



## INNOVATIVE WAYS TO DESIGN OPEN EDUCATION RESOURCES FOR MARGINALIZED COMMUNITIES

Otubelu Blessing Nnenna (PhD) (CLN); Anike Angela Njideka (PhD) (CLN) & Uju Agatha Nnatu

[nb.otubelu@unizik.edu.ng](mailto:nb.otubelu@unizik.edu.ng);

[an.anike@unzik.edu.ng](mailto:an.anike@unzik.edu.ng); &

[an.nnatu@unizik.edu.ng](mailto:an.nnatu@unizik.edu.ng)

Prof. Festus Aghagbo Nwako Library, Nnamdi Azikiwe University Awka  
Anambra state Nigeria

### ABSTRACT

*Internal security challenges in African countries have resulted in large numbers of displaced persons. In 2022 the National Bureau of Statistics (NBS) reported that there are 2 million persons internally displaced in Nigeria. Educating these marginalized groups requires meticulous planning and strategy. These marginalized groups need to be included in the educational landscape; Open Education Resources (OER) offer a promising avenue to bridge the educational gap. This paper looks at novel approaches to the design of OER that meet the distinctive needs and challenges faced by these communities. By understanding the characteristics of marginalized groups and their educational struggles, educators and designers can create OERs that are not only accessible but also culturally relevant, interactive, and adaptable. This study delves into strategies such as collaborative content creation, multilingual localization, mobile access solutions, gamified learning, and community empowerment. It emphasizes the importance of incorporating local context, engaging community members, and addressing infrastructure barriers. Furthermore, the study highlights the role of partnerships with the National Open University of Nigeria (NOUN) to share OER initiatives. Through the findings of this case studies, this study showcases successful projects that exemplify these innovative design approaches, fostering a deeper understanding of how OER can become a transformative force in empowering marginalized communities in all 6 geopolitical zones of Nigeria through education though the communities needed governmental support in infrastructural provisions. This is important because it empowered these communities not to abandon education despite their challenges. Finally, the study give room to research on quality of education delivery through OER.*

**Keywords:** Open education resources, Marginalized Communities

### Introduction

The process of information dissemination over the Internet without infringing on copyright law has been a great concern to educationists and other relevant stakeholders. It is without any ambiguity that the steady growth in internet connectivity has opened a bigger frontier in access and transfer of knowledge (Lee 2020). The opportunities presented by this digital revolution have made it possible for the information to reach people in unconventional places such as hospitals, internally

displaced camps (IDPs), prisons, and so on mainstreaming what can be referred to as informal learning. This informal way of learning has evolved over the past decades and can simply be referred to as impromptu learning that can take place anywhere and anytime away from formal classroom settings and regimented curriculum (Tlili et al. 2020).

The concept of open education resources (OER) was first coined at the 2002 United Nations



Educational, Scientific and Cultural Organisation (UNESCO) forum and finally declared at the 2012 Paris Convention under her Education for All mission. The conference commenced with the dictum "Everyone has the right to education", referring to the Universal Declaration of Human Rights charter. The motive behind this was to encourage developed countries to support less endowed countries to have access to quality education resources which will help in UNESCO education for all goals. This position was further ratified in the 2019 UNESCO conference by all the state representatives by coming up with stronger objectives which include: 1) building the capacity of patrons to create, access, adapt, use and redistribute OER; 2) formation of supportive policy to allow the adaption and use of OER; 3) the development of valuable, inclusive and reasonable access OER; 4) backing and encouraging the creation of sustainability model of OER and 5) supporting international cooperation on OER.

Educating these marginalized groups requires more than conventional approaches; it demands meticulous planning and innovative strategies that can adapt to the distinctive needs and challenges they face. According to (Sevelius, Jae, Gutierrez-Mock, Zamudio-Haas, McCree, Ngo, Akira and Clynes (2020) marginalized communities can be defined as those excluded from mainstream social, economic, education and cultural life as result of their prevailing conditions. The prevailing conditions may be natural or manmade. Open Education Resources (OER) have emerged as a beacon of hope, offering a promising avenue to bridge the educational gap in these troubled regions. OER, with its accessibility and adaptability, has the potential to transform the educational landscape for displaced persons and individuals living with disabilities. The nature of academic work requires sharing knowledge and

building upon the ideas and experiences of others (Gilchrist and Fitzgerald 2018).

