

## Evaluation of Open Educational Resources in National Open University of Nigeria (NOUN) for Improving Students' Learning Outcomes in South-East, Nigeria


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DOI: 10.56201/rjpst.v7.no5.2024.pg66.83

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### **Abstract**

*This study evaluated the availability and utilization of Open Educational Resources (OER) in National Open University of Nigeria (NOUN) for improving students' learning outcomes in South-East geopolitical zone, Nigeria. Three research questions and three hypotheses guided the study. The study adopted descriptive survey research design. The population of the study consisted of 42,200 NOUN students comprising of 13550, 4750, 13200 and 10700 in Enugu, Anambra, Imo and Abia States study centres. Simple randomly sampling technique was used to select one hundred and ninety-eight (198) students comprising of 99 students in Anambra and 99 students in Enugu for the study. A 50-item questionnaire consisting of sections A to D and 5-point rating scale used for data collection was faced validated by three experts. Cronbach alpha statistics was used to determine the reliability coefficient of the instrument which yielded overall reliability index of 0.77 comprising of 0.77, 0.83 and 0.71 for Section B, C and D respectively indicating that the instrument was reliable. The research questions were answered using Mean and Standard Deviation while independent t-test was used to test the hypotheses at .05 level of significance. Findings of the study showed that Open Educational Resources are highly available but lowly utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State. The study also showed inadequate internet service, infrastructure, technical support staff and awareness as the challenges facing NOUN in the utilization of OER for improving students' learning outcomes. From the findings of the study, there was no significant difference between the mean responses of NOUN students in Anambra and Enugu State on availability, utilization and challenges of OER for improving students' learning outcomes. Hence, the researchers recommended that NOUN should organize seminars, workshops, conferences and symposiums on OER dedicated to improving students' learning outcomes.*

**Keywords:** *Open Educational Resources (OER); National Open University of Nigeria (NOUN); Student Engagement; Availability; Utilization*

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## **Introduction**

University education represent the pinnacle of intellectual enlightenment, serving as a bastion of knowledge, exploration, and personal growth. Universities are communities of scholars dedicated to teaching, research, and outreach, going beyond the simple transmission of information to encompass self-discovery, critical thinking, and active engagement with society (Ahmed, 2023). According to Ahmed (2023), universities are considered as public institutions that support the social, cultural, and economic goals of a society by producing competent and globally competitive graduates. Nigeria's commitment to equipping its citizens with the skills and knowledge necessary for socio-economic development is one of the major reasons for the establishment of universities in the country (Akpomi & Nwamadi, 2020; Ojo et al., 2020). According to the Federal Republic of Nigeria (FRN, 2013), a university is an institution of post-secondary education aimed at contributing to national development through advanced manpower training, offering accessible and affordable high-quality learning opportunities in both formal and informal education, tailored to the needs and interests of all Nigerians, and addressing skills gaps by producing qualified professionals aligned with the demands of the job market, among other objectives.

In pursuit of these aims, various universities, including the National Open University of Nigeria (NOUN), are actively engaged in providing functional, adaptable, accessible, and cost-effective teaching and learning methods for Nigerian citizens (Adamu, 2017). The National Open University of Nigeria (NOUN) was established by President Shehu Shagari on 22nd July 1983 and officially recognized under Act No. 6 of 1983, which provided the legal framework for its existence (Onowugbeda, 2020). NOUN, is an Open and Distance Learning (ODL) university recognized by the National Universities Commission (Onowugbeda, 2020; NOUN, 2023). Currently, NOUN offers degree programs across eight disciplinary areas and forty-three (43) programs at the Postgraduate Diploma, Masters, and Doctoral levels, including fields such as Agricultural Sciences, Arts, Education, Health Sciences, Law, Management Sciences, Sciences, and Social Sciences (NOUN, 2023). The university operates in one hundred and fourteen study (114) centres strategically located in State capitals, major towns across all six geo-political zones of Nigeria, and the Federal Capital Territory, Abuja (NOUN, 2023). According to Inegbedion and Opataye (2018), there has been a significant increase in interest regarding the origin, identification, creation, communication, and sharing of knowledge and information globally through ODL.

Muthanga et al. (2023), Obinyan, Okoroafor, and Ezenwuzor (2023), stated that information resources are crucial in supporting teaching and research in academic institutions offering Open and Distance Learning (ODL). This importance was recognized by UNESCO's initiatives such as the launch of the Open Course Ware (OCW) project, the introduction of the first Creative Commons licenses in 2002, and the emergence of Massive Open Online Courses (MOOCs) in 2008 (Chamberlin & Parish, 2011; Olufunke & Adegun, 2014; Olaiya & Umar, 2023). These developments encouraged countries worldwide to release educational materials developed with public funding under open licenses, allowing for their reuse, adaptation, remixing, and redistribution as Open Educational Resources (OER) without requiring permission from copyright holders (UNESCO, 2012; Hodgkinson-Williams & Arinto, 2017; UNESCO, 2019; Christoforidou & Georgiadou, 2021; Oluwayimika & Idoghor, 2023). OER according to Wiley and Hilton (2018), Zimmermann et al (2023), Olaiya and Umar (2023)

Okwu, Ogunbodede and Suleiman (2023), refer to freely accessible and openly licensed educational materials such as documents, audio recordings, textbooks, lecture notes, videos, interactive modules, social networking tools, and multimedia applications that can be used, shared, and modified by educators and learners.

In compliance with the UNESCO directive to enhance access to affordable learning opportunities, the Federal Ministry of Education (FME) of Nigeria introduced the Nigerian Higher Education Open Educational Resources (NgHEOER) initiative (Itasanmi, 2020; Olaiya & Umar, 2023). This initiative required all higher education institutions to develop institutional OER policies aligned with national guidelines. It also mandated the creation of institutional repositories to disseminate teaching, learning, and research materials online, aiming to broaden access and support high-quality education and research (OER Policy, 2017; FGN, 2017). As a result of this policy, the National Universities Commission (NUC) organized two meetings on August 21, 2017, and September 12, 2017, to promote the adoption of Open Educational Resources (OER). This effort led to the establishment of the Nigeria University System Open Education Resources (NUSOER) website ([www.nusoer.org](http://www.nusoer.org)) on August 17, 2017, which became mandatory for all universities nationwide to link to (Commonwealth of Learning, 2017; NUC, 2017; Ojo et al., 2020).

