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COLLABORATIVE MODELS FOR OPEN EDUCATIONAL RESOURCES: ASSESSING EQUITY, COLLABORATION, AND SUSTAINABILITY AT NORTHWEST UNIVERSITY KANO STATE, NIGERIA

BY

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Abstract:

Purpose: *The study investigate collaborative models for the creation, and use of open educational resources (OER) at Northwest University, with a particular focus on collaboration, equity, and sustainability. Open educational resource has become essential for democratizing access to learning materials*

Design/ Methodology/ Approach: *The study used mixed method design to collect data from academic staff, ICT officers, librarians, administrative officers, and students through questionnaire, interview, and document analysis.*

Findings: *The study shows that the university promotes interdepartmental collaboration on open educational resources and that the resources are accessible by the students and other researchers, shortage of funds and insufficient funding and grant by the government is identified as some of the challenges affecting accessibility of open educational resources among academics.*

Recommendations; *the study recommends increasing awareness and training programs that will improve access and equal utilization of open educational resources. It also recommends that the government should create a sustainable funding or grant for academics staff that engaged in open educational creation and dissemination resources*

Implications: *the study would provide solutions to access open educational resources in Nigerian libraries and create awareness about the existence of such collection and the impact of collaboration for knowledge sharing and visibility and equity among users of information.*

Keywords: *Open Educational Resources (OER), Collaborative Models, Equity, Sustainability, Higher Education*

Paper type*: Empirical*

Introduction

Open Educational Resource (OER) have emerged as transformative tools, that provide access to quality teaching, and learning materials across the world (UNESCO, 2019). The adoption and development of OER are driven by the growing demand for affordable, accessible, and quality education, especially in low and middle-income countries like Nigeria where resource constraints challenge the conventional delivery of higher education. OER are “learning, teaching and research materials in any medium; digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others

with no or limited restrictions." (UNESCO, 2019). OER promote inclusivity, reduce educational cost, and enable collaborative knowledge creation.

In the Nigerian context, the need for sustainable and equitable access to learning materials is acute. Tertiary education institutions often suffer from underfunding, limited access to teaching materials, contributing to educational inequity and reduced learning outcomes (Jegede, 2012; Okonkwo & Ofoegbu, 2020). The integration of OER in Nigerian education system, remain uneven with limited institutional frameworks, policies that guide the OER development, adoption, and sustainability

Globally, universities, non-governmental organizations, governments, and technological companies have engaged in partnership to create, share, and maintain open resources; thus, collaboration lies at the heart of OER sustainability. The collaborative models often involve inter-institutional networks, faculty cooperation, public-private partnerships, and international consortia (Hylén, 2007; Coughlan & Perryman, 2015). Such collaborations allow institutions to pool expertise, share costs, and promote culturally relevant content creation and localization.

In sub-Saharan Africa, collaborative models have facilitated the sharing of academic practices and locally developed content that reflect the socio-cultural and linguistic context of learners. For example, initiatives like OER Africa and the African Virtual University have leveraged cross-border academic collaborations to build sustainable open content repositories OER Africa, (2011). However, in many Nigerian institutions, including those in the Northwest geopolitical zone, collaborative OER models are still emerging, patchy, or altogether absent (Adamu, 2022).

However, the Nigerian National Universities Commission (NUC) has acknowledged the role of OER in improving access to education, the national policy implementation has been slow and inconsistent. However, Northwest University, Kano, represents an ideal case study due to its position within a region characterized by educational marginalization, infrastructural challenges, and socio-cultural complexities. Focusing on this institution, the research can offer insights into the interplay of equity, collaboration, and sustainability in the context of OER development in Northern Nigeria. Even though the university shown interest in leveraging OER for teaching, learning, and research, however,

there is little empirical evidence on the models of collaboration among faculty, students, and other stakeholders; the extent of equity, and inclusiveness, and the strategies for ensuring long -term sustainability of OER initiative is missing.

In the context of OER, equity involves ensuring that learners, irrespective of gender, socio-economic status, geographical location, or disability, can access and benefit from open resources (UNESCO, 2020). However, access alone is not sufficient. Equity also includes the ability to participate meaningfully in content creation, localization, and knowledge sharing. Sustainability in OER refers to the long-term viability of open education projects, including their funding, governance, content updating, technological maintenance, and community engagement (Wiley, 2007). This research therefore, assess existing and potential collaborative models for OER at Northwest University; focusing on equity, and sustainability. The finding will guide institutional policy, and provide a model adoptable by other Nigerian Universities.

Statement of the Problem

Despite the global advocacies and recognition of the value and potentials of open educational resources in Nigerian universities have not fully adopted, realize the potentials. Universities in Northern Nigeria face persistent structural and contextual challenges; which include inadequate ICT infrastructure, limited funding, low faculty awareness or motivation, lack of institutional support, insufficient strategies for sustaining OER initiative, poor internet connectivity, and digital exclusion of marginalized groups such as women and students from rural backgrounds (Adamu, 2022; Okonkwo & Ofoegbu, 2020, Adebayo & Oyediran, 2021). These challenges are exacerbated by the absence of well-defined collaborative frameworks among stakeholders—universities, government bodies, non-governmental organizations, and the private sector—that are essential for developing sustainable and equitable OER practices.

Collaboration among lecturers, librarians, ICT specialists, and students is essential for creation, adoption, and dissemination of OERs. However, the extent and nature of such collaboration in Northwest university are unclear. The issue of equity and sustainability remains unexplored. This study aims to fill these gaps by examining OERs creation, sharing, and long-term institutional integration at Northwest university.

The main objective of the study is to: assess the collaborative models for open

educational resource (OER) at Northwest University, Kano, with emphasis on equity, collaborative dynamics, and sustainability.

The specific objectives are:

1. To identify the existing collaborative models used for the development and implementation of Open Educational Resources (OER) at Northwest University, Kano state.
2. To examine the equity of OER related activities.
3. To evaluate the sustainability strategies employed for OER initiative.
4. To propose a practical model for collaboration, equitable, and sustainable OER development in the university.

