities, support for developing nations, independence from publishers, creation of more flexible materials, research and development, and the establishment of long-lasting partnerships. Although the impacts identified in this study differ slightly from those reported in these two related studies, all three studies confirm that there are significant effects associated with accessing and using OER. Variations in perception may account for these differences, as no two individuals interpret the same phenomenon identically. Similarly, differences might stem from the context of the studies, with one conducted in Asia and the other two in Nigeria. The effects reported in the Nigerian study are more aligned with the findings of this study, while the Asian context presents notable differences. Furthermore, Wright and Raju (2012) reported that OER enable lecturers to find relevant teaching content from around the world. This accessible content introduces dynamism into the teaching and learning process, making it more participatory and engaging.

Policies are in place to guide the use of OER in the universities where the LIS departments that participated in this study are located. These policies include equal access, protection of intellectual property rights, and open licences, such as Creative Commons. From the collected data, it is evident that there is a general understanding among respondents that policies exist to guide the use of OER. However, respondents appear to lack clarity about what these policies specifically cover or exclude. This may be attributed to differences in institutional policies across universities. Policies play a crucial role in promoting initiatives in higher education institutions. It is not surprising, therefore, that while some participating institutions currently have well-defined policy guidelines on the use of OER, others do not. Anderson, Gaines, Leachman, and Williamson (2017) identified the absence of policies as one of the significant challenges to OER adoption. This underscores the importance of institutional policies in effectively guiding the use and adoption of OER in higher education settings.

The findings revealed that the primary challenges LIS academics encountered when using OER include incessant power outages, untimely modification of the OER repository, and spending excessive time searching for OER in institutional repositories. The Open Pedagogy, Advocacy, and Leadership (OPAL, 2011) study identified five primary obstacles encountered when utilising OER. These obstacles include a lack of institutional support, a lack of technological tools for sharing and adapting resources, a lack of user skills and time, a lack of quality or fitness of resources, and personal issues such as time constraints and lack of trust. These findings are consistent with the results of the current study, reinforcing the understanding that there are indeed significant challenges associated with the use of OER. The findings are further supported by Allen and Seaman (2014), who identified misconceptions about OER among faculty members as a challenge. Similarly, Kahle (2008) reported that some lecturers prioritise proven efficacy and quality when selecting learning materials for their students, while others perceive open-access textbooks to be of lesser quality, which could potentially result in lower learning outcomes. In the same vein, Anderson, Gaines, Leachman, and Williamson (2017) highlighted issues such as copyright concerns, quality assurance, sustainability, interoperability, technical demands, cultural and language barriers, cost, exploitation of labour, and lack of institutional policies and incentives as significant barriers to OER adoption. Additionally, Harley, Lawrence, Acord, and Dixson (2010) identified perceived lack of content quality, time pressures, and loss of compensation for authors as further challenges hindering the effective utilisation of OER. These previous findings collectively align with the results of the present study, underscoring the persistence of these challenges across different educational contexts and reinforcing the need for strategic measures to address them.