The National Open University of Nigeria (NOUN) has been at the forefront of OER adoption in the country through its NOUN-OER unit, established in August 2014 (NOUN, 2016). This unit was formally inaugurated in October 2015 with the objectives to promote awareness of Open Educational Resources within NOUN and beyond, establish an open licensing framework within NOUN, contribute to global OER repositories, foster research and collaboration in OER, provide capacity building in OER practices, offer high-quality open licensed Massive Open Online Courses (MOOCs) globally, and collaborate with national and international organizations on OER initiatives (NOUN, 2016; NOUN, 2023). According to NOUN (2016), publications released on the NOUN-OER website are available under the Attribution-ShareAlike 4.0 (CC-BY-SA 4.0) license. Users are required to adhere to the terms of use specified in the NOUN-OER repository, which are provided in various formats for easy accessibility: Open Document Text (ODT) for immediate reuse by students and academics outside NOUN, Portable Document Format (PDF) for computer use and self-printing, and ePub format for reading on tablets and smartphones (NOUN, 2016).

Numerous studies have reported the benefits of OER, including cost reduction in learning (Hilton, 2016), increased accessibility to educational materials, including for students with disabilities (Zhang et al., 2020), and enhancement of learning quality (Yuan & Recker, 2015; Weller et al., 2015; Inegbedion & Opatye, 2018; Hilton et al., 2019; Zhang et al., 2020). Issa et al. (2020), Ahmed (2023), and Obinyan, Okoroafor, and Ezenwuzor (2023), observed that the use of OER depends on both the frequency with which educators deposit digitized resources into OER repositories and how co-educators and students reuse, revise, remix, and redistribute these shared OER. In the view of Huang et al. (2020), Cheung, Wong and Li (2023), collaborative development and sharing of Open Educational Resources (OER) enable educators to access a wide array of materials tailored to specific teaching contexts and student needs. The widespread availability of learning modules and video streaming, online lecture materials, open courseware, e-books, syllabi, Open Access Electronic Theses (OAET), open textbooks, open access journals, and course videos/YouTube among students has made access to OER feasible (Ambrose, Akporhonor & Eka, 2023). Wolfenden et al. (2017) suggest that the creation and uploading of OER into university repositories should match the downloading and utilization by both lecturers and students alike.

The utilization of OER extends beyond simply uploading resources to university OER repositories; it includes downloading shared OER for specific teaching, learning, and research purposes (Wiley & Hilton, 2018)). Venegas-Muggli and Westerman (2019) found improved academic performance among students exposed to OER compared to those relying solely on traditional textbooks. However, despite the growing utilization of OER in developed nations, several research revealed low utilization among students in Nigerian universities, highlighting challenges in acceptance by lecturers and subsequent adoption by students (Akomolafe & Olajire, 2014; Ojo, 2020; Igbinovia, Obinyan & Okumode, 2022; Ahmed, 2023). According to Ayodele and Ogbiye (2018) and Okon et al. (2020), achieving educational goals may hinge on the effective utilization of educational resources. Ememe and Modebelu (2019), Obinyan, Okoroafor, and Ezenwuzor (2023), Olaiya and Umar (2023), identified Coursera, EdX, TED-Ed, MERLOT, Courseware, and OpenStax, videos and animation as the most popular Open Educational Resources (OER) utilized by university students in Nigeria.

Despite the potential advantages of OER, several challenges impede their widespread adoption in Nigerian educational institutions (Olaiya & Umar, 2023). Issues such as inadequate infrastructure and limited internet access in certain regions of Nigeria constrain students' consistent access to online educational resources (Zaid & Alabi, 2021). Gambo and Sani (2017) and Olaiya and Umar (2023) highlighted that lack of awareness and understanding among educators and students about OER also hampers their uptake. Additionally, Zaid and Alabi (2021), Olaiya and Umar (2023), Idowu, Simisaye, and Okiki (2023) pointed out challenges including the absence of institutional policies and support systems, unclear guidelines and incentives for educators, difficulties in editing and localizing OER, and the lack of a sustainable funding model, which limit the scalability and long-term viability of OER in Nigerian universities. Furthermore, Olaiya and Umar (2023) noted that inadequate digital literacy skills and insufficient knowledge to assess the quality of OER are additional barriers hindering effective OER utilization among the students. In the light of these challenges, this study aims to assess the impact of Open Educational Resources (OER) on enhancing student learning outcomes at the National Open University of Nigeria (NOUN) in the South-East geopolitical zone of Nigeria.

### **Statement of the Problem**

The integration of Open Educational Resources (OER) into educational practices has gained global attention as a solution to issues related to access, affordability, and quality in higher education. Issa et al (2020), stated that the availability and use of OER in universities present an opportunity to enhance students' learning experiences. Despite the growing adoption of Open Educational Resources (OER) in higher education institutions globally, there is limited empirical evidence on the extent to which OER are available and utilized in Nigerian universities to improve students' academic performance, engagement, and overall learning experience, particularly in the South-East geopolitical zone. Oluwayimika and Idoghor (2023) stated that "Students still continue to struggle with using online learning and research platforms to address and respond to their research demands.

According to Zaid and Alabi (2020), Idowu, Simisaye, and Okiki (2023), several challenges hindering the effective adoption of OER in Nigerian universities, includes inadequate awareness, limited internet access, the absence of institutional policies and support systems, unclear guidelines and incentives for educators, and the lack of a sustainable funding model for OER. The National Open University of Nigeria (NOUN) as a pioneering institution in distance education, serves a diverse student population often facing challenges that impact their educational experiences and outcomes. Currently, there is limited empirical evidence on



the extent to which OERs are available and utilized at NOUN to improve students' academic performance, engagement, and overall learning experience. Therefore, this study seeks to address this gap by evaluating the availability and utilization of Open Educational Resources (OER) at the National Open University of Nigeria (NOUN) with the aim of enhancing students' learning outcomes in the South-East geopolitical zone of Nigeria.

### **Purpose of the Study**

The main purpose of the study was to examine the availability and utilization of OER in NOUN for improving students' learning outcomes in South-East geopolitical zone in Nigeria. Specifically, the study sought to assess the:

1. Open Educational Resources available in NOUN for improving students' learning outcomes in Anambra and Enugu State.
2. Extent to which Open Educational Resources are utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State.
3. Challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State.

### **Research Questions**

The following research questions guided the study:

1. What are the Open Educational Resources available in NOUN for improving students' learning outcomes in Anambra and Enugu State?
2. To what extent are Open Educational Resources utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State?
3. What are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State?

### **Research Hypotheses**

The following hypotheses were generated and tested at 0.05 level of significance.

- H01: There is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on Open Educational Resources available for improving students' learning outcomes.
- H02: There is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on Open Educational Resources utilized for improving students' learning outcomes.
- H03: There is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes.