Ho1: There is no significant relationship between collaborative models of OER and equitable access to educational resources among users at Northwest University, kano

H_{02}: Collaborative models of OER implementation do not significantly influence the sustainability of OER initiatives at North-West University.

Literature Review

According to Sersekev, L and Sersemoon A. (2023) The objective of OER is to make education more accessible and affordable for all, by providing high-quality educational materials that are free to use and distribute. In higher education, OER has the potential to revolutionise the way in which students learn. By making educational materials freely available, students can access high-quality materials without the need to purchase expensive textbooks. This can help to reduce the cost of education and make it more accessible to all students. Additionally, OER can be customised and adapted to fit the specific needs of individual students and educators, which can improve the overall learning experience.

Abduldayan, A. H and Jibril A. F (2024) Open Educational Resources (OER) are freely accessible, openly licensed educational materials that can significantly enhance teaching and learning (Oladeji, 2023). As the cost of traditional textbooks continues to rise, educators, libraries, and institutions are increasingly turning to OER as a viable alternative (Oseni & Adigun, 2022). However, successful OER adoption requires strategic planning, collaboration, training and institutional support (Afolayan, 2021). Nigerian tertiary education faces several challenges, including the high cost of textbooks, which limits students' access to essential learning resources, and outdated materials that may not reflect current knowledge or diverse perspectives (Adeoye & Salami, 2022). Furthermore, there is often a lack of local

content that reflects Nigerian-specific needs and contexts in existing educational resources (Ekanem & Uzo, 2023). The integration of OER into Nigerian tertiary education remains uneven and fragmented. While some institutions have embraced OER, others lag due to barriers such as low awareness, limited capacity building, quality assurance issues, inadequate policy frameworks, and insufficient collaboration among stakeholders, libraries, faculty, and students (Femi & Adeola, 2022).

Recent studies, such as those by Johnson et al. (2023) and Mehta and Singh (2023), underscore the growing recognition of OER as a tool for educational equity. Johnson et al. (2023) explore the relationship between institutional support and faculty motivation in adopting OER, noting that the absence of structured incentives can hinder effective implementation. Mehta and Singh (2023) further examine how access to technological resources and ongoing technical support significantly influence educators' ability to integrate OER into their teaching practices

Theoretical Framework

This study is underpinned by three interrelated theories Social Constructivist Theory developed by Vygotsky, (1978), Equity Theory developed by Adams, 1963 and Sustainability Theory developed by Elkington, (1997). These theories collectively provide a multidimensional lens to examine how collaborative models of Open Educational Resources (OER) contribute to equitable access and long-term sustainability within the context of North-West University, Kano State, Nigeria.

Social Constructivist Theory Vygotsky, (1978)

Social constructivism emphasizes that knowledge is not passively absorbed but actively built through interaction, collaboration, and engagement with others. Learning, in this sense, is a socially mediated process that thrives in environments where people work together, share ideas, and build new understandings.

In the context of OER development and use at North-West University—a relatively new and evolving institution in a region with diverse socio-cultural dynamics—social constructivism justifies the need for collaborative partnerships among lecturers, students, librarians, administrators, and external stakeholders. These collaborations can help in co-creating relevant, context-specific, and culturally appropriate learning materials, which are essential for learner engagement and academic success in the North-West Nigerian setting. Furthermore, because educational resources in the region are often outdated

or inaccessible, a constructivist approach encourages a shift from passive consumption of content to active co-construction of knowledge via OER. This is particularly important in a region where education has faced setbacks due to infrastructural and socio-political challenges.

Equity Theory (Adams, 1963)

Equity Theory posits that individuals assess fairness in their access to resources, opportunities, and outcomes based on the inputs they bring into a system. When individuals perceive inequity—either in being disadvantaged or unfairly advantaged—they may become demotivated, disengaged, or less likely to participate.

In the North-West Nigerian educational landscape, educational inequities are deeply rooted due to socio-economic disparities, gender gaps, and digital divides. Many students face barriers such as poor internet access, limited digital literacy, and lack of personal devices—all of which restrict their ability to benefit from OER. Applying equity theory helps this study examine whether the current or emerging collaborative OER models at North-West University bridge or deepen these gaps. For instance, if OER platforms are designed without considering low-income students or those with limited connectivity, they may unintentionally widen educational inequality. The theory also enables the evaluation of faculty participation and motivation, especially in contributing to and adopting OER. Lecturers who feel that their input into OER development is not fairly recognized or rewarded may not remain active contributors, thereby affecting the system's growth and inclusiveness.

Sustainability Theory / Triple Bottom Line (Elkington, 1997)

Sustainability Theory, particularly as articulated through the Triple Bottom Line framework, emphasizes that sustainable practices must account for three interdependent dimensions: economic viability, social inclusion, and institutional/environmental endurance.

In many Nigerian universities, including North-West University, OER initiatives often lack continuity. They are typically dependent on donor funding, suffer from poor policy integration, and face weak institutional commitment. Sustainability Theory guides this study in assessing whether OER practices at the university are:

a. Economically sustainable (e.g., through internal budget allocations or cost-effective models),

b. Socially sustainable (e.g., by engaging marginalized groups and promoting long-term academic inclusion), and
c. Institutionally sustainable (e.g., by embedding OER into policy, training, curriculum design, and quality assurance systems).

Given the context of Kano State, a region where institutions often struggle with funding, political instability, and infrastructural limitations. This theory is particularly useful in analyzing how collaborative OER strategies can withstand such challenges and remain viable over time.