Conclusion

The study concludes, based on the findings, that office documents such as Word and PowerPoint, open textbooks, lecture notes, quizzes and tutorials, MOOCs, learning modules, and open courseware are the OER resources highly accessible to LIS academics. Mobile phones and laptop computers are the primary devices used by LIS academics for accessing OER. Furthermore, OER are utilised by LIS academics for teaching and learning, research, preparation for workshops, seminars, conference presentations, and preparation of class notes. The effects of OER on LIS academics include opportunities to use materials created by colleagues and the ability to customise course materials to create a ‘perfect’ course packet or textbook, among other benefits. Policies guiding the use of OER exist in the universities where the LIS academics who participated in the study are based. These policies address issues such as equal access, protection of intellectual property rights, and open licences, including Creative Commons. The identified challenges LIS academics encountered when using OER include incessant power outages, untimely modification of OER repositories, and the time-consuming process of searching for OER in institutional repositories.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Since office documents such as Word and PowerPoint, open textbooks, lecture notes, quizzes and tutorials, MOOCs, learning modules, and open courseware are the OER resources most frequently accessed by LIS academics, efforts should be made to further improve access to these resources. Enhancing accessibility is essential, as effective learning is often facilitated by visual materials.
2. There is a pressing need for institutional support to enhance the adoption and utilisation of OER for academic purposes. LIS academics often face financial challenges in acquiring the necessary devices for accessing OER. Therefore, universities should consider providing these devices free of charge as a form of motivation to encourage further engagement with OER.
3. It was evident in this study that not all participating universities have policies supporting the use of OER. Therefore, individual universities are encouraged to formulate clear and comprehensive policies to guide the use of OER. Such policies are crucial for enhancing the integration of OER into teaching and learning processes, ultimately improving the performance of both LIS academics and students.
4. Incessant power outages (load shedding) have been identified as a major challenge to the effective use of OER. This issue is not unique to this study, as previous literature has consistently highlighted power instability as a common characteristic of developing countries. To address this, universities should consider investing in alternative power-generating systems, such as backup generators or renewable energy solutions, to ensure uninterrupted access to OER.

Limitations and Suggestions

The study is limited in scope because data were collected from fifteen LIS departments (library schools) in fifteen universities across three geopolitical zones in Nigeria, out of a total of 45 LIS departments in universities spanning all six geopolitical zones of the country. Similarly, the selection of fifteen library schools was restricted to three regions rather than encompassing all six geopolitical zones in Nigeria. Future researchers are therefore encouraged to broaden the scope of similar studies to include all LIS departments (library schools) across the six geopolitical zones of Nigeria to ensure more comprehensive and representative findings. Additionally, only one data collection instrument, namely the questionnaire, was employed in this study. Future research should consider combining multiple data collection instruments to enable triangulation of results and facilitate broader generalisation to the total population of LIS academics in Nigerian universities.

References

Allen, E., & Seaman, J. (2014). Opening the curriculum: Open educational resources in US. Babson Survey Research Group.

Almobarraz, A. (2007). Perceived attributes of diffusion of innovation theory as predictors of internet adoption among the faculty members of Imam Mohammed bin Saud University (PhD thesis, University of North Texas, USA). University of North Texas Digital Library. http://digital.library.unt.edu/ark:/67531/metadc3710/

Anderson, T., Gaines, A., Leachman, C., & Williamson, E. P. (2017). Faculty and instructor perceptions of open educational resources in engineering. The Reference Librarian, 58(4), 257-277. https://doi.org/10.1080/02763877.2017.1355768

Ani, O. E., Ngulube, P., & Onyancha, B. (2015). Perceived effect of accessibility and utilization of electronic resources on productivity of academic staff in selected Nigerian universities. SAGE Open, 5(1), 1-7. https://doi.org/10.1177/2158244015571480

Atkins, D. E., Brown, J. S., & Hammond, A. L. (2007). A review of the open educational resources (OER) movement: Achievements, challenges and new opportunities. http://tinyurl.com/

Bliss, T., Hilton, J., Wiley, D., & Thanos, K. (2013). College student and faculty perceptions of the cost and quality of open textbooks. First Monday, 18(1). https://doi.org/10.5210/fm.v18i1.3972

Butcher, N. (2015). A basic guide to open educational resources (OER). United Nations Educational, Scientific and Cultural Organization. https://doi.org/10.56059/11599/36

Butcher, N., & Hoosen, S. (2012). Exploring the business case for open educational resources. Commonwealth of Learning. https://oasis.col.org/items/df93f89e-4697-40a1-886f-49403f6ca232

Cascio, W., & Montealegre, R. (2016). How technology is changing work and organizations. Annual Review of Organizational Psychology and Organizational Behavior, 3(1), 349-375. https://doi.org/10.1146/annurev-orgpsych-041015-062352

Caswell, T., Henson, S., Jensen, M., & Wiley, D. (2008). Open content and open educational resources: Enabling universal education. International Review of Research in Open and Distance Learning, 9(1). https://doi.org/10.19173/irrodl.v9i1.469

Commonwealth of Learning. (2017). Open educational resources: From commitment to action. COL.