### **Review of Empirical Studies**

This section presents the range of previous empirical studies related to this research. Research conducted by Ahmed (2023), assessed lecturers' acceptance, usage, and attitudes toward Open Educational Resources (OER) for knowledge sharing in universities in North-East Nigeria. The study population was of 632 lecturers from Federal Universities in the region, with a sample size of 338 lecturers purposively selected from three institutions. The study adopted concurrent embedded mixed method research design in which eight quantitative and two qualitative research questions guided the study with eight null hypotheses. The instruments used for data collection were closed ended questionnaire and focus group interview protocol. The instruments were validated by experts and subjected to reliability test using Cronbach's

alpha and a reliability coefficient of .956 was obtained. For the focus group interview protocol, Cohen's  $\kappa = .611$  and .688 was obtained for lecturers' attitude toward knowledge sharing and the use of shared OER.

Ahmed (2023), analyzed quantitative data using simple percentages, means, and standard deviations, while thematic analysis with Atlas ti. Version 9.0 was employed for qualitative data. Sequential multiple linear regression analysis in SPSS version 23.0 tested hypotheses at a significance level of 0.05. Results indicated that lecturers' acceptance and use of OER were influenced by factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions. Specifically, performance expectancy, effort expectancy, and social influence significantly correlated positively with lecturers' willingness to share and use OER. However, facilitating conditions did not predict lecturers' acceptance to share resources on OER repositories. The study recommended adjustments to university OER policies, including integrating career progression incentives such as promotions, book and courseware development projects, and special awards for community service, to sustain OER initiatives in North-Eastern universities.

Similarly, Obinyan, Okoroafor and Ezenwuzor (2023) conducted a study to assess the awareness and utilization of Open Educational Resources (OER) among students in selected conventional universities. They distributed a structured questionnaire to 600 respondents and found that students were generally aware of OER at their universities. The study identified a positive relationship between students' awareness of OER and their actual usage. The study revealed that a majority of students utilized theses/projects, journal articles, lecture notes, courseware, and books, while video content, inaugural lectures, and conference proceedings/presentations were among the least utilized resources, each by over 50% of respondents. The study also indicated that 80% of respondents perceived these resources as beneficial, improving their retention of course materials, and 89.3% found the process of downloading materials to be straightforward. The study identified several barriers to the effective use of OER among students, including inadequate skills in navigating OER platforms, limited knowledge of available courseware, and inconsistent power supply. The study recommended continuous training and retraining of both students and staff to enhance ICT literacy skills and competence, ensuring maximum utilization of OER. Additionally, it suggested collaboration between universities and librarians to develop standardized procedures for integrating OER into teaching, learning, and research processes to facilitate their practical application.

In the same vein, Ambrose, Akporhonor, and Eka (2023) conducted a study examining the attitudes of postgraduate students towards the use of Open Educational Resources (OER) at the National Open University of Nigeria (NOUN) in the South-south geopolitical zone of Nigeria. Three hypotheses on postgraduate students' perceptions and utilization of OER were tested. The study employed descriptive survey design with population of 2,119 postgraduate students. From the population, 318 students were selected using stratified random sampling techniques. Data were collected through a questionnaire and analyzed using descriptive statistics for demographic information and inferential statistics to test the hypotheses. The findings indicated that postgraduate students exhibited a positive attitude towards the use of OER. The OER most frequently utilized by these students included learning modules and video streaming, online lecture materials, open courseware, e-books, syllabi, Open Access Electronic Theses (OAET), open textbooks, open access journals, and course videos/YouTube. The study also determined that there was no significant difference in the utilization of OER across different faculties. Additionally, it found that attitude significantly influenced the usage of OER among postgraduate students. Based on these results, the study concluded that increasing

awareness and fostering positive attitudes are essential for promoting the use of OER among postgraduate students.

Also, Issa et al. (2020) conducted a study to assess the extent of Open Educational Resources (OER) utilization among undergraduate students in universities in Kwara State. Using a descriptive survey design, the study encompassed all undergraduate students from six universities in the state. A total of 398 respondents were randomly sampled from the institutions, with an additional three purposively selected based on their areas of specialization. Hypothesis one was evaluated using independent t-tests, while hypothesis two was tested using ANOVA. The study's findings revealed that a significant percentage of undergraduates did not utilize many of the listed OER resources. Moreover, there was a notable difference in the utilization of OER based on gender and area of specialization among undergraduates. The study concluded that while some OER sites were used moderately, overall adoption of many identified resources was low.

The researchers emphasized that increasing awareness and utilization of OER among undergraduates could enhance their learning processes and the quality of their studies. The research recommended that lecturers play a pivotal role in encouraging students to leverage OER to support their learning and improve their research efforts. While previous studies have provided direction on lecturers' and students acceptance, awareness and utilization, attitudes toward OER with different trajectories at the institutional level (Issa et al., 2020; Ahmed, 2023; Obinyan, Okoroafor & Ezenwuzor, 2023; Ambrose, Akporhonor, & Eka, 2023), the present study focused on evaluating the availability, utilization and challenges of Open Educational Resources (OER) in National Open University of Nigeria (NOUN) for improving students' learning outcomes in South-East geopolitical zone, Nigeria.

### **Research Methodology**

This section outlined the research framework, including the design, area, population, instrument validation and reliability, data collection, analysis methods, and decision criteria for evaluation of the effectiveness of Open Educational Resources (OER) in National Open University of Nigeria (NOUN) for improving students' learning outcomes in South-East geopolitical zone in Nigeria. The study adopted descriptive survey research design. According to Nworgu (2015), Johnny, Effiong and Sheik (2020), survey research design aims to systematically collect and describe data concerning the characteristics, features, or facts about a given population. The four study centres in the South East include Anambra (Abagana), Abia State (Umudike), Enugu and Imo State (Nekede).

A population of 42,200 students consisting of 13550, 4750, 13200 and 10700 in Enugu, Anambra, Imo and Abia States respectively was used for the study. Population according to Bornstein, Jager and Putnick (2013), is the entirety of all elements under observation, which constitutes all things in any field of investigation. In the same vein, a sample size of one hundred and ninety-eight (198) students consisted of 99 and 99 students in Anambra and Enugu respectively were randomly selected for the study. A sample according to Taherdoost (2016), refers to a section or subset of the study population chosen for investigation through a sampling process. In the same vein, Nardi (2018), stated that sampling technique is essential for estimating the required data volume and comprehending the data gathering process within a population to fulfill the study objectives. This study's sample size was determined using the Taro Yamane sample model. According to Islam (2018), the Yamane formula provides a simplified formula to calculate sample sizes.

