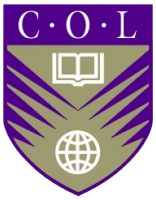


# West African Journal of Open and Flexible Learning

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# WEST AFRICAN JOURNAL OF OPEN AND FLEXIBLE LEARNING

**Aims and Scope**

The West African Journal of Open and Flexible Learning exists to facilitate and encourage high-quality scholarship on important theoretical and empirical work in Open and Distance Learning (ODL), research as well as research in all disciplines that could be taught and learnt through the open and distance learning approach. Researches in the Sciences and Social Sciences, Humanities, Law, etc. are therefore equally encouraged especially those whose findings have identifiable implications for open and distance learning. ODL is a rapidly developing discipline which encourages teachers and learners of all disciplines to think of alternative modes of content delivery; alternative to the conventional face-to-face method, particularly for purposes of expanding access to the discipline. Hence, there is a need for all disciplines to research the best ways of applying the ODL philosophy.




**WAJOFEL** is published twice annually.

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## About RETRIDOL

The Regional Training and Research Institute for Distance and Open Learning (RETRIDOL) is an international institute established under a collaborative agreement between the Commonwealth of Learning (COL) and the National Open University of Nigeria (NOUN) in 2003. It is mainly for capacity building and research in Open and Distance Learning (ODL) for the West African sub-region, and anywhere in Africa when the need arises.

The primary purpose of the institute is in three broad but interrelated parts: first, the institute has the mandate to plan and implement programmes to meet the training and capacity development needs of practitioners of open and distance learning-administrative, technical/technological and academic within the West African sub region.

Second, the institute is mandated to initiate, carry out, and support research in all areas of open and distance learning and its ancillary fields. While the institute facilitates research into open and distance learning as a field of enquiry, it is also involved in promoting discipline-based researches which have implications for open and distance learning. In doing this, the institute is expected to provide necessary training in research, and support to early career researchers and experienced academics undertaking research. The institute is also required to provide opportunities for the dissemination of research outcomes through its dedicated website, newsletter and regular journal.
The third strand of RETRIDOL's mandate is to serve as a platform for intra-regional and inter-regional cooperation and linkages between open and distance learning institutions, organisations and professional associations in West Africa and the rest of the world.

RETRIDOL is domiciled within the National Open University of Nigeria, Abuja, Nigeria. The vision of the institute is to be seen as a centre of excellence in open and distance learning in the West African sub-region through the promotion of workable policies, development of accountable strategies, the promotion of useful research activities, networking and collaboration for the purposes of attaining excellence in open and distance learning.

To achieve its mandate, the institute has been focusing on meeting the training needs of open and distance learning institutions including single-mode, dual-mode, consortium and solely electronic modes in the West African sub-region. This way, it intends to build a network of open and distance learning trainers and core professionals in ODL in the sub-region.

More than thirty institutions have participated in various RETRIDOL activities from The Gambia, Sierra Leone, Ghana, Cameroon, Nigeria and Tanzania over the last few years to respond to various needs. Many more are expected to participate in the future. The feedback from many of the institutions and individual participants has been very encouraging. The institute has its activities supervised by an International Advisory Board with members from the Commonwealth of Learning and the West African sub-region.

## Profil de RETRIDOL

L'Institut régional de formation et de recherche en enseignement à distance (RETRIDOL) est un institut international établi dans le cadre d'un partenariat entre le Commonwealth of Learning et la National Open University (NOUN). Il est, avant tout, destiné à la formation et la recherche dans le domaine de l'enseignement à distance (FOAD) pour la sous-région de l'Afrique de l'Ouest, et partout en Afrique en cas de besoin.

Le rôle principal de l'institut se répartit en trois volets, à la fois vastes mais complémentaires. D'abord, l'institut a pour mandat de planifier et de mettre en œuvre des visant à répondre aux besoins de formation et de développement des capacités des professionnels de l'enseignement à distance – soit administratif, techniques/technologiques et intellectuels dans la sous-région de l'Afrique de l'Ouest.

Deuxièmement, l'institut a pour tâche d'initier, de réaliser et de renforcer la recherche dans tous les domaines de l'enseignement à distance et les champs auxiliaires. Alors que l'institut sert à faciliter la recherche sur l'enseignement à distance en tant que domaine de recherche, il est également impliqué dans la promotion de recherches à caractère strictement spécifique qui ont des significations pour l'enseignement à distance. Pour ce faire, l'institut est supposé assurer la formation nécessaire à la recherche et fournir un soutien aux chercheurs débutants et aux universitaires expérimentés pour mener à bien leurs recherches. L'institut est également tenu de fournir des opportunités de diffusion des des résultats de la recherche par le biais de son site web, son bulletin d'information et sa revue officielle.