Costa, S., & Meadows, J. (2000). The impact of computer usage on scholarly communication among social scientists. Journal of Information Science, 26(4), 255-262. https://doi.org/10.1177/016555150002600406

Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). Sage.

Dhanarajan, G., & Abeywardena, I. S. (2013). Higher education and open educational resources in Asia: An overview. In G. Dhanarajan & D. Porter (Eds.), Open education resources: An Asian perspective (pp. 3-18). Commonwealth of Learning.

Ememe, P. I., & Modebelu, O. J. (2019). Challenges of accessibility and utilization of open education resources (OER) in single and dual mode open education (ODE) institutions in Lagos. International Journal of Educational Research, 6(1), 112-126.

European Commission on Lifelong Learning Programme. (2013). Open educational resources. https://unevoc.unesco.org/home/TVETipedia+Glossary/filt=all/id=576

Goodwin, M. A. L. (2011). The open course library: Using open educational resources to improve community college access (Doctoral thesis, Washington State University, USA).

Guo, Y., Zhang, M., Bonk, C. J., & Li, Y. (2015). Chinese faculty members' open educational resources (OER) usage status and the barriers to OER development and usage. International Journal of Emerging Technologies in Learning, 10(5). https://doi.org/10.3991/ijet.v10i5.4819

Hakim, S. (2017). Supporting access to open education resources and massive open online courses for high school students of New Zealand. E-Learning and Digital Media, 14(4), 244-253. https://doi.org/10.1177/2042753017692724

Harley, D., Lawrence, S., Acord, S. K., & Dixson, J. (2010). Affordable and open textbooks: An exploratory study of faculty attitudes. California Journal of Politics and Policy, 2(1), 1-35. https://doi.org/10.5070/P2D60T

Hayman, J. (2018). Open is an invitation: Exploring the use of open educational resources with Ontario post-secondary educators (Doctoral thesis, Arizona State University, USA).

Hoosen, S., & Butcher, N. (2019). Understanding the impact of OER: Achievements and challenges. UNESCO IITE.

Hylén, J. (2006). Open educational resources: Opportunities and challenges. OECD. https://www.oecd.org/education/ceri/37351085.pdf

Inegbedion, J. O., & Opateye, A. J. (2018). Open educational resources' adaptability and institutional support for lecturers of open and distance education universities in Nigeria. Pakistan Journal of Educational Research and Evaluation, 4(1), 21-32.

Kahle, D. (2008). Designing open educational technology. In J. S. Brown (Ed.), Opening up education: The collective advancement of education through open technology, open content, and open knowledge (pp. 27-45). MIT Press.

Kimmons, R. (2015). OER quality and adaptation in K-12: Comparing teacher evaluations of copyright-restricted, open, and open/adapted textbooks. The International Review of Research in Open and Distributed Learning, 16(5). https://doi.org/10.19173/irrodl.v16i5.2341

Mahajan, P. (2006). Internet use by researchers: A study of Punjab University, Chandigarh. Library Philosophy and Practice, 8(2). http://www.webpages.uidaho.edu/~mbolin/mahajan2.htm

Martin, M., Belikov, O., Hilton, J., Wiley, D., & Fischer, L. (2017). Analysis of student and faculty perceptions of textbook costs in higher education. Open Praxis, 9(1), 79-91. https://doi.org/10.5944/openpraxis.9.1.432

McKerlich, R., Ives, C., & McGreal, R. (2013). Measuring use and creation of open educational resources in higher education. The International Review of Research in Open and Distributed Learning, 14(4). https://doi.org/10.19173/irrodl.v14i4.1573

Miracle, N. (2020). An assessment of open educational resources by students in selected academic institutions in Southwest, Nigeria. Library Philosophy and Practice (e-journal). https://digitalcommons.unl.edu/libphilprac/4356