The data for the study were gathered from both primary and secondary sources. The primary data were collected using questionnaire while the secondary data were gathered from

text books, journals and online materials (Google Scholar, Research Gates, Scopus, among others). The researchers developed a 50-item structured questionnaire titled: Availability and Utilization of OER in NOUN (AUOERNOUN) Questionnaire. Questionnaire according to Nardi (2018) is the most common instrument or technique used to acquire descriptive data from a sample group in survey research because the respondents have the advantage of supplying data and information from the source. The instrument was divided into four sections; A – D. Section A comprised of items eliciting information on staff demographic data, while sections B – D comprised of items on availability, utilization and challenges facing OER in NOUN. The instrument was designed with a 5-point rating scale of Very Highly Available (VHA=4.50-5.00), Highly Available (HA=3.50-4.49), Moderately Available (MA=2.50-3.49), Lowly Available (LA=1.50-2.49), Not Available (NA=1.00-1.49) for research question 1, Very Highly Utilized (VHU=4.50-5.00), Highly Utilized (HU=3.50-4.49), Moderately Utilized (MU=2.50-3.49), Lowly Utilized (LU=1.50-2.49), Not Utilized (NU=1.00-1.49) for research question 2, Strongly Agreed (SA= 4.50-5.00), Moderately Agreed (MA = 3.50-4.49), Lowly Agreed (LA=2.50 - 3.49), Not Agreed (NA=1.50 - 2.49) and Undecided (U=1.00-1.49) was used answer research question 3.

In order to establish the validity of the instrument, copies of the instrument were given to two experts in the Department of Measurement and Evaluation, University of Uyo, Akwa Ibom State and one expert in Department of Department of Educational Technology in the University of Ilorin, Ilorin for face validation. To ensure the reliability of the instrument, it was trial-tested on 20 students who were not part of the study. Cronbach alpha statistics was used to determine the reliability coefficient of the instrument which yielded overall reliability index of 0.77 comprising of 0.77, 0.83 and 0.71 for Section B, C and D respectively indicating that the instrument was reliable. Cronbach’s alpha test according to Taber (2017) is the most commonly used method to assess the accuracy of scales with value between 0 and 1. Cronbach’s alpha coefficient should be between 0.7 and above to demonstrate the scale’s reliability (Cronbach, 1951).

The administration of the instrument was done with the assistance of three research assistants who were briefed before administration of the instrument to the students. A letter of information and consent were part of the information provided to the students. Since the questionnaire was distributed face to face, the participants read the letter of information and consent form and confirmed their voluntary participation. The one hundred and ninety-eight (198) copies of the questionnaire administered were all retrieved, indicating a 100% instrument retrieval. Mean scores and Standard Deviation were used in answering the research questions while t-test statistics was used to test the three null hypotheses at .05 level of significance. The data collected were analyzed using Statistical Package for the Social Sciences 26 (SPSS).

## Presentation of Results

**Research Question 1:** What are the OER available in NOUN for improving students’ learning outcomes in Anambra and Enugu State?

**Table 1:** *OER available in NOUN for improving students’ learning outcomes in Anambra and Enugu State.*

S/N	SECTION B: Availability of OER in NOUN	Anambra (N=99)			Enugu (N=99)		
		$\bar{x}$	SD	Dec.	$\bar{x}$	SD	Dec.
1.	NOUN OER Repository	3.81	0.76	HA	4.03	1.17	HA
2.	MIT OpenCourseWare	4.13	1.28	HA	3.77	0.81	HA
3.	Coursera	3.94	0.66	HA	3.71	0.89	HA
4.	TED-Ed	3.62	1.19	HA	3.62	1.13	HA



5.	MERLOT	3.75	1.06	HA	3.75	0.83	HA
6.	edX	4.38	1.31	HA	4.81	1.37	HA
7.	British Library Digital Collections	4.16	0.84	HA	3.55	0.90	HA
8.	OpenStax	3.58	0.87	HA	3.63	0.69	HA
9.	Khan Academy	4.31	1.64	HA	3.50	0.88	HA
10.	UNESCO-OER	3.64	0.81	HA	4.12	0.89	HA
11.	National Science Digital Library (NSDL)	3.92	1.32	HA	3.84	1.21	HA
12.	Wikibooks	4.27	0.91	HA	4.39	0.85	HA
13.	FutureLearn	3.97	0.86	HA	4.10	1.77	HA
14.	OpenLearn	4.43	0.82	HA	3.78	0.81	HA
15.	NASA Open Educational Resources	3.49	0.71	HA	3.94	0.55	HA
16.	Wikimedia Commons	3.51	1.88	HA	4.33	0.74	HA
17.	Project Gutenberg	4.22	1.84	HA	3.61	1.72	HA
18.	Wikiversity	3.95	0.73	HA	4.22	0.66	HA
19.	Codecademy	4.33	0.92	HA	3.56	1.83	HA
20.	Smithsonian Learning Lab	3.59	0.81	HA	4.37	0.75	HA
<b>Grand Mean and Standard Deviation</b>		<b>3.95</b>	<b>1.06</b>	<b>HA</b>	<b>3.93</b>	<b>1.02</b>	<b>HA</b>

**\*NOTE:** VHA (4.50-5.00), HA (3.50-4.49), MA (2.50-3.49), LA (1.50-2.49), NA (1.00-1.49)

The analyzed data in Table 1 showed the mean response of students on OER available in NOUN for improving students' learning outcomes in Anambra and Enugu State. The respondents Mean ranged from 3.51 to 4.81 with grand Means of 3.95 and 3.93 for Anambra and Enugu State NOUN study centres respectively. The Anambra and Enugu State students response to research question one implies that NOUN OER Repository, MIT OpenCourseWare, Coursera, TED-Ed, MERLOT, edX, British Library Digital Collections, OpenStax, Khan Academy, UNESCO-OER, National Science Digital Library (NSDL), Wikibooks, FutureLearn, OpenLearn, NASA Open Educational Resources, Wikimedia Commons, Project Gutenberg, Wikiversity, Codecademy and Smithsonian Learning Lab are highly available in NOUN for improving students' learning outcomes in Anambra and Enugu State.

**Research Question 2:** To what extent are OER utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State?

**Table 2:** OER utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State.

S/N	SECTION C: Utilization of OER in NOUN	Anambra (N=99)			Enugu (N=99)		
		$\bar{x}$	SD	Dec.	$\bar{x}$	SD	Dec.
1.	I utilize NOUN-OER repository to access educational resources.	2.47	0.81	LU	2.38	0.52	LU
2.	I use MIT OpenCourseWare to access course materials and lecture notes in my disciplines.	2.38	0.63	LU	2.47	0.77	LU
3.	I use Coursera courses for self-paced learning on relevant course materials, quizzes, and assignments.	2.41	0.86	LU	2.43	0.51	LU
4.	I use TED-Ed lessons and talks for exploration of interdisciplinary topics across various subject areas	1.87	0.85	LU	2.49	0.90	LU
5.	I can search MERLOT's extensive collection of peer-reviewed OER materials.	2.18	0.59	LU	2.39	0.88	LU
6.	I can utilize edX courses, lectures, and interactive learning activities to supplement classroom instruction.	2.49	0.84	LU	1.93	0.67	LU