By combining these three theories, the study builds a comprehensive framework:

a. Social Constructivism highlights the importance of stakeholder collaboration in creating and using OER tailored to local needs.
b. Equity Theory ensures attention is paid to who benefits from these resources and whether the models in place are inclusive.
c. Sustainability Theory ensures that OER practices are evaluated not just for their immediate impact, but for their long-term viability within the socio-economic and institutional realities of North-West University and the broader Kano region

The sustainability theory, particularly through the Triple Bottom Line lens (economic, social, and institutional dimensions), informs the study's investigation into how OER initiatives can endure over time. Its implications include:

Policy Integration: The theory encourages assessment of whether OER is embedded in institutional frameworks such as academic policies, curriculum design, and faculty development plans. Without this, OER use may decline once external funding ends.

Resource Allocation: It raises questions about how the university finances its OER activities—whether budgets exist, whether cost-sharing models are applied, and whether there are financial incentives for content creators.

Community Ownership: Sustainability also depends on whether users and contributors feel a sense of ownership over OER platforms. If content creation and use are imposed rather than participatory, the likelihood of long-term engagement diminishes.

Scalability and Localization: In a region with socio-linguistic diversity and limited infrastructure, sustainable OER models must be scalable and adaptable to local languages, cultures, and learning contexts.

Thus, the sustainability lens compels the research to go beyond surface-level analysis and focus on the structural and strategic factors that influence OER survival and effectiveness in a challenging

context like North-West University, Kano State.

Methodology

This study adopts a mixed-methods research design, specifically a convergent parallel design, which involves collecting both quantitative and qualitative data simultaneously, analyzing them separately, and then merge the results. This design is appropriate for this study, because it allows for a comprehensive understanding of the collaborative models of OER, equity implications, and sustainability prospects at Northwest university, Kano state. The instrument for data collection was questionnaire, and structured interview. SPSS software was used to analyze the quantitative data, using frequencies, percentages, and mean. Inferential statistics was also used. The qualitative data was used using thematic analysis.

The population of the study is (416) which comprises of academic, and ICT staff, librarians, university administrators, and students at the Northwest university. Respondents. For the qualitative component, is ten (10) key policy implementers were selected for in-depth interviews.

A multi-stage sampling technique was employed; where **s**tratified sampling was used to categorize the population into relevant groups (academic staff, librarians, key university administrators and OER unit's coordinator, and students). Two hundred and one (201) respondents were drawn as sample based on the specifications by the Krejie and Morgan's Table for determining sample size from a given population.

Results

Data in this study was collected through questionnaire and presented in frequency counts, percentage and mean scores. The following Table presents the demographic information of the respondents.

Table 1: Demographic Information of the Respondents

Variable	Option	F	%
Gender:			
	Male	98	51
	Female	93	49
Age:			
	21-30	45	24
	31-40	57	30
	41-50	41	22
	Above 50	48	25
Role in the Library:			
	Lecturer	38	20
	Librarian	56	29
	ICT Staff	50	26
	Administrator	47	25
Educational Qualification:			
	Diploma	27	14
	HND	35	18
	Degree	24	13
	PGD	34	18
	Masters	42	22
	PhD.	29	15
Years of Experience:			
	Less than 1 year	42	22
	1–5 years	42	22
	6–10 years	48	25
	More than 10 years	59	31

Table 1 above presents the demographic information of the respondents. According to the Table, there is a fairly balanced gender distribution among respondents, with a slight (51%) male majority compared to (49%) of their counterparts. This indicates near gender parity in the study population. Coupled with this, the largest group of respondents are aged 31–40 years that constituted (30%), followed by those (25%) above 50 years of age. While (24%) of the respondents were aged 21-30, the least represented group is 41–50 years (22%). This suggests that the majority of the respondents are middle-aged, indicating a mix of early-career and experienced staff. However, the largest category (29%) of the respondents were Librarians. This was followed closely by ICT staff (26%) and administrators (25%) and Lecturers form the smallest group (20%). This shows the survey was dominated by professional and technical library staff.

Furthermore, the largest group (22%) of the respondents had a Masters degree. This

was closely followed by 18% who had HND, while, those with PGD constituted a sound (18%), those with PhDs were (15%). It is also observed from the table that a negligible percentage (14%) and (13%) had Diploma and Degree respectively. This indicates that a significant proportion of the respondents are well-educated, this may positively influence their contribution to library and digital services. Complement with this, the respondents that constituted (22%) were those with less than 1 year and 1–5 years, while the largest category are those with 10 years of experience (40%), the rest (25%) were those belonging to the category of 6–10 years of experience. This shows that a significant number of participants are seasoned professionals.

The demographic data shows a well-distributed mix of gender, age, professional roles, qualifications, and experience levels among the respondents. Majority of the respondents are professionals (with PGD, Master's, and PhD), and librarians are the dominant group. This diversity supports the reliability and representativeness of the study findings, especially in the context involving academic libraries and digital inclusion. The presence of both experienced staff and newer entrants ensures that perspectives reflect both traditional and emerging practices in the library setting.

Research Question One: What collaborative models are currently being used for the development and implementation of OER at Northwest University?

This research question was answered by the respondents and presented in following Table 2, where n=191.

Table 2: ***Collaborative models for the development and implementation of OER***

Statement	*SA* *F (%)*	*A* *F (%)*	*D* *F (%)*	*SD* *F (%)*	$\overline{X}$	*Decision*
The university promotes inter-departmental collaboration on OER development.	52 (27)	67 (35)	40 (21)	32 (17)	2.73	*Accepted*
Partnerships with other institutions for sharing OER materials.	45 (24)	69 (36)	51 (27)	26 (14)	2.70	*Accepted*
Lecturers, librarians, and ICT staff work together in producing OER.	65 (34)	55 (29)	35 (18.)	36 (19)	2.78	*Accepted*
Students are involved in the co-creation of OER content.	55 (29)	57 (30)	40 (21)	39 (20)	2.67	*Accepted*
There is an established OER committee or unit within the university.	61 (32)	62 (33)	32 (17)	36 (19)	2.77	*Accepted*
OER collaboration is supported by institutional policy.	75 (39)	49 (26)	31 (16)	36 (19)	2.85	*Accepted*
Workshops or trainings are conducted to support collaborative OER efforts.	52 (27)	57 (30)	38 (20)	44 (23)	2.61	*Accepted*