Njeze, M. (2020). An assessment of open educational resources by students in selected academic institutions in Southwest, Nigeria. Library Philosophy and Practice (e-journal). https://digitalcommons.unl.edu/libphilprac/4356

Onaifo, D. (2016). Alternative academy: Investigating the use of open educational resources by learners at the University of Lagos (Electronic Thesis and Dissertation Repository, 4086). https://ir.lib.uwo.ca/etd/4086

OPAL. (2011). Beyond OER: Shifting focus to open educational practices. Open Education Quality Initiative.

Orwenjo, D. O., & Erastus, F. K. (2018). Challenges of adopting open educational resources (OER) in Kenyan secondary school: The case of open resources for English language teaching (ORELT). Journal of Learning for Development, 5(2), 148-162. https://doi.org/10.56059/jl4d.v5i2.282

Percy, T., & Van Belle, J. P. (2012). Exploring the barriers and enablers to the use of open educational resources by university academics in Africa. IFIP Advances in Information and Communication Technology, 378, 112-128. https://doi.org/10.1007/978-3-642-33442-9_8

Phalachandra, B., & Abeywardena, I. S. (2016). Open educational resources in the Commonwealth 2016. Commonwealth of Learning.

Siemens, G. (2013). MOOCs: How did we get here? [PowerPoint slides]. Society for Learning Analytics Research. Presentation from the 10th Annual Open Education Conference. http://fr.slideshare.net/gsiemens/open-education-2013

Tella, A. (2020). Interactivity, usability and aesthetics as predictors of undergraduates' preference for university library websites. South African Journal of Library & Information Science, 86(2), 16-25. https://doi.org/7553/86-2-1905

Ukwoma, S., & Onyebinama, C. O. (2020). Access and use of open access resources by undergraduate students in federal universities in South East Nigeria. Library Philosophy and Practice (e-journal). https://digitalcommons.unl.edu/libphilprac/4124

UNESCO. (2017). Ljubljana OER action plan 2017. Retrieved October 5, 2019, from https://en.unesco.org/sites/default/files/ljubljana_oer_action_plan_2017.pdf

UNESCO. (2021). Open educational resources. https://en.unesco.org/themes/ict-education/oer

UNESCO. (2022). Accessible open educational resources (OER): Briefing paper. Programme and Meeting Document. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000380471 (Accessed 18 September 2022).

United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. Retrieved October 5, 2019, from https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

Whitfield, S., & Robinson, Z. (2012). Open educational resources: The challenges of 'usability' and copyright clearance. Planet, 25(1), 51-54. https://doi.org/10.11120/plan.2012.00250051

Wright, C. R., & Reju, S. A. (2012). Developing and deploying OER in sub-Saharan Africa: Building on the present. The International Review of Research in Open and Distributed Learning, 13(2), 181-220. https://doi.org/10.19173/irrodl.v13i2.1185

Yuan, L., & Powell, S. (2013). MOOCs and open education: Implications for higher education. A white paper. United Kingdom: JISC-CETIS. Retrieved from http://publications.cetis.org.uk/2013/667

Yuan, L., Macneill, S., & Kraan, W. (2008). Open educational resources - Opportunities and challenges for higher education. JISC CETIS. Retrieved from https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/OER_Briefing_Paper.pdf

Zaid, Y. A., & Alabi, A. O. (2020). Sustaining open educational resources (OER) initiatives in Nigerian universities. Open Learning: The Journal of Open, Distance and e-Learning. https://doi.org/10.1080/02680513.2020.1713738

Zhang, X., Tlili, A., Nascimbeni, F., Burgos, D., Huang, R., Chang, T., Jemni, M., & Khribi, M. (2020). Accessibility within open educational resources and practices for disabled learners: A systematic literature review. Smart Learning Environments, 7(1), 1-19. https://doi.org/10.1186/s40561-019-0113-2