7.	I can access the British Library digital collections to support research, inquiry, and interdisciplinary learning	2.44	0.67	LU	2.36	0.85	LU
8.	I can use OpenStax textbooks with customizable educational materials.	2.26	0.92	LU	1.81	0.59	LU
9.	I can incorporate Khan Academy videos and interactive exercises to provide additional explanations of complex topics.	1.97	0.88	LU	1.91	0.62	LU
10.	I can access UNESCO-OER Platform to discover and share open-access educational resources.	1.79	0.74	LU	2.40	0.66	LU
11.	I can access NSDL's digital library of STEM resources.	2.38	0.89	LU	2.41	0.52	LU
12.	I can explore Wikibooks' collaborative textbooks and educational resources in various subject areas.	2.43	0.58	LU	1.73	0.71	LU
13.	I can use FutureLearn courses for self-paced learning and professional development.	2.48	0.49	LU	2.31	0.54	LU
14.	I can integrate OpenLearn courses from Open University into the curriculum for diverse subject areas	2.28	0.80	LU	1.84	0.70	LU
15.	I can incorporate NASA's OER materials in STEM learning	2.42	0.83	LU	2.37	0.61	LU
16.	I can utilize Wikimedia Commons vast repository to enhance presentations, lectures, and course materials	2.45	0.87	LU	2.30	0.64	LU
17.	I use Project Gutenberg's collection of free eBooks for accessing classic literature, historical texts, and primary sources in the public domain	1.67	0.55	LU	2.33	0.48	LU
18.	I use Wikiversity open-access platform for creating, sharing, and exploring educational resources and projects	2.40	0.71	LU	2.47	0.67	LU
19.	I can use Codecademy's interactive coding tutorials and projects for developing programming skills and computational thinking.	2.39	0.88	LU	1.77	0.73	LU
20.	I can explore the Smithsonian Learning Lab digital resources to integrate museum-based learning experiences.	2.47	0.67	LU	2.44	0.69	LU
<b>Grand Mean and Standard Deviation</b>		<b>2.28</b>	<b>0.75</b>	<b>LU</b>	<b>2.23</b>	<b>0.66</b>	<b>LU</b>

\*NOTE: VHU (4.50-5.00), HU (3.50-4.49), MU (2.50-3.49), LU (1.50-2.49), NU (1.00-1.49)

The analyzed data in Table 2 showed the mean response of students on OER utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State. The respondents Mean ranged from 1.67 to 2.49 with grand Means of 2.28 and 2.33 for Anambra and Enugu State NOUN study centres respectively. The Anambra and Enugu State students response to research question two implies that NOUN OER Repository, MIT OpenCourseWare, Coursera, TED-Ed, MERLOT, edX, British Library Digital Collections, OpenStax, Khan Academy, UNESCO-OER, National Science Digital Library (NSDL), Wikibooks, FutureLearn, OpenLearn, NASA Open Educational Resources, Wikimedia Commons, Project Gutenberg, Wikiversity, Codecademy and Smithsonian Learning Lab are lowly utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State.

**Research Question 3:** What are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State?

**Table 3:** Challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State.

S/N	SECTION D: Utilization Challenges of OER in NOUN	Anambra (N=99)			Enugu (N=99)		
		$\bar{x}$	SD	Dec.	$\bar{x}$	SD	Dec.
1.	Inadequate access to internet which is essential for utilizing Open Educational Resources	4.49	0.79	MA	4.51	0.58	SA
2.	Insufficient computers, tablets, and smartphones hinders students' ability to access OER	4.57	0.76	SA	4.76	0.66	SA
3.	Inadequate skills to effectively use digital tools and platforms	4.84	0.68	SA	4.53	0.57	SA
4.	Inadequate infrastructure in such as electricity to support the use of OER	4.71	0.77	SA	4.85	0.83	SA
5.	Inadequate awareness about the existence and benefits of OER among students	4.55	0.89	MA	3.73	0.75	SA
6.	Inadequate technical support staff	3.80	0.55	SA	4.76	0.71	MA
7.	Insufficient training opportunities for students to learn how to integrate OER into their learning practices	3.92	0.73	MA	3.61	0.84	MA
8.	Many OER materials are not available in local languages, making them less accessible to students	4.74	0.69	MA	3.72	0.78	SA
9.	OER content are not always culturally relevant to the specific educational needs of the students	4.68	0.86	SA	4.57	0.59	SA
10.	Challenges in aligning OER with the existing curriculum standards and learning objectives	3.83	0.68	MA	3.70	0.77	MA
<b>Grand Mean and Standard Deviation</b>		<b>4.41</b>	<b>0.74</b>	<b>MA</b>	<b>4.27</b>	<b>0.71</b>	<b>MA</b>

\*NOTE: SA (4.50-5.00), MA (3.50-4.49), LA (2.50-3.49), NA (1.50-2.49), U (1.00-1.49)

The analyzed data in Table 3 showed the mean response of students on the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State. The respondents Mean ranged from 3.70 to 4.85 with grand Means of 4.41 and 4.27 for Anambra and Enugu State NOUN study centres respectively. The analyzed data showed that the students strongly agreed that insufficient computers, inadequate skills, infrastructure and lack of cultural relevance are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State. Specifically, Anambra study centre moderately agreed that technical support staff, training opportunities and aligning OER with the existing curriculum standard and learning objective are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes. Similarly, Enugu study centre moderately agreed that inadequate internet service, awareness, insufficient training, non-availability of OER in local languages and aligning with existing curriculum are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes.

**Hypothesis 1:** There is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on OER available for improving students' learning outcomes.

**Table 4:** *t-test analysis of the mean scores of NOUN students in Anambra and Enugu State on OER available for improving students' learning outcomes.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
Anambra Study Centres	99	3.95	1.06	196	0.07	1.98	NS
Enugu Study Centres	99	3.93	1.02				

Note, NS = Not Significant

From Table 4, the calculated t-value is 0.07 ( $t_{cal}=0.07$ ) and the critical t-value is 1.98 ( $t_{crit}=1.98$ ) at 196 degrees of freedom and at 0.05 level of significance. Since the  $t_{crit}=1.98$  is greater than the  $t_{cal}=0.07$ , the null hypothesis is upheld; indicating that there is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on OER available for improving students' learning outcomes. This implies that NOUN OER Repository are highly available in NOUN for improving students' learning outcomes in Anambra and Enugu State.

**Hypothesis 2:** There is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on OER utilized for improving students' learning outcomes.