Le troisième volet du mandat de RETRIDOL consiste à servir comme base pour la coopération intra-régionale et inter-régionale et ainsi que la connexion entre institutions, organisations et associations professionnelles d'enseignement à distance en Afrique de l'Ouest et dans le monde entier.

RETRIDOL est abrité au sein de la National Open University du Nigeria, Abuja, Nigeria.

La vision de l'institut est d'être un centre d'excellence de l'enseignement à distance dans la sous-région ouest-africaine par la promotion de mesures pratiques, le développement de stratégies pertinentes, la promotion d'activités de recherche bénéfiques et l'initiation de réseaux, ainsi que des collaborations dans le vue d'atteindre l'excellence dans l'enseignement à distance.

Pour réaliser son mandat, l'institut s'est consacré à la satisfaction des besoins de formation dans institutions d'enseignement à distance, y compris les instituttions de mode unique ou le mode mixte, ansi que le consortium et le mode uniquement électronique dans la sous-région ouest-africaine. De cette façon, il a l'intention de construire un réseau de formateurs de l'enseignement à distance et un noyau de professionnels de l'ensignement à distance (LD) dans la sous-région.
Au cours des dernières années, plus de trente institutions de la Gambie, du Sierra Leone, du Ghana, du Cameroun, du Nigeria et de la Tanzanie ont participé à diverses activités RETRIDOL pour répondre à divers besoins. Nous espérons que beaucoup d'autres institutions devraient y participer dans les années prochaines. Le feedback de la part de nombreux participants individuels et des institutions participantes sont très positifs.

Les activités de l'institut sont supervisées par un conseil consultatif international composé de membres du Commonwealth of Learning et d'autres membres sont la sous-région de l'Afrique de l'Ouest

# EDITORIAL

We are pleased to announce that WAJOFEL is now indexed in the Directory of Open Access Journals (DOAJ). This is indicative of our continued commitment to quality and excellence in scientific communications. In this issue, the focus is on the transformative potential of open, distance, and eLearning (ODeL) to democratise education and improve learning outcomes. Featuring eight research articles, this issue covers a broad spectrum of themes from enhancing accessibility of open educational resources (OER) to assessing the efficacy of blended learning models, teaching and learning approaches to STEM, ICT integration, impact of online learning in various contexts, catering to the needs of vulnerable learners. The issue also features a reflective piece on recent developments in inclusive open and distance learning in the commentary section. These contributions enrich the discourse on ODeL, providing valuable insights to policymakers, educators, and researchers in their efforts to support access to education, social inclusion, and improve learning experiences across diverse contexts in Africa.

**Adedokun-Shittu, Mejabi, Olasehinde-Williams, Yusuf, Abdu Raheem, Ahmed and Ajani** explore the impact of the Glocalise approach to STEM education in Nigeria. Their study demonstrates the effectiveness of the approach in empowering learners by reducing fear associated with STEM subjects, providing more engaging and culturally relevant learning experiences.

**Qua-Enoo, Bervell, Nyagorme and Edumadze** investigate students' readiness for ICT integration in distance learning at the tertiary level in Ghana. In the light of their findings which include low computer literacy among students, effective albeit low presence of online study communities, they underscore the importance of computer literacy and online study communities in Ghana for a successful and seamless ICT integration.

**Akande and Adebanjo's** study focuses on the impact of video instructional techniques on vulnerable learners in secondary schools in Nigeria. In comparison to instructional contexts where they are not used, he showcases the positive influence of instructional videos in enhancing

learning outcomes of vulnerable learners and recommends their integration into teaching strategies.

**Kalu-Uche and Adolphus** assess the readiness of science teachers and level of adoption of blended learning in science teacher education programmes post-COVID-19 in South-East Nigeria. Noting low adoption rates, they recommend the incorporation of learning management systems to provide a platform for training opportunities on the use of blended learning for pre-service teachers.

**Akpan, Mayowa-Adebara, and Oluwatuyi** report on the findings of their study that investigated the inclusion of disadvantaged individuals in university education in Nigeria. Using the National Open University as a case study, their investigation of inmates in correctional facilities receiving higher education reveals a positive impact on their self-actualisation and of employment opportunities post-incarceration. They advocate for enhanced support to reduce recidivism.