Table 2 presents collaborative models for OER at Northwest University. It is observed that a total of 52 respondents (27%) strongly agreed and 67 (35%) agreed that the university promotes inter-departmental collaboration on OER development, with a mean score of 2.73**.** This item was accepted, indicating that cross-departmental cooperation within the university is generally encouraged and recognized. Equally, 45(24%) respondents strongly agreed and 69(36%) agreed that there is partnerships with external institutions for sharing OER materials. The mean score of 2.70 led to an accepted decision, reflecting a positive perception of external networking and collaboration on OER initiatives. Similarly, collaboration among lecturers, librarians, and ICT staff was also rated positively. Sixty-five (34%) strongly agreed and 55 (29%) agreed with this statement. The mean score of 2.78 confirms the acceptance of this collaboration, suggesting that OER development is not limited to one category of staff. Coupled with this, Students are also involved in the co-creation of OER content received moderate support with 55 respondents (29%) strongly agreed and 57 (30%) agreed. However, 40 (21%) and 39 (20%) disagreed and strongly disagreed, respectively. Despite mixed views, the mean score of 2.67 still falls in the accepted range, indicating a modest but growing trend of involving students in OER production.

Furthermore, a significant number of respondents 61(40%) strongly agreed, 62(33%) agreed that OER committee exists within the university. With a mean score of 2.77, this item was accepted, suggesting that OER activities are institutionally coordinated through a dedicated structure. On the institutional policy support for OER collaboration, it was recorded that the highest level of agreement, 75 respondents (39%) strongly agreed and 49 (26%) agreed. The mean score of 2.85 also led to its acceptance, strongly indicating that institutional policies are in place to support collaborative OER initiatives. Workshops and trainings are also conducted to support collaborative OER efforts, where 52(27%), respondents strongly agreed and 57 (30%) agreed. However, 38 (20%) disagreed and 44 (23%) strongly disagreed, with a mean score of 2.61, this item was accepted, though relatively lower score suggests that training may not be consistently available or equally accessed by all.

The analysis reveals that collaborative models for OER development and implementation are actively present and functional at Northwest University**.** All the items examined received a mean score

above the acceptance threshold (2.50), confirming that respondents generally perceive strong institutional support, interdepartmental collaboration, staff integration, and growing student involvement in OER activities. Notably, policy frameworks and institutional structures are seen as key enablers.

Research Question Two: ***To what extent do these collaborative OER models promote equitable access to educational resources?***

This research question was answered by the respondents and presented in following Table 3, where n=191.

Table 3: ***Extent of collaborative OER models promote equitable access to educational resources***

Statement	*SA* *F (%)*	*S* *F (%)*	*D* *F (%)*	*SD* *F (%)*	$\overline{X}$	*Decision*
OER platforms are accessible to all students regardless of location.	57 (29.8)	64 (33.5)	36 (18.8)	34 (17.8)	2.75	*Accepted*
Gender does not influence access to OER resources in the university.	51 (26.7)	65 (34.0)	36 (18.8)	39 (20.4)	2.67	*Accepted*
Students with disabilities have equal access to OER materials.	55 (28.8)	63 (33.0)	31 (16.2)	42 (22.0)	2.69	*Accepted*
Internet access affects students' ability to use OER.	52 (27.2)	54 (28.3)	43 (22.5)	42 (22.0)	2.61	*Accepted*
The university provides support (e.g., devices, internet) for disadvantaged groups.	60 (31.4)	66 (34.6)	29 (15.2)	36 (18.8)	2.79	*Accepted*
Staff and students from all faculties benefit equally from OER initiatives.	65 (34.0)	54 (28.3)	34 (17.8)	38 (19.9)	2.76	*Accepted*
OER has helped bridge the gap between urban and rural students.	74 (38.7)	53 (27.7)	31 (16.2)	33 (17.3)	2.88	*Accepted*

This table presents the extent of collaborative OER models in promoting equitable access to educational resources at North-West University. On the statement that OER platforms are accessible to all students regardless of location. A total of 57 respondents (29.8%) strongly agreed and 64 (33.5%) agreed with this statement. Despite 36 (18.8%) and 34 (17.8%) showing disagreement, the mean score of 2.75 falls within the accepted range. This implies that a majority of respondents perceive that geographic location does not significantly limit students' access to OER platforms. In addition to this, 51 respondents (26.7%) strongly agreed and 65 (34.0%) agreed with the statement that gender does not influence access to OER resources in the university. However, a combined (38.2%) expressed disagreement. With a mean score of 2.67, this item is accepted, suggesting that while some disparities may exist, gender is generally not seen as a

major barrier to accessing OER in the university. More so, on students with disabilities have equal access to OER materials, 55 (28.8%) strongly agreed and 63 (33.0%) agreed, while 31 (16.2%) and 42 (22.0%) disagreed. The mean score of 2.69 results in an accepted decision, but the relatively high percentage of disagreement (38.2%) highlights a concern: although inclusion efforts exist, accessibility for students with disabilities may still need improvement.

Furthermore, regarding the statement that internet access affects students' ability to use OER. Here, 52 respondents (27.2%) strongly agreed and 54 (28.3%) agreed with the said statement. While a combined 44.5% disagreed or strongly disagreed. The mean score of 2.61 is accepted, confirming that internet availability is still a significant determinant of OER access and may unevenly affect students, particularly those in underserved areas. Similarly, on the statement that university support for disadvantaged groups (e.g., Devices, Internet), a large majority of respondents agreed: 60 (31.4%) strongly and 66 (34.6%) moderately, while only 29 (15.2%) and 36 (18.8%) disagreed. The mean score of 2.79 reflects an accepted decision. This suggests the university has initiatives in place to provide support for students who may face barriers in accessing educational resources. However, 65 respondents (34.0%) strongly agreed and 54 (28.3%) agreed the statement that staff and students from all faculties benefit equally from OER initiatives. With a mean of 2.76, this item is accepted, indicating a balanced distribution of OER opportunities across academic disciplines. Coupled with this, is the statement OER has helped bridge the urban-rural gap. This item recorded the highest mean score at 2.88, with 74 respondents (38.7%) strongly agreeing and 53 (27.7%) agreeing. This strong affirmation suggests that collaborative OER models are effectively reducing educational inequality between students from rural and urban backgrounds.