**Table 5:** *t-test analysis of the mean scores of NOUN students in Anambra and Enugu State on OER utilized for improving students' learning outcomes.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
Anambra Study Centres	99	2.28	0.75	196	0.28	1.98	NS
Enugu Study Centres	99	2.33	0.66				

Note, NS = Not Significant

From Table 5, the calculated t-value is 0.28 ( $t_{cal}=0.28$ ) and the critical t-value is 1.98 ( $t_{crit}=1.98$ ) at 196 degrees of freedom and at 0.05 level of significance. Since the  $t_{crit}=1.98$  is greater than the  $t_{cal}=0.28$ , the null hypothesis is upheld; indicating that there is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on OER utilized for improving students' learning outcomes. This implies that NOUN OER Repository are lowly utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State.

**Hypothesis 3:** There is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes.

**Table 6:** *t-test analysis of the mean scores of NOUN students in Anambra and Enugu State on the challenges facing NOUN in the utilization of OER for improving students' learning outcomes.*

Variable	N	$\bar{x}$	SD	df	t-cal.	t-value	Decision
Anambra Study Centres	99	4.41	0.74	196	1.4	1.98	NS
Enugu Study Centres	99	4.27	0.71				

Note, NS = Not Significant

From Table 6, the calculated t-value is 1.40 ( $t_{cal}=1.40$ ) and the critical t-value is 1.98 ( $t_{crit}=1.98$ ) at 196 degrees of freedom and at 0.05 level of significance. Since the  $t_{crit}=1.98$  is greater than the  $t_{cal}=1.40$ , the null hypothesis is upheld; indicating that there is no significant



difference between the mean responses of NOUN lecturers in Anambra and Enugu State on the challenges facing NOUN in the utilization of OER for improving students' learning outcomes. This implies that all the items are challenges facing the utilization of OER in NOUN for improving students' learning outcomes in Anambra and Enugu State.

### **Discussion of Findings**

The findings of the study for research question one showed that Open Educational Resources (OER) are lowly available in NOUN for improving students' learning outcomes in Anambra and Enugu State. The Anambra and Enugu State students' response to research question one implies that NOUN OER Repository, MIT OpenCourseWare, Coursera, TED-Ed, MERLOT, edX, British Library Digital Collections, OpenStax, Khan Academy, UNESCO-OER, National Science Digital Library (NSDL), Wikibooks, FutureLearn, OpenLearn, NASA Open Educational Resources, Wikimedia Commons, Project Gutenberg, Wikiversity, Codecademy and Smithsonian Learning Lab are highly available in NOUN for improving students' learning outcomes in Anambra and Enugu State. The corresponding hypothesis one revealed that there is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on OER available for improving students' learning outcomes. This finding aligned with the findings of Idowu, Simisaye and Okiki (2023) who revealed that level of availability of ICT training for the use of OER in Nigeria is low. Similarly, the finding of the study is in support of Obinyan, Okoroafor and Ezenwuzor (2023), Olaiya and Umar (2023) who stated that the most popular OER available among the Nigeria university students were Coursera, EdX, TED-Ed, MERLOT, Courseware and OpenStax.

The findings of the study for research question two showed that Open Educational Resources (OER) are lowly utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State. The Anambra and Enugu State students' response to research question two implies that NOUN OER Repository, MIT OpenCourseWare, Coursera, TED-Ed, MERLOT, edX, British Library Digital Collections, OpenStax, Khan Academy, UNESCO-OER, National Science Digital Library (NSDL), Wikibooks, FutureLearn, OpenLearn, NASA Open Educational Resources, Wikimedia Commons, Project Gutenberg, Wikiversity, Codecademy and Smithsonian Learning Lab are lowly utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State. The corresponding hypothesis two revealed that there is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on OER utilized for improving students' learning outcomes. This finding aligned with the findings of Ambrose, Akporhonor and Eka (2023), OER mostly used by postgraduate students includes learning modules and video streaming, lecture materials online, open courseware, e-book, syllabi, Open Access Electronic Thesis (OAET), open textbooks, open access journals and course videos/YouTube. Similarly, Ambrose, Akporhonor and Eka (2023), noted no significant difference between male and female users of e-resources for learning. Similarly, the finding of the study is in support of Obinyan, Okoroafor and Ezenwuzor (2023), Olaiya and Umar (2023) who stated that the most popular OER utilized among the Nigeria university students were Coursera, EdX, TED-Ed, MERLOT, Courseware and OpenStax.

The findings of the study for research question three showed the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State. The analyzed data showed that the students strongly agreed that insufficient computers, inadequate skills, infrastructure and lack of cultural relevance are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State. Specifically,

Anambra study centre moderately agreed that technical support staff, training opportunities and aligning OER with the existing curriculum standard and learning objective are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes. Similarly, Enugu study centre moderately agreed that inadequate internet service, awareness, insufficient training, non-availability of OER in local languages and aligning with existing curriculum are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes.

The corresponding hypothesis three revealed that there is no significant difference between the mean responses of NOUN students in Anambra and Enugu State on the challenges facing NOUN in the utilization of OER for improving students' learning outcomes. This implies that inadequate internet service, insufficient computers, inadequate skills, infrastructure and lack of cultural relevance, technical support staff, awareness, training opportunities and aligning OER with the existing curriculum standard, non-availability of OER in local languages and learning objective are the challenges facing NOUN in the utilization of Open Educational Resources for improving students' learning outcomes in Anambra and Enugu State. There is an interesting contrast between the findings of this study and past studies. Zaid and Alabi (2021), stated that inadequate infrastructure and limited internet access in Nigeria are constrain to students' inconsistent access to online educational resources. Gambo and Sani (2017) and Olaiya and Umar (2023) highlighted that lack of awareness and understanding among educators and students about OER also hampers their uptake. Additionally, Zaid and Alabi (2021), Olaiya and Umar (2023), Idowu, Simisaye, and Okiki (2023) pointed out challenges including the absence of institutional policies and support systems, unclear guidelines and incentives for educators, difficulties in editing and localizing OER, and the lack of a sustainable funding model, which limit the scalability and long-term viability of OER in Nigerian universities. Furthermore, Olaiya and Umar (2023) noted that inadequate digital literacy skills and insufficient knowledge to assess the quality of OER are additional barriers hindering effective OER utilization among the students.

## **Conclusion**

The adoption and use of Open Educational Resources (OER) have emerged as promising strategies for enhancing learning outcomes and ensuring equitable access to education across various educational settings. This research investigated how the adoption of OER at NOUN impacts student engagement, academic performance, and overall learning experiences. The study showed that NOUN-OER Repository, MIT Open CourseWare, Coursera, TED-Ed, MERLOT, edX, British Library Digital Collections, OpenStax, Khan Academy, UNESCO-OER, National Science Digital Library (NSDL), Wikibooks, Future Learn, Open Learn, NASA Open Educational Resources, Wikimedia Commons, Project Gutenberg, Wikiversity, Codecademy and Smithsonian Learning Lab are highly available but lowly utilized in NOUN for improving students' learning outcomes in Anambra and Enugu State. Overall, this study provides valuable insights for policymakers and educators at NOUN to enhance educational outcomes in the study area. By embracing OER to facilitate fair access to quality education and cultivate inclusive learning environments, NOUN can continue leading the charge in transforming traditional educational models and empowering a diverse student body.