This paper embarks on a journey to explore novel approaches in designing OERs that are tailor-made to address the specific needs of marginalized communities. It delves into the innovative design to share OER, encompassing collaborative content creation, mobile access solutions, gamified learning, etc. In doing so, this study seeks to understand the characteristics of marginalized groups, their educational struggles, and how educators and designers can leverage OER to not only make education accessible but also culturally relevant, interactive, and adaptable.

## Literature Review

Many researchers had previously worked on the importance of OER in education. Kimmons (Kimmons (2021) discovered that OER provides equal opportunity to all people regardless of their location as far as they have the enabling factors to have unfettered access to information. The three most enabling factors to accessing open resources materials according to the findings of the research include Smart devices, high-speed internet presence, and constant power. Their study faulted the training given to teachers in Kuwait that is without OER contents. The dissatisfaction forced 91% of the teachers to pay their way to get training with OER content abandoning the free training offered to them by the government. Though most OER content is not in Arabic language the teachers took the pain of translating the content to Arabic language. The study further showed that the content of OER is mostly used is YouTube in Kuwait. However, this study did not show the correlation between the correct content and the mode of delivery.

According to (Alberola-Mulet, Iglesias-Martínez, and Lozano-Cabezas (2021) teachers' integration



of OER in carrying out their assignment has contributed significantly to the quality of education delivery. The research advocated that teachers must be comfortable with the use of various forms of OER to enrich the content of their education delivery. Necessary policies should be enshrined continually by such international bodies as UNESCO to ensure that developed economies make funds available for OER to be open and available for all teachers. Institutional support is one of the main barriers that teachers face when they use OER (Ozdemir and Bonk 2017). Such hindrance can be overcome by ensuring that OER becomes a substantial part of teachers' lesson plans especially as it relates to learners' motivation and engagement in learning. The summary of the study by (Sandanayake 2019) showed that teachers need to be innovative to effectively use OER. Innovative use of OER will lead to a paradigm shift from content-based instruction to context-based instruction. The context-based instruction is more practical and lends itself easily to the understanding of learners. It is a fact that if teachers use OER in informal settings, it could enrich the quality of teaching and learning and more importantly bring about refined skills (Zainal and Mohd Matore 2021).

There is a common understanding of OER's potential for access to increasing innovations in education. This is so because OER has premium placement over other innovations in education (Tlili et al. 2019). OER came with five main principles for usage which concede the user the following important privileges: download, duplicate, reuse, revise, and remix. The right to download enables the user to store the resources on his/her local machine. This helps the user to refer to the resources with or without the availability of the internet once it is downloaded from the internet. The duplicate right allows the user the privilege to share the resources, especially

from teacher to student. The power to use the content in other format other than making a profit is granted by the reuse privilege. The content can be used again on the website with proper referencing. The revised principle enables the user to boost the quality of the content by the addition of other useful material. Finally, the remix principle allows the user to add or merge other resources with it (Fazzino and Turley 2019).

Notwithstanding the overbearing potentials of OER (McGreal, Kinuthia, and Marshall 2013) noted five barriers to the effective use of OER including firstly lack of technological tools to access OER; secondly minimal or non-institutional backing; thirdly lack of adequate skills and time for users; fourthly quality of OER and fifthly users' moral inclination. The issue of protection of individual knowledge through the mechanism of intellectual property and copyright as enshrined by the charter is a major concern to the remix principle of OER. It is estimated that most of the educational material on the internet is protected by traditional copyright terms and conditions of use which contradicts the openness of OER (Carey et al. 2015).

### **Marginalized Communities**

The term marginalized communities are a common denominator used to describe persons in a condition not conducive enough for receiving conventional education. The people that fall under the category of this group are people internally displaced from their homes due to internal conflict and natural disasters like floods, landslides, etc. others are persons serving their prison terms, persons confined to a particular location by disability, such as the cripple, spinal cord injury victims, and so on. Most of the internally displaced persons are as a result of protracted violence between herders and farmers. Most of the persons have been displaced from their native



settlement since 2015 till date (Sevelius, Jae M., Luis Gutierrez-Mock, Sophia Zamudio-Haas, Breonna McCree, Azize Ngo, Akira Jackson and Carla Clynes 2020). The first thing displacement does to individual is the change of his/her comfort environment. People who are displaced typically do not find it easy to carry out their daily tasks, such as attending school. Internally displaced camps are usually constructed in areas with available space, but they typically lack the amenities that are needed. In a bid for them to

have access to education, government provides technology infrastructure to support that and provides devices by her agencies such as Universal basic education board commission (UBEC), Tertiary Education Fund, National Information Technology Development Agency (NITDA) and so on. Due to climate change, the flood is a yearly threat to those who live in the region of River Niger and Benue because in 2022 676, 000 hectares of land were affected by flood water.

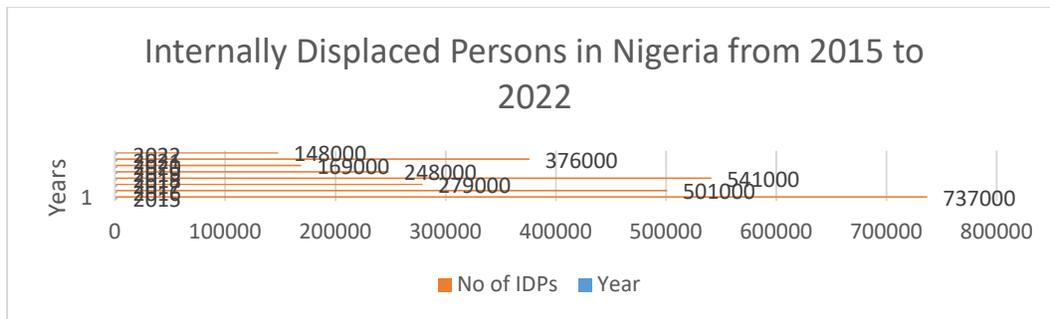


Figure 1: IDPs in Nigeria.

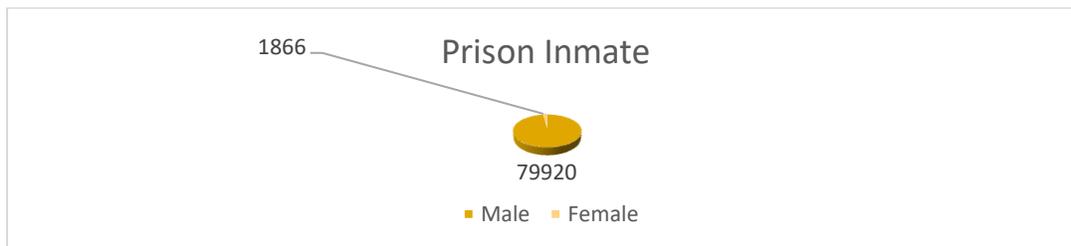


Figure 2: Prison Inmate in Nigeria

The data from Nigeria correctional centers showed that there are 81, 786 inmates in the 240 correctional centres across Nigeria as can be seen in Figure 2. Education must be designed to capture the interest of this group going by National policy in education which the policy objectives include: contributing to high national development manpower training; providing an accessible quality learning opportunity for all citizenry;

providing high-quality counseling and lifelong learning programme that prepares students for self-reliance and the world of work; reduce shortages skill manpower through concerted production of such manpower relevant to labour market; promote and encourage scholarship and to forge and cement national unity (Chijioke and Tambari 2018). The rationale for focusing on these communities (prison inmates, disabled group and



displaced persons) is because they are the perceived disadvantaged groups as it concerns education for all pursuit of the government. With enabling infrastructure, this approach can be tried on other communities such as adult education for market women, education for the herders, and so on.

### Research Method

This study adopted a systematic review of the activities of the National Open University of Nigeria (NOUN). Therefore the study foundational data was from NOUN's teaching engagement with the marginalized community using OER concept.

### Ethical considerations

As the research policy stipulates in NOUN, the conduct of any research must be ethically certified hence the researcher relied on approval granted earlier (Noun, 2002).

### Case Study: Mobilizing OER through the instrumentality of National Open University Nigeria

The case study reported in this research is how the National Open University of Nigeria is using the instrumentality of OER concept to distribute their courseware to all communities including the marginalized community no matter the location.

Course Code	Course Title	Credit Unit	Level	Semester	Host Faculty
PHY 302	Modern Physics II	2		2	Education
LIS 103	Introduction To Library And Information Work	2	100		Education
LIS 108	History Of Writing, Publishing And Book Trade	2	100		Education
KHE125	Adapted Physical Education	2	100	1	Education
LIS109	Introduction to African Information Environment	2	100	1	Education
LIS107	Basic Computer Skills & Operating Systems	2	100	1	Education
LIS105	Information Systems, Resources & Services	2	100	1	Education
LIS103	Introduction To Library And Information Work	2	100	1	Education
LIS101	Information Literacy	2	100	1	Education
KHE107	Skills Development And Techniques In Sports And Games 1 Track And Field Events (Middle And Distance Races) Table Tennis.	2	100	1	Education

Figure 3: NOUN Courseware Screen

NOUN was established by the parliamentary Act No.6 of 1983 which was later signed into law by then President Shehu Shagari of blessed memory. The law establishing NOUN was suspended by the military coup that took over the then-civilian government. The return of steady civil rule in Nigeria in 1999 made the then-President Olusegun Obasanjo resuscitate the NOUN Act in 2002. This was done to bridge the gap created by insufficient conventional physical Universities put side by side with the teaming population (Ajegbomogun, Okunlaya, and Alawiye 2017). There was also background yearning for convenient further studies by workers in the lower cadre who needed

on without abandoning their jobs to move to the climax of their careers. NOUN was established with the vision of being seen as the foremost University providing highly accessible and qualitative education for all (Agbu et al. 2016). At present NOUN has 78 study centres across. The study centers are provided for administrative convenience for students. The study centers also serve as centers where students pick up their materials and where they interact with their lecturers. Figure 2 shows the enrolment of some of the study centers. The Figure reveals that the Lagos study center has the highest number of enrolments because of the commercial nature of the state.

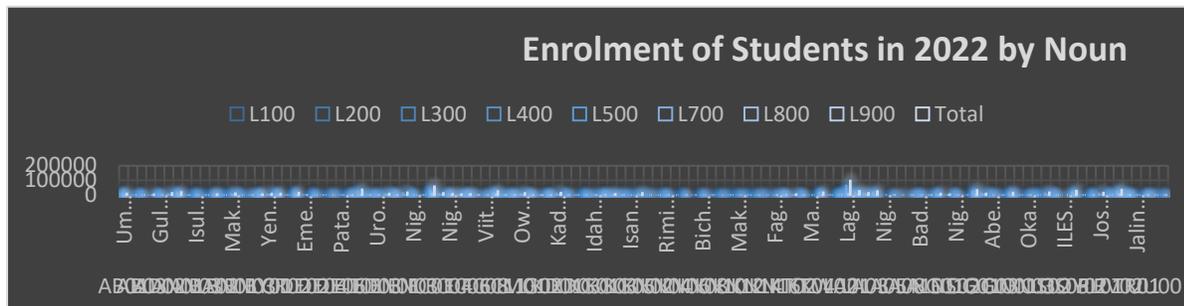


Figure 4: 2022 NOUN Student Enrolments by Centre

Concerning knowledge mobilization of academic content, the teaching method adopted in NOUN is the use of audio, video, CD-ROMS, television, and other useful multimedia channels. The Creative Commons license grants the public permission to use their teaching materials free of charge. NOUN has the liberty to share its courseware with every person to use whether you are affiliated with them or not [18]. Institutions and/or individual lectures have the unhindered access to adapt NOUN material for their teaching and learning. The other interesting thing about NOUN materials is that people dislodged by

conflicts or other natural disasters can continue their education in their new location. The NOUN materials which can be in the form of audio, video, texts, and so on as shown in Figure 3 are put in courseware format that users can download on the internet and use. The user can adapt the material to suit his/her needs without necessarily infringing on anybody's rights. To ensure that the material is authentic and up to standard, they are subjected to vigorous professional tests and checked before satisfied fit for use. The production of such material is by a team headed by a lecturer not lower than the rank of senior lecturer.

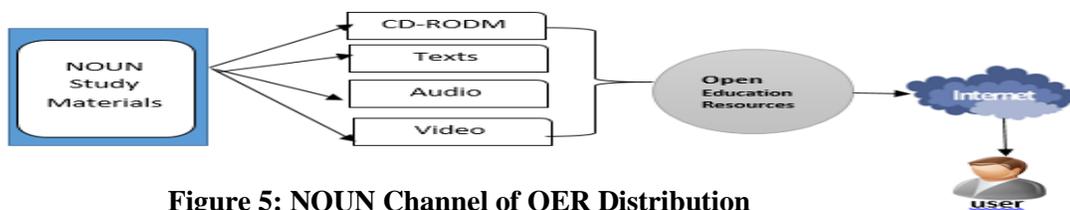


Figure 5: NOUN Channel of OER Distribution

Observation from the case study showed due to poor skill uptake, the innovative way of presenting OER in terms of gamification and artificial intelligence is not in place in NOUN currently. There is a standard format for preparing

courseware in NOUN creator must follow. The format allows for easy access, therefore authors preparing the resources must ensure that follow the metadata as contained in Table 1.



**Table 1: Courseware Format in NOUN**

Field	Necessary	Descriptions
<b>Title</b>	Yes	Give your resources a fitting title
<b>Author(s)</b>	Yes	Supply the author(s)/ Creator(s) of the resources
<b>Abstract</b>	Yes	Summarize the content as much as possible
<b>Body of the Content</b>	Yes	Supply the details of the content
<b>Bibliography</b>	Yes	Acknowledge all materials used in the text
<b>Faculty</b>	Yes	Select the academic faculty that the material is created for
<b>Department</b>	Yes	Select the academic department that the material cohesively represents
<b>Media Type</b>	Yes	Select the item that best describes your resources. This can be video, audio, text, etc.
<b>Language</b>	Yes	Select the appropriate language that you created the resources with
<b>Level</b>	Yes	Select the level of student the resources are meant

### Innovative OER Strategies for Marginalized Communities as used by Case Study (NOUN)

The innovative strategies are various ways NOUN employed to deploy OER to the marginalized community of the case study. There are already established learning methods tested.

#### ✚ Collaborative Learning

Students learn more when they are active participants in the entire process when in online learning or face-to-face settings. In a collaborative learning scenario, the individual is responsible for his/her actions including learning, and is expected to respect the capabilities and contributions of his/her peers (Chatterjee and Correia 2020).

In a completely online learning ecosystem, collaborative tools such as Wikis, Google Docs, and interactive boards are employed by instructors to facilitate learning by peers. Nonetheless, these could be used to support cooperative learning rather than collaborative learning (Ishtaiwa and Aburezeq 2015). The way participants use this interactive learning will tell whether collaborative learning is actualized. In a marginalized community setting where there is not much space, learners can be organized in clusters while assessing the education material. Assignments and projects can be given to each

group ensuring all the members of the group actively participate. NOUN can indeed utilize the opportunity offered by collaborative learning tools to help the learning process of their students under marginalized groups.

#### ✚ Gamified Learning

The use of digital games in learning is the term referred to as gamified learning. It is a strategy to increase learners' engagement. Advancement in mobile technology is the major reason for using games to intervene in important as education. The important feature of games is that they have the potential to grab learners' attention. According to (Caponetto, Earp, and Ott, n.d.) gamification is used to describe the process of using gaming methods and techniques in the non-gaming environment for motivation.

When the concept of gamification is applied in education, the prospect of self-paced, experiential, and lifelong learning increases exponentially. Learners are obsessed with fun and then rewarded with knowledge and skill (Caponetto, Earp, and Ott, n.d.). The logical impact of gamified learning is in the context of online course delivery and learning. Since the teacher is not physically present, the game will capture the attention of the learner throughout the length of the lecture (Smiderle et al. 2020). As



educators continue to explore better ways of engaging a wider audience of learners in a broader context of the environment, the application of games in learning will offer more catalyzing tools to achieve this.

### Advantages of Gamified Learning

- i) It captures the learner's attention.
- ii) It enhances motivation and engagement in learning.
- iii) It supports learning at the learner's pace.
- iv) It increases learners' retention
- v) It creates fun in learning

### Disadvantages Gamified Learning

- i) It is expensive to implement as it requires a higher bandwidth of internet.
- ii) It appears funny to adult learners.
- iii) It needs a stronger device.



### Mobile Access Solution Learning (MASL)

Mobile Access Solution Learning (MASL) is simply using mobile technologies to facilitate learning. It is eLearning accomplished by mobile technologies and mobile learning platforms (Hwang et al. 2011). The fact is that if any educator tends to reach the marginalized group, they must look in the way smartphones and other ultra-portable devices because they are daily gaining enough critical mass to be considered mainstream in the lives of these marginalized groups. An important feature of this learning is that the learning can always take place at any no fixed location. It can be moved from one location to another location that supports it (Criollo-C et al. 2021). The problem of low internet connection associated with accessing OER is taken care of by the fact that in MASL the learning environment is not fixed. The learner is at liberty to use any environment that supports his/her device. But for those that are confined like those in prison, the government must ensure that

necessary infrastructure is put in place at the location.

The advancement in mobile and wireless technologies environment has promoted socialization among any group of people and education must take that advantage. The number of accounts on social media applications such as Facebook, X (formerly known as Twitter), Instagram, TikTok, etc continues to grow in geometric progression. People spend their time and money doing things that will not add value to their lives. Education providers such as NOUN should leverage the favourable characteristics of mobile technologies such as flexibility, ubiquity, and portability to reach their learners irrespective of their location (Brantes Ferreira et al. 2013).

### Advantages of MASL

- i.) It is portable to administer.
- ii.) It is flexible in the context of location.
- iii.) It is self-directed.
- iv.) It is cheap to operate considering other digital-driven learning.
- v.) It allows the citizenry to improve the way they acquire knowledge.
- vi.) It facilitates experiential learning.
- vii.) It encourages active participation.
- viii.) It has a service-oriented architecture.

### Disadvantages of MASL

- i) From the pedagogical perspective, it is difficult to decide what should be learned inside the classroom and what to learn outside the classroom.
- ii) There are bound to be distractions because of other mobile apps such as social media apps.
- iii) It puts the pressure to succeed solely on the learner.
- iv) Culture of rejection by the community.



## Discussion of the findings

The findings of this research showed that the use of games, mobile access solution and collaborative learning had in no small way improved the delivery of OER to a community of learners that hitherto has some level of bias in its adoption. This corroborated with study done Witthaus (2023) which stipulates that introduction of additional model will enhance and provide additional understanding to online displaced learners.

From the findings of Mncube, (2023) OER content can serve as ordinary open electronic resources if they are not created and initiated by some creative common. Therefore the game approach was observed from the study not comply with this principle.

## Conclusion and Recommendations

The research findings presented in this study underscore the transformative potential of technologically enriched learning environments in conjunction with uninterrupted access to essential infrastructure, particularly a stable power supply. Specifically, the outcome of the finding showed that OER and technologies can make it possible for a student to continue his/her education without interruption regardless of the natural disaster. Such an educational setting empowers educators to deploy innovative pedagogical methods, thereby fostering the acquisition of critical technological competencies among students. Notably, the National Open University of Nigeria (NOUN) stands out as a pioneering institution in the realm of remote learning within the Nigerian context, extending its educational resources to learners irrespective of their geographic location.

Nevertheless, it is imperative to acknowledge that marginalized communities in Nigeria face notable challenges due to the paucity of requisite technological and infrastructural provisions for the

effective assessment and utilization of Open Educational Resources (OER). These inadequacies significantly impede the holistic progress of educational development within these underserved populations, raising pertinent concerns about equitable access and educational inclusivity within the broader landscape of Nigerian education.

## Recommendations

The following recommendations will assist decision-makers in ensuring OER is utilized more innovatively by marginalized communities:

- The government should provide basic infrastructures such as steady power and good internet in the environs of the marginalized communities.
- Policymakers should provide more devices for accessing OER by marginalized groups.
- Policymakers should clarify and define the licensing scheme of OER to avoid abuse.
- Nigerian education policy makers ought to make sure that teachers receive a combination of context-based and content-based training, rather than solely content-based instruction.

## Limitations of the study and directions for future research

The spread of IDP camps made impossible for the researcher to physically collect primary data from the community members but depend on the secondary data. There is always room for better interpretation of data. Another possibility is to investigate this innovation on another community to look into the quality of education delivered through OER whether there are of the same standard with one-on-one type of education. This is important because standard should not be sacrificed on the altar of any innovative mode of delivery.



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