The analysis of Table 3 reveals that collaborative OER models at North-West University are perceived to significantly enhance equitable access to educational resources across diverse student groups. All statements were accepted, with mean scores above the threshold of 2.50, confirming a general agreement on the positive impact of OER initiatives. This was proven geographic and socio-economic equity is being addressed, particularly through access platforms and support services, faculty-wide distribution of OER is relatively fair and students with disabilities and those with poor internet

access still face some challenges, suggesting a need for more inclusive and infrastructural support and OER appears to be a powerful tool in bridging urban–rural educational divides, as indicated by the highest-rated item. These findings demonstrate that while equity in OER access is substantially supported**,** targeted strategies especially in terms of accessibility features and connectivity solutions can enhance inclusion for all Users.

Research Question Three: *sustainability of Open Educational Resources initiatives at the university?*

This research question was answered by the respondents and presented in following Table 4, where n=191

Table 4: Sustainability of the existing OER initiatives at the university

Statement	***SA*** ***F (%)***	***S*** ***F (%)***	***D*** ***F (%)***	***SD*** ***F (%)***	$\overline{X}$	***Decision***
The university allocates specific funding for OER development.	51 (26.7)	65 (34.0)	38 (19.9)	37 (19.4)	2.68	*Accepted*
OER is integrated into the university's academic and administrative policies.	64 (33.5)	53 (27.7)	35 (18.3)	39 (20.4)	2.74	*Accepted*
OER content is regularly updated and maintained.	53 (27.7)	58 (30.4)	38 (19.9)	42 (22.0)	2.64	*Accepted*
Staff are motivated (e.g., incentives, recognition) to contribute to OER.	60 (31.4)	65 (34.0)	25 (13.1)	41 (21.5)	2.75	*Accepted*
OER use and development is monitored and evaluated.	62 (32.5)	56 (29.3)	37 (19.4)	36 (18.8)	2.75	*Accepted*
External partners (e.g., NGOs, ministries) support the university's OER.	54 (28.3)	71 (37.2)	36 (18.8)	30 (15.7)	2.78	*Accepted*
There is a long-term vision or roadmap for OER implementation.	56 (29.3)	48 (25.1)	42 (22.0)	45 (23.6)	2.60	*Accepted*

Table 4 presents the sustainability of the existing OER initiatives at the University. According to the Table, the statement that the university allocates specific funding for OER development, 51 respondents (26.7%) strongly agreed and 65 (34.0%) agreed that the university allocates specific funding for OER. However, 38 (19.9%) and 37 (19.4%) disagreed. With a mean score of 2.68**,** this statement was accepted, showing that while some skepticism exists, there is general awareness of financial investment in OER activities at the university. Similarly, a total of 64 respondents (33.5%) strongly agreed and 53 (27.7%) agreed with the statement that OER has been integrated into the university's academic and administrative policies. With a mean of 2.74, the item is accepted, suggesting that OER has a recognized place within institutional structures, which is a strong indicator of

sustainability. Moreover, on the statement that OER content is regularly updated and maintained. This item received slightly lower support: 53 (27.7%) strongly agreed, 58 (30.4%) agreed, while 38 (19.9%) and 42 (22.0%) expressed disagreement. With a mean score of 2.64, this item is still accepted, indicating that content maintenance occurs, though perhaps not with uniform consistency or visibility.

However**,** 60 respondents (31.4%) strongly agreed and 65 (34.0%) agreed that staff are motivated through incentives or recognition. Despite 25 (13.1%) and 41 (21.5%) showing doubt, the mean score of 2.75 confirms acceptance of the said statement. This reflects that the university fosters a relatively positive environment for OER engagement through motivation strategies. In addition to this, the statement that OER use and development is monitored and evaluated has 62 respondents (32.5%) strongly agreeing and 56 (29.3%) agreeing, this item also had a good level of agreement. A mean of 2.75 indicates acceptance of the statement. Suggesting that monitoring mechanisms are in place to track OER implementation and outcomes, which contributes to sustainability. On the support for external partners, this item received broad support: 54 (28.3%) strongly agreed and 71 (37.2%) agreed, while a combined 34.5% disagreed. The mean score of 2.78 one of the highest signals indicating strong acceptance and reflects that external collaboration with NGOs, ministries, or other stakeholders plays a critical role in sustaining OER initiatives. Finally within this Table, the statement that here is a long-term vision or roadmap for OER implementation was supported by 56 respondents (29.3%) strongly agreed and 48 (25.1%) agreed, but 42 (22.0%) and 45 (23.6%) disagreed. Despite this, the mean score of 2.60 indicates acceptance of the statement. This suggests that while a long-term vision exists, awareness or clarity about it may not be evenly shared among staff.

The analysis of Table 4 demonstrates that the sustainability of OER initiatives at North-West University is positively perceived by staff across various domains. All seven items achieved mean scores above the 2.50 threshold, signifying overall acceptance of the statements and general agreement on the sustainability elements of the university's OER efforts.

Research Question Four: ***What strategic approaches can be proposed to strengthen collaboration, equity, and sustainability in OER?***

This research question was answered by the respondents and presented in following Table 5, where n=191.