## Recommendations

Based on the findings of the study, the researchers recommended that NOUN should:

1. Create student-led advocacy groups to raise awareness about the benefits of utilizing OER during learning processes.
2. Implement quality assurance processes to ensure that OER materials selected for use, meet academic standards and are pedagogically sound.
3. Organize seminars, workshops, conferences and symposiums for students featuring presentations and panel discussions on OER utilization mechanism.
4. Forge partnerships with national, international OER organizations, and repositories to leverage existing resources and expertise on OER utilization.
5. Establish mechanisms for continuous evaluation and feedback from students regarding the use of OER, allowing for iterative improvements and adjustments over time.

## References

- Adamu, A.U. (2017). NOUN: Student population hits 400,000. National open university of Nigeria Blueprint. Doi: <https://www.blueprint.ng/noun-studentspopulation-hits-400000/>
- Ahmed, B. (2023). Determinants of lecturers' acceptance, use, and attitude towards open educational resources for knowledge sharing in universities in North-East, Nigeria. Being PhD dissertation, Department of educational technology, Federal university of technology, Minna.
- Akomolafe, C.O. & Olajire, A.A. (2014). Utilization of open educational resources (OER) and quality assurance in universities in Nigeria. *European Scientific Journal*, 10(7),535-543.
- Akpomi, M.E., & Nwamadi, C.C. (2020). Educational resources and the achievement of public junior secondary schools' goals in rivers east senatorial district. *International Journal of Innovative Social & Science Education Research*, 8(1),34-40.
- Ambrose, S.E., Akporhonor, B.A. & Eka, N.M. (2023). Attitudes towards the usage of open educational resources by postgraduate students at the National Open University of Nigeria (NOUN), south-south Nigeria. *Communicate: Journal of Library and Information Science*, 25(2),1-16. Retrieved on February 2, 2024 from <https://www.cjolis.org/>.
- Ayodele, J.B. & Ogiye, O.A. (2018). Resource availability and internal efficiency of secondary schools in Ekiti State, Nigeria. *International Journal of Educational Foundations and Management*, 12(1),204-208.
- Bornstein, M.H., Jager, J., & Putnick, D.L. (2013). Sampling in Developmental Science: Situations, Shortcomings, Solutions, and Standards. *Developmental Review*, 33 (4),357-370.
- Chamberlin, L., & Parish, T. (2011). MOOCs: Massive open online courses or massive and often obtuse courses? *eLearn Magazine*, 8 (1)13.
- Cheung, S., Wong, B. & Li, K. (2023). Perceived usefulness of open educational resources: Impact of switching to online learning for face-to-face and distance learners. *Frontiers in Psychology*, 13 1-9. <https://doi.org/10.3389/fpsyg.2022.1004459>.
- Commonwealth of Learning (2017). Open Educational Resources policy for higher education in Nigeria. Retrieved from <http://oasis.col.org/handle/11599/2798>
- Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika Journal*, 16 (3), 297–334. doi:10.1007/bf02310555.

- Ememe, P.I. & Modebelu, O.J. (2019). Challenges of accessibility and utilization of Open Education Resources (OERs) in single and dual mode Open Distance Education (ODE) Institutions in Lagos. *International Journal of Educational Research*, 6(1),114-126.
- Federal Government of Nigeria (FGN, 2017). *Nigerian Culture and Heritage*. Retrieved on February 2, 2024 from <http://www.nigeria.gov.ng/index.php/2016-04-06-08-38-30/nigerian-culture>
- Federal Republic of Nigeria (FRN, 2013). *National policy on education* (6th ed). Nigerian Educational Research and Development Council Publishers, Yaba, Lagos-Nigeria
- Gambo, R.D. & Sani, M.A. (2017). Use of open educational resources and print educational materials by Federal College of Education Katsina, Nigeria: A study. *DESIDOC Journal of Library & Information Technology*, 37(6),437. <https://doi.org/10.14429/djlit.37.10628>.
- Hilton, J. (2016). Open educational resources and college textbook choices: A review of research on efficacy and perceptions. *Educational Technology Research and Development*, 64(4), 573–590. <https://doi.org/10.1007/s11423-016-9434-9>
- Hodgkinson-Williams, C., & Arinto, P.B. (2017). *Adoption and impact of OER in the Global South*. Cape Town and Ottawa: African minds, international development research centre and research on open educational resources. DOI:10.5281/zenodo.1005330
- Huang, R., Tlili, A., Chang, T. W., Zhang, X., Nascimbeni, F., & Burgos, D. (2020). Disrupted classes, undisrupted learning during COVID-19 outbreak in China: application of open educational practices and resources. *Smart Learning Environments*, 7(2),1-15. <https://doi.org/10.1186/s40561-020-00125-8>
- Idowu, T.A., Simisaye, A.O. & Okiki, O.C. (2023). Institutional factors and use of open educational resources in Nigerian University Libraries. *Lokoja Journal of Information Science Research*, 1(1),126-146.
- Igbinovia, M.O., Obinyan O. & Okumode, V. (2022). Survey of Open Educational Resources among undergraduates in a State University in Nigeria. *Ghana Library Journal*, 27(1),1-133. DOI: <https://dx.doi.org/10.4314/glj.v27i1.1>.
- Inegbedion, J.O, & Opataye, J. (2018) OER 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.
- Islam, M.R. (2018). Sample Size and Its Role in Central Limit Theorem (CLT). *International Journal of Physics and Mathematics*, 1(1),37-47. DOI: <https://doi.org/10.31295/ijpm.v1n1.42>.
- Issa, A.I., Ibrahim, M.A., Onojah, A.O. & Onojah, A.A. (2020). Utilization of open educational resources for learning in universities in Kwara State. *The Online Journal of New Horizons in Education*, 10(3),192-200. Retrieved on February 2, 2024 from [www.tojned.net](http://www.tojned.net).
- Itasanmi, S.A. (2020). OER awareness and usage among open and distance learning students in South-Western Nigeria. *International Journal of Indonesian Education and Teaching (IJIET)*, 4(2), 343–357. <https://e-journal.usd.ac.id/index.php/IJIET/article/view/2643>.
- Johnny, A.E., Effiong, A.I., & Sheik, I. (2020). Entrepreneurship development centre in Nigeria’s tertiary institution and student’s self-employment upon graduation. *American Journal of Social and Humanitarian Research*, 1(4),1-13.
- Margulies, A. (2005). Types of Educational Resources: Open Course Ware Massachusetts Institute of Technology. Retrieved on February 13, 2024 from <http://www.unesco.org/iiep/virtualuniversity/forumsfiche.php>