**Wiredu, Asante, and Alagbe's** study evaluate the impact of a blended learning model on students' outcomes in a Master of Philosophy distance learning programme at the Kwame Nkrumah University of Science and Technology, Ghana. Their study underscores the advantages of flexibility and content in the integration of online systems with in-person instruction as one of blended learning models' most impactful aspects.

**Adelakun's** study examines public opinion on integrating open courseware into social media platforms as open educational resources with focus on instructional videos at the National Open University of Nigeria. The study reveals positive perceptions and advocates its adoption to enhance openness and user confidence.

**Majebi, Agbebaku, Adegbola, Ume, Omuya and Okunade** analyse students' perceptions of the efficiency of facilitation in an online context at the National Open University of Nigeria, highlighting its positive impact on learning efficiency, flexibility, and computer proficiency.

In the commentary section of this issue, is a reflective piece titled, *Reflections on recent developments in inclusive open and distance*

*learning* by **Letseka, Akintolu** and **El-bahay,** from the UNESCO Chair in open and distance learning at the University of South Africa.

Finally, we want to sincerely appreciate our reviewers for their dedication and commitment to quality as exemplified by their rigorous review of the published papers.

**Professor Christine Ofulue**
*Managing Editor*

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# Contextualising STEM Learning: The GLOCALISE Approach and Web Repository

# Contextualiser l'Apprentissage STEM : l'Approche GLOCALISE et le Référentiel Web

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## Abstract

*The consequences of failing Science, Technology, Engineering and Mathematics (STEM) subjects have led students and parents to seek for shortcuts to pass the subjects. These failures have effectually tolled Nigeria's human capital. In finding a solution to this quagmire, questions such as: can learning STEM ever evolve from fearful to fun-full? how can the fears be regenerated to fun? what are the expectations of learning fun-fully? Can digital platforms be made available to support learning fun-fully? These questions among others served as the foundational purpose of this study. A mixed method research design was employed to examine STEM students and teachers' reaction towards using contextualised instructional approach "Glocalise". The researcher generated and provided answers to two major research purposes. Multistage sampling technique was employed in selecting 11 secondary schools; 40 teachers; and 127 students. A validated researchers-designed questionnaire with a reliability value of 0.84 was used as the research instrument. The GLOCALISE web repository link*

[1] https://orcid.org/0000-0003-1561-7508 [2] https://orcid.org/0000-0002-8926-8147
[5] https://orcid.org/0000-0002-9188-4002 [6] https://orcid.org/0000-0003-2708-9116
[7] https://orcid.org/0000-0002-9829-6756

*https://sites.google.com/view/projectglocalise/home was created for students and teachers' open access. The outcome of this study indicated that unlike the conventional approach, the Glocalise instructional approach provided ease of content retention and empowers students' cultural orientation in learning STEM by bridging the gap from abstraction to concretisation. Thus, recommending that with Glocalise, the fear and panic for STEM subjects among students could be doused, and the practice of contracting machinery for examination by parents could be easily halted. While also learning sciences in a fun and self-paced way with the GLOCALISE repository.*

***Keywords*:** GLOCALISE, STEM Education, Contextualisation, Activity-based learning, Inquiry-based learning, Problem-solving

**Résumé**

*Les conséquences de l'échec dans les matières Scientifiques, Technologiques, Techniques et Mathématiques (STEM) ont conduit les élèves et les parents à chercher des raccourcis pour réussir ces matières. Ces échecs ont effectivement eu un impact sur le capital humain du Nigeria Pour trouver une solution à ce bourbier, il faut se poser des questions telles que : l'apprentissage des STEM peut-il passer de la peur à l'amusement? comment les peurs peuvent-elles être transformées en amusement? quelles sont les attentes en matière d'apprentissage ludique? Des plateformes numériques peuvent-elles être mises à disposition pour soutenir l'apprentissage ludique ?Ces questions, entre autres, ont servi de base à cette étude. Une conception de recherche mixte a été utilisée pour examiner la réaction des étudiants et des enseignants en STEM à l'utilisation de l'approche pédagogique contextualisée "Glocalise". Le chercheur a généré et fourni des réponses à deux objectifs majeurs de la recherche. Une technique d'échantillonnage à plusieurs niveaux a été utilisée pour sélectionner 11 écoles secondaires, 40 enseignants et 127 étudiants. Un questionnaire validé conçu par les chercheurs avec une valeur de fiabilité de 0,84 a été utilisé comme instrument de recherche. Le lien du référentiel web GLOCALISE https://sites.google.com/view/projectglocalise/home a été créé pour un accès libre des étudiants et des enseignants. Les résultats de cette étude ont indiqué que contrairement à l'approche conventionnelle, l'approche pédagogique Glocalise facilitait la rétention du contenu et renforçait l'orientation culturelle des étudiants dans l'apprentissage des STEM en comblant le fossé entre l'abstraction et la concrétisation. Ainsi, cette étude recommande que grâce à Glocalise, la peur et la panique pour les matières STEM chez les étudiants pourraient être atténuées, et la pratique de recourir à des moyens détournés pour les examens par les parents pourrait être facilement stoppée.*

*Tout en apprenant également les sciences de manière ludique et autonome avec le référentiel GLOCALISE.*

***Mots-clés*** **:** GLOCALISE, Éducation STEM ; Contextualisation ; Apprentissage basé sur l'activité ; Apprentissage par l'investigation ; Résolution de problèmes.

## Introduction

In an average Nigerian students' heart is the fear for Science, Technology, Engineering and Mathematics subjects (STEM). In fact, the mere mention of science sparks panics in their circle. Also, the shame of failure for both teachers and students remains one of the causes of unending examination malpractice during internal and external examinations. Consequent to this fear, most Nigerian parents spend humongous amount yearly to provide extra classes to their ward(s), while some other parents will rather employ a "machinery" to write their ward's examination. All these are done to rescue the student to scale through failing STEM subjects. The consequence of these bad actions keeps contributing to the currently experienced situation in Nigeria.

Unfortunately, the consequence of the fear leading to the provision of shortcuts to pass the subjects has effectively created multiples of quack professionals, and wreck Nigeria's human capital. In finding a solution to this quagmire, questions such as: can learning STEM ever evolve from fearful to fun-ful? Can teachers change students' mindset towards STEM to be an exciting experience? How should students' learning be designed? What are the expectations of learning funfully? Can a contextualised digital platform be developed to make learning STEM accessible to all? These questions among others served as the foundational purpose for this study.

As reflected in Nigeria's National Policy of Education, the Nigerian educational system is categorised into three promotional levels: basic education; post-basic and career development (PBECD); and tertiary education. Basic education comprises early child care development education (ECCDE), pre-primary education, primary education, and

junior secondary education. The PBECD consists of senior secondary education, technical and vocational education and training (TVET). The tertiary education includes university education, teacher education, technology education, and innovation enterprise institutions (Federal Republic of Nigeria, FRN, 2014). It is important to emphasise that at each level; students are expected to achieve different objectives and goals. Important among these objectives as stated in Nigeria's educational goal is the development of appropriate skills, mental, physical and social abilities and competencies to empower Nigerians to live in and contribute positively to the society. The question is, how does a Nigerian contribute positively if not nurtured to acquire the 21st century knowledge and skills? While differences are observed across how the skills are categorised or interpreted, commonalities do exist. The common skills across most studies include critical, creative, collaborative, communication, caring and thinking skills (Hashim, 2021).

Empirical evidence abounds on the relationship that exists between 21st century skills and STEM education. STEM as a subject in Nigeria include: Physics, Chemistry, Biology, Mathematics, Computer Studies/Information Technology, Basic Science and Technology, and Introductory Technology. STEM describes an embodiment of intellectual and practical endeavour encompassing the systematic study of the behavioural and structural pattern of the natural and physical world by way of observation, experimentation and manipulation to better human existence. The subjects of STEM seek to advance logical understanding and provide reasonable explanations of occurrences which have occurred, occurring and/or will occur. By implication, this means that the understanding of the learning of STEM is sensitive and strongly required for ease of human existence. This recognition has prompted stakeholders in developed countries to start changing STEM curriculum to capture these 21st century skills in order to prepare students for a newer and future life (Alismail & McGuire, 2015). Regrettably, the last reviewed curriculum in Nigeria was approved in 2013, and implemented in 2014. This means Nigeria still runs the same curriculum in the last 7 years.

Studies in the last five years provide an understandable trend into how STEM has evolved and the results of different approaches employed in teaching the subjects in Nigeria. Among many others is the study of Abanikannda (2016) who triangulated the studying of Chemistry with newer learning approaches and tools. The researcher asserted that newer learning approaches such as multimedia and hypermedia aided instruction is beneficial as it engages students' interest, and encourages them to collaborate, enquire, and to explore effectively, far beyond the bounds of school. Despite the outcome of the study and wide adoption of digital tools in some Nigerian schools, the performance of students in Chemistry remains unimproved (WAEC, 2017, 2019). Also, the compulsory subject nature of Biology as a STEM subject in Nigerian schools has ranked it as the most enrolled STEM subject (WAEC Report, 2018). The subject equally enjoys low academic performance. Evidence regarding this include the studies of Abimbola (2013), and Abanikannda (2018) who have continually drawn attention to the grave consequences of constant decline in Biology performance. Abimbola (2013) and Ndioho (2017) analysed that within two decades; 1991 to 2011, there was no significant rise in Biology performance. Within the 2 decades, the performance never rose above 60%, until 2016 when the performance rose to 75%. Since then, it has continued to decline (WAEC, 2019). This greatly indicates that there are imminent issues characterised with STEM teaching and learning in Nigeria.

In a Computer studies curriculum review conducted by Adedokun-Shittu et al., (2019) to torchlight the current practice and gaps in the curriculum in meeting 21st century standards, the researchers concluded that the curriculum is archaic and not commensurate with global best practice. With emphasis in the National Policy of Education (FRN, 2014), the Nigerian goal of education is strategically aimed at: effecting national development, while primarily concerned with inculcating national consciousness and national unity among the students; inculcating the right type of values and attitudes for the survival of the individual and the Nigerian society; training of the mind in the understanding of the world around; acquisition of appropriate skills, abilities, and competencies, both mental and physical as equipment for the individual to live in and contribute to the development of Nigeria (FRN, 2014). As beautiful as the lofty goal and

the purposes are, Nigerian education is still struggling to keep up the pace with international standards.

Researchers such as Seage and Türegün (2020) claimed that stakeholders' view towards STEM education as a tool is to prepare and empower students with skills for careers of now and the future. Hence, blended learning has come into focus, as it aims to provide these benefits to students. Although there is a general agreement that STEM is a necessary component of the curriculum, however, the practical implementation of STEM programs has seen a variety of forms, including standardization among STEM curricula. For example, Brown (2012) averred that the quality of STEM curriculum implementation depends largely upon funding. That is, schools with higher funding often have larger and more elaborate STEM programs and resources, thus, enabling them to succeed, compare to those with lower or no resources. Unfortunately, such equity issues are far too common in traditional education. To bridge this gap, contemporary, universal, flexible, and easy to adopt approaches are necessary to solve these issues, but in a contextual manner.

Furthermore, in providing succour to this STEM quagmire, this study conceptualised contextualization learning approach, tagged "GLOCALISE" to torchlight the existing practice. Indicatively, Fitzallen (2015) suggested that there are various ways in which teachers can associate STEM with students' everyday lives, both inside and outside the classroom, and creative approaches can be extremely effective in this regard, which enable students to approach science from fresh perspectives. Moreover, cross- curricular approaches to STEM teaching can be highly motivational for both teachers and students, this is however often constrained by national curricula, there is no requirement for subjects to be taught discretely, and they can be grouped or taught through projects.

Considering the essential value of culture, tradition and history in bringing STEM to life, our customs and everyday events could be cited to explain different STEM concepts. Like a baby's excitement at his first step towards walking? Students need to discover new things at each step in their learning. More to that, each discovery should be

impactful and lasting. To create such an impression, teachers should not just provide content but rather provide insightful clues and queries that will trigger students' critical thinking ability. This intellectual drill will not ignite, unless students are challenged with creative activities to solve real-life problems. As they learn, apply their skills to change our immediate environment for the better, our education becomes meaningfully outcome-based. Thus, both our students and teachers transform into innovative creators, not just graceful consumers.
Glocalise's approach aims at re-purposing teaching to be learner-centred through inquiry-based, contextualised and learner-engaging methods. Contextualised in the form of embracing cultural phenomenon and resources to triangulate concepts' understanding, especially within the context of the Nigerian educational system. Nigeria as a country is rich and diverse in culture, it is hoped that when its culture is explored and learning is put in the context of the learners, they will learn better. The subject focus of the project is STEM because it is a field that requires inquiry, creativity and collaboration. It demands learner-engagement through hands-on activities to ensure they gain insights into understanding scientific concepts, and revolutionising them into problem-solvers. This implies that pedagogical methods and practices in STEM should be creatively and flexibly developed to ensure that both students and teachers can collaborate on problem-solving and inquiry-based ventures thereby becoming not just consumers but creators of innovative practices and methodologies.

Contextualised learning approach is a learner-centred approach that has inquiry-based, learner engagement and learner-context as key elements (Adedokun-Shittu, et al., 2018). Learner-context, interchangeably used as