Table 5: ***Strategic approaches proposed to strengthen collaboration, equity, and sustainability in OER***

Statement	*SA* *F (%)*	*S* *F (%)*	*D* *F (%)*	*SD* *F (%)*	$\overline{X}$	*Decision*
Increasing awareness and training programs will improve OER adoption.	54 (28.3)	58 (30.4)	43 (22.5)	36 (18.8)	2.68	Accepted
More inclusive policies are needed to ensure all users benefit from OER.	43 (22.5)	59 (30.9)	45 (23.6)	44 (23.0)	2.53	Accepted
Sustainable funding models are necessary to maintain OER initiatives.	62 (32.5)	52 (27.2)	42 (22.0)	35 (18.3)	2.74	Accepted
Collaborations with local and international organizations should be strengthened.	59 (30.9)	62 (32.5)	27 (14.1)	43 (22.5)	2.72	Accepted
Faculty involvement should be encouraged through incentives or recognition.	43 (22.5)	74 (38.7)	37 (19.4)	37 (19.4)	2.64	Accepted
User-led initiatives in OER should be supported.	57 (29.8)	67 (35.1)	31 (16.2)	36 (18.8)	2.76	Accepted
Local language content in OER can increase accessibility and inclusiveness.	57 (29.8)	63 (33.0)	35 (18.3)	36 (18.8)	2.74	Accepted

Table 5 above presents *strategic approaches proposed to strengthen collaboration, equity, and sustainability in OER. According to the Table,* a total of 54 respondents (28.3%) strongly agreed and 58 (30.4%) agreed with the statement that increasing awareness and training programs improves OER adoption. While 43 (22.5%) and 36 (18.8%) disagreed or strongly disagreed. The mean score of 2.68 indicated that the said statement was accepted by the respondents. Many respondents believe that awareness creation and capacity-building efforts are essential for promoting OER adoption. Coupled with this, on the statement that more inclusive policies are needed to ensure all users benefit from OER, 43 respondents (22.5%) strongly agreed and 59 (30.9%) agreed, while 45 (23.6%) and 44 (23.0%) disagreed with the said statement. Although views were mixed, the mean score of 2.53 is just above the acceptance threshold, leading to an accepted decision. This suggests recognition of the need for better inclusion, particularly for marginalized or underrepresented groups in OER practices.

However, 62 (32.5%) strongly agreed and 52 (27.2%) agreed with the statement that sustainable funding models are necessary to maintain OER initiatives. A mean score of 2.74 results in an accepted decision,

affirming that financial planning and sustainability are widely recognized as core to OER longevity. Moreover, the statement that collaborations with local and international organizations should be strengthened received strong support, where 59 respondents (30.9%) strongly agreed and 62 (32.5%) agreed. Although 27 (14.1%) disagreed and 43 (22.5%) strongly disagreed, the mean score of 2.72 confirms acceptance. The result shows that external partnerships are seen as strategic for scaling, sharing, and sustaining OER efforts. From the Table, it is observed that 43 respondents (22.5%) strongly agreed and 74 (38.7%) agreed, while 37 (19.4%) each disagreed or strongly disagreed with the statement that faculty involvement should be encouraged through incentives or recognition. A mean of 2.64 supports acceptance, highlighting that motivating faculty members through reward systems is considered a viable way to boost engagement in OER initiatives.

However, regarding the statement that user-led initiatives in OER should be supported. Here, 57 respondents (29.8%) strongly agreed and 67 (35.1%) agreed. Only 31 (16.2%) disagreed and 36 (18.8%) strongly disagreed with the said statement. With a mean score of 2.76, this statement was accepted by the respondents, indicating that empowering users to take ownership of OER projects is seen as an effective and sustainable strategy. Complement to this, 57 (29.8%) strong agreements and 63 (33.0%) agreements with the statement that local language content in OER can increase accessibility and inclusiveness. With a mean of 2.74, the item is accepted by the respondents. The result reflects a strong belief that integrating indigenous/local languages in OER content enhances reach, cultural relevance, and inclusion, especially for non-English speakers or rural users.

The findings from Table 5 indicate strong consensus among respondents that strategic actions must be taken to enhance the effectiveness, equity, and sustainability of OER at North-West University. It also reflects forward-thinking, inclusive, and action-oriented mindset among stakeholders, reinforcing that sustainable OER implementation depends on collective efforts, strategic planning, and equitable access for all user groups.

Hypothesis Testing

H_{01}: There is no significant relationship between collaborative models of OER development and equitable access to educational resources among users at North-West University, the second hypothesis

The following Tables present the Chi-square test result:

Table 6: Chi-square test result of relationship between collaborative models of OER development and equitable access to educational resources among users at North-West University

Variable	N	(χ^2)	(df)	P≤	P-value	Remarks
Collaborative models of OER development		49.759				
Equitable access to educational resources	191	50.115	16	0.05	.000	Statistically Significant

Table 6 above presents the χ^2 test collaborative models currently being used for the development and implementation of OER and equitable access to educational resources among users at North-West University**.** In both tests, the p-values (Asymp. Sig.) are 0.000, which are less than the conventional threshold of 0.05. Therefore, for both variables; collaborative models used in OER and extent of equitable access through OER models, the null hypothesis (that there is no association or effect) is rejected. Additionally, the note confirms that the assumptions of the χ^2 test were met; 0 cells have expected frequencies less than 5, which is ideal. The minimum expected cell frequency is 11.2, which indicates sufficient sample size for reliable χ^2 results.

The results show that the collaborative models currently used for OER

development and implementation at North-West University are statistically significant in their variation or impact, suggesting that these models are not random or incidental —they are structured and influential. There is also a statistically significant relationship between the use of collaborative OER models and the promotion of equitable access to educational resources. This means the way OER is collaboratively developed has a measurable effect on how fairly students can access educational content. Therefore, the inferential analysis provides strong statistical evidence that collaborative

approaches to OER development are actively implemented. These collaborative models positively influence equity in educational access at North-West University.

H_{02}: Collaborative models of OER implementation do not significantly influence the sustainability of OER initiatives at North-West University.

Table 7: Chi-square test result between collaborative models of OER implementation do not significantly influence the sustainability of OER initiatives at North-West University

Variable	N	(χ^2)	(df)	P≤	P-value	Remarks
Collaborative models used for OER development and implementation		49.759	16			
Sustainability of the existing OER initiatives	191	58.832	17	0.05	0.000	Significant Influence

Table 7 presents the χ^2 test between collaborative OER Models and Sustainability of OER Initiatives. Hence, ($\chi^2 = 49.759$, df = 16, $p < 0.05$) reveals a statistically significant association between the collaborative models used at the university and how they are being implemented. This means that the collaborative practices for OER development are not occurring by chance, but are likely systematic, structured, and impactful. Also, on the **s**ustainability of OER Initiatives ($\chi^2 = 58.832$, df = 17, $p < 0.05$). This also yields a statistically significant result, suggesting that the responses related to the sustainability of OER efforts vary in a meaningful way. It implies that perceptions or experiences of sustainability differ among groups, and these differences are statistically valid rather than random.

This analysis provides strong evidence that the **c**ollaborative models for OER development at North-West University are significantly associated with how OER initiatives are perceived and implemented. And the sustainability of these OER initiatives also varies meaningfully, likely reflecting different levels of access, awareness, institutional support, or policy clarity among stakeholders. Since both variables are statistically significant, it suggests that effective collaboration likely contributes to OER sustainability,

reinforcing the importance of structured teamwork, institutional support, and policy-driven frameworks in long-term OER success. It also confirms that the OER initiatives at North-West University are not just present, but are strategically implemented and meaningful in their outcomes. It further validates that collaboration plays a critical role in sustaining OER efforts.

Findings of the Research Questions

1. *The collaborative models currently being used for the development and implementation of OER at North-West University are* promotion of inter-departmental collaboration, partnerships with other institutions, collaborative production of OER by staff, student involvement in co-creation of OER, established OER committee or unit, OER collaboration is supported by formal institutional policy and workshops and trainings for OER collaboration.
2. *The extent of collaborative OER models promote equitable access to educational resources by* OER platforms are accessible through internet to all students and staff at all faculties regardless of location gender and disabilities which helped bridge the gap between urban and rural users
3. *The sustainability of the existing OER initiatives at the university are carried out through* funding allocation**,** policy integration**,** content updating**,** monitoring and staff motivation**,** external partnerships and long-term strategic planning.
4. *The strategic approaches proposed to strengthen collaboration, equity, and sustainability in OER are increase in* awareness and training programs, inclusive policies, sustainable funding models, collaborations with local and international organizations, faculty involvement, user-led initiatives and local language content.

Findings of the Research Hypotheses

1. There is significant relationship between collaborative models of OER development and equitable access to educational resources among users at North-West University.
2. Collaborative models of OER implementation do significantly influence the sustainability of OER initiatives at North-West University.

Discussion of Findings

The first finding of this study revealed that the collaborative models currently being used for the development and implementation of OER in North West University include inter-departmental collaboration, institutional partnerships, staff and student co-creation, a formal OER committee/unit, institutional policy support, and OER training/workshops. This finding is similar with that of Hodgkinson-Williams and Paskevicius (2012), which found out that OER development flourishes where structured collaboration exists—especially involving multiple stakeholders like faculty, librarians, and IT units. Additionally, Cox and Trotter (2017) found that in South African higher institutions, effective OER adoption was tied to the presence of OER champions, formal policies, and workshops for staff. However, in contrast, and in a study undertaken by Olcott (2012) noted that in many developing contexts, OER development remains fragmented due to a lack of institutional coordination, absence of policy support, and limited staff engagement. With regard to the interview, most of the respondents confirmed that,

> "the university utilizes internal inter-departmental collaborations, external institutional partnerships, formal OER committees, and student involvement in co-creating OER content.

The use of coordinated, policy-backed, and participatory collaborative models at North-West University aligns with best practices globally, placing it on a strategic path toward full OER integration. This collaborative foundation increases the likelihood of sustained OER adoption and implementation.

On the finding of this study thus; the extent of collaborative OER models in promoting equitable access to educational resources indicates that OER platforms at the university are inclusive, internet-accessible to all faculties and users, and help bridge urban-rural divides and accommodate users regardless of gender or disability. This finding is in line with that of Trotter and Cox (2016) who reported that OER initiatives in African institutions are particularly powerful in overcoming socio-economic and geographic disparities, as they remove cost and access barriers. Similarly, McGreal (2017) emphasized that OER, when combined with institutional commitment to equity, can drastically improve resource access for

marginalized learners. Contrary with this, Atenas and Havemann (2015) argue that mere availability of OER doesn't equate to access—especially where internet connectivity or digital literacy is lacking. However, respondents during the interview agreed that;

> "OER platforms have expanded access to educational resources, but digital inequality persists among rural, low-income, and disabled students."

North-West University's approach appears to go beyond provision, ensuring equitable *utilization* of OER. It's inclusive and collaborative OER infrastructure contributes meaningfully to digital equity, especially for rural and disadvantaged groups.

Furthermore, in the light of the findings that OER sustainability at North-West University is ensured through funding, integration into policy, content updating, performance monitoring, staff motivation, partnerships, and long-term planning.

OER sustainability at North-West University is ensured through funding, integration into policy, content updating, performance monitoring, staff motivation, partnerships, and long-term planning. This finding relates with the findings of Wiley (2007) who emphasized the "4 R's" of OER sustainability: Reuse, Revise, Remix, Redistribute—arguing that sustained reuse and support require institutional embedding. Similarly, Dhanarajan and Abeywardena (2013) highlighted the role of financial planning, policy integration, and continuous stakeholder training for long-term sustainability. Conversely, a study by Okonkwo and Ikegbunam (2020) in Nigerian universities reported poor sustainability due to ad-hoc funding, lack of strategic planning, and weak administrative support. According to the interview,

> "While the university has an OER policy and some support structures in place, sustainability is threatened by inconsistent funding, limited incentives, and irregular content updates."

North-West University's OER strategy reflects a shift from project-based efforts to a sustainable institutional model. This positions the university as a regional leader in OER sustainability and ensures continuity beyond individual champions or external funding cycles.

However, the last finding of the research questions which stated that the strategic approaches to strengthen collaboration, equity, and sustainability in OER in the

North West University include expanding awareness/training, inclusive policies, sustainable funding, local/international partnerships, faculty engagement, user-led efforts, and local language content development. This discovery is in comparison with that of UNESCO (2019) that advocates for inclusive OER policies, capacity building, and local content creation as part of the OER recommendation framework. Bliss and Smith (2017) suggest that localization (e.g., translating into local languages) and institutional ownership are critical for making OER contextually relevant and sustainable. Furthermore, research by Mulder (2015) demonstrates that community-led initiatives and strong internal awareness are drivers of OER success, particularly in resource-constrained settings. Though, during the interview sessions with the respondents in the North West,

> "University Participants recommended formal recognition for OER contributors, inclusive policies, targeted support for marginalized users, and stronger institutional partnerships to scale OER."

North-West University's proposed strategies are aligned with global best practices and policy recommendations. Their emphasis on inclusive and localized strategies reinforces the commitment to sustainable, equitable, and community-driven OER practices.

Findings of the Hypotheses:

The first hypothesis revealed that there is a significant relationship between collaborative models of OER development and equitable access to educational resources in the North West University. Similar findings of Cox and Trotter (2016) affirms that OER collaboration correlates with greater resource reach and democratization of knowledge. The effectiveness of such collaboration is contingent on supportive infrastructure and interdepartmental alignment. In addition to this, Butcher and Moore (2015) found that collaborative models in Kenyan and South African universities led to equitable access for underserved groups.

This hypothesis is supported by global and African literature. At North-West University, collaborative OER models are not only functional but are also facilitating wider, equitable access to learning materials, thereby advancing educational inclusivity.

The second hypothesis also revealed that collaborative models of OER implementation significantly influence the sustainability of OER initiatives. This finding relates with that of Wiley and Hilton (2018) who assert that sustainability hinges on institutional commitment and stakeholder collaboration. Initiatives that were not built on collaboration (especially across departments) tended to fade once external funding ended. Hilton (2016) noted that collaboration allows for shared ownership, reduced cost burden, and content longevity.

At North-West University, collaborative implementation appears to positively influence long-term sustainability of OER efforts. This is crucial in a Nigerian context where funding is often inconsistent —collaboration becomes a barrier for continuity.

The findings from North-West University echo strongly with both regional and international empirical evidence. The collaborative, inclusive, and sustainability-focused approach to OER development and implementation reflects a mature model, capable of enhancing educational equity and continuity.

Conclusion

This study examined the extent, nature, and outcomes of collaborative efforts surrounding OER within the institution, assess their implications for equity and sustainability, and propose evidence-based strategies to strengthen open education practices. The North West University currently employs a range of collaborative models including inter-departmental partnerships, external institutional collaborations, staff-student co-creation, and the establishment of formal OER units and policies. These practices align with global standards and foster a culture of shared responsibility in OER development. The North-West University is well-positioned for full-scale OER integration due to its strategic and inclusive collaboration frameworks.

The North West University's strategies which including increasing awareness, formulating inclusive policies, securing sustainable funding, and promoting local language content are well-aligned with international OER recommendations such as those from UNESCO. Interview participants reinforced these strategies, highlighting the importance of community-driven and locally relevant content. Therefore, by embracing globally recognized yet locally adaptable strategies, North-West University is reinforcing its commitment to equity, sustainability, and

inclusiveness in OER practices. Continued investment in faculty recognition, student involvement, and partnership building will amplify the impact of these strategies.

While collaborative models of OER development significantly improve equitable access. This is validated by both empirical literature and field data, indicating that coordinated collaboration promotes democratization of knowledge. North-West University demonstrates this through inclusive content development and expanded access. The c*ollaborative models of OER implementation significantly influence sustainability. Here, the* university's experience affirms that institutional collaboration is key to sustaining OER. Inconsistent funding and staff motivation issues are mitigated when collaboration ensures shared responsibility and continuity beyond individual champions.

The case of North-West University demonstrates that OER development, when backed by structured collaboration, inclusive access models, and a sustainability-focused strategy, can meaningfully transform higher education delivery. However, the university must continue to close equity gaps**,** institutionalize support**,** and localize content to sustain and scale its OER impact effectively.

Recommendation

The following recommendations were offered based on the findings of the study:

1. The Kano State Ministry of Higher Education & North-West University Management
   should develop and enforce comprehensive OER policies that promote inclusive collaboration, equitable access, and sustainability. These policies should mandate inter-departmental participation, regular training for staff and students, and recognition for OER contributors. This will ensure continued growth and integration of OER into the university system.
2. Kano State Government & North-West University Management should create a sustainable funding stream and introduce incentives (e.g., grants,

academic recognition, and workload reduction) for faculty and staff engaged in OER creation and dissemination. This will reduce reliance on external donors and promote local ownership of OER initiatives.

3. Kano State Government & Ministry of Higher Education should invest in digital infrastructure such as campus-wide high-speed internet, provision of learning devices, and digital literacy programs, especially for students from rural, low-income, or disabled backgrounds. This will aimed at bridging the digital divide as a key to maximizing the equity potential of OER in higher education.
4. The State Ministry of Higher Education & North-West University Management in Kano State should promote partnerships with other universities, NGOs, and international organizations to share resources, exchange best practices, and co-develop localized OER content, including in Hausa and other local languages. This will help scale up OER reach, build institutional capacity, and ensure cultural relevance.

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