- Muthanga, B.N., Ogalo, J.O., Were, S.M. & Maku, P.G. (2023) A Review on Utilization of OER in Teaching and Research in Academic Institutions. *Open Access Library Journal*, 10: e9926. <https://doi.org/10.4236/oalib.1109926>.
- Nardi, P.M. (2018). Doing survey research: A guide to quantitative methods. 4th Edition, Routledge, New York. <https://doi.org/10.4324/9781315172231>.
- National Open University of Nigeria (NOUN, 2016). Policy on Open Educational Resources. Lagos: NOUN. Retrieved on April 15, 2024 from <http://oer.nou.edu.ng>
- National Open University of Nigeria (NOUN, 2023). NOUN Profile 2022-2023. University Village, Jabi, Abuja. Retrieved on January 15, 2024 from [www.nou.edu.ng](http://www.nou.edu.ng).
- National Universities Commission (NUC, 2017). List of approved distance learning centres. Retrieved from <http://nuc.edu.ng/distance-learning-centers/>
- Nworgu, B.G. (2015). Educational Research Methodology. Nsukka. Hallman
- Obinyan, O.O., Okoroafor, C.K., & Ezenwuzor, L.N. (2023). Students' Awareness and Use of Open Educational Resources (OERS) in Selected Universities: Implication for Policy Studies. *International Journal of Research and Review*, 10(6),155-163. DOI: <https://doi.org/10.52403/ijrr.20230618>. Retrieved on January 25, 2024 from [www.ijrrjournal.com](http://www.ijrrjournal.com).
- OER Policy, (2017). *Open educational resources policy for higher education in Nigeria*. Commonwealth of Learning Burnaby, British Columbia.
- Ojo, S.A., Nwandu, L.O., Ogunjobi, O.P., & Edoaka, R. (2020). Assessing the Utilization of Open Educational Resources in Delivering TVET Programmes in Nigerian Universities. *Vocational and Technical Education Journal*, 2(1),139-146.
- Okon, J.E., Arop, F.O., Osim, R.O. & Ukpong, N.N. (2020). Principals' management of school material resources and secondary education goal attainment: A case study of secondary school managers in Akwa Ibom State, Nigeria. *The Journal of Social Sciences Research*, 6(9),856-864.
- Okwu, E., Ogunbodede, K.F. & Suleiman, A.B. (2023). Faculty Perceptions of the Use of Open Educational Resources in State Universities in Bayelsa and Rivers States Nigeria. *Asian Journal of Information Science & Technology*, 13(1),35-40. <https://doi.org/10.51983/ajist-2023.13.1.3485>.
- Olaiya, F.K. & Umar, Y.I. (2023). Assessing the awareness and perception of Open Educational Resources (OER) among Nigerian University students: A case study. *International Journal of Research in E-learning*, 9 (2),1-19. DOI 10.31261/IJREL.2023.9.2.07
- Olufunke, A.C. & Adegun, O.A. (2014). Utilization of open educational resources (OER) among undergraduates in universities in Nigeria. *European Scientific Journal*, 10(7), 535-543.
- Oluwayimika, K. & Idoghor, U. (2023). Awareness and Use of Open Educational Resources and its Benefits to University Students. *Innovare Journal of Education*, 11(3),32-35. <https://doi.org/10.22159/ijoe.2023v11i3.47718>.
- Onowugbeda, F. (2020). Needs Assessment of NOUN Students: Towards Improving Their NOUN Experience Report of the Makurdi Study Centre August 2020. *International Research Consortium*, Pp 3-4. DOI: 10.13140/RG.2.2.22578.32962.
- Taber, K.S. (2017). The use of Cronbach's Alpha when developing and reporting instrument in science education. *Journal of Research in Science Education*, 4(8),1273-1296. DOI:10.100/s11165-016-9602-2

- Taherdoost, H. (2016). Validity and reliability of the research instrument: How to test the validation of a questionnaire/survey in research. *International Journal of Academic Research in Management*, 5(3),28-36.
- UNESCO (2012). 2012 Paris OER Declaration. World OER Congress, Paris, June 2012. [http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/Paris%20OER%20Declaration\\_01.pdf](http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/Paris%20OER%20Declaration_01.pdf).
- UNESCO (2019) Recommendation for Open Educational Resources (OER). Retrieved on February 12, 2024 from <https://www.unesco.org/en/legal-affairs/recommendation-open-educational-resources-oer#item-0>
- Venegas-Muggli, J. I., & Westerman, W. (2019). Effectiveness of OER Use in First-Year Higher Education Students' Mathematical Course Performance: A Case Study. *International Review of Research in Open and Distributed Learning*, 20(2),210-218.
- Weller, M., de los Arcos, B., Farrow, R., Pitt, B., & McAndrew, P. (2015). The Impact of OER on Teaching and Learning Practice. *Open Praxis*, 7(4), 351–361. <https://doi.org/10.5944/openpraxis.7.4.227>
- Wiley, D. & Hilton, J.L. (2018). Defining OER-enabled pedagogy. *The International Review of Research in Open and Distributed Learning*, 19(4)17-29. <https://doi.org/10.19173/irrodl.v19i4.3601>.
- Wolfenden, F., Auckloo, P., Buckler, A., & Cullen, J. (2017). Teacher educators and OER in East Africa: Interrogating pedagogic change. In C. Hodgkinson.
- Yuan, M., & Recker, M. (2015). Not all rubrics are equal: A review of rubrics for evaluating the quality of open educational resources. *International Review of Research in Open and Distributed Learning*, 16(5),16-38. <https://doi.org/10.19173/irrodl.v16i5.2389>
- Zaid, Y., Alabi, A.O. (2020). Sustaining open educational resources (OER) in Nigerian universities. *The Journal of Open Distance and e- learning*, 36(2),181-197.
- Zaid, Y.A. & Alabi, A.O. (2021). Open Learning: Sustaining open educational resources (OER) initiatives in Nigerian universities. *The Journal of Open, Distance and e-Learning*, 36(2),181-197. <https://doi.org/10.1080/02680513.2020.1713738>.
- Zhang, X., Tlili, A., Nascimbeni, F., Burgos, D., Huang, R., Chang, T.W., Jemni, M., & Khribi, M.K. (2020). Accessibility within open educational resources and practices for disabled learners: A systematic literature review. *Smart Learning Environments*, 7(2),1–19. <https://doi.org/10.1186/s40561-019-0113-2>.
- Zimmermann, M., Mayweg-Paus, E., Ruwe, T. & Maine, F. (2023). Teacher evaluations of open educational resources designed to support dialogic cultural literacy learning in schools. *European Journal of Open, Distance and E-Learning*, 2(5),136–147. <https://doi.org/10.2478/eurodl-2023-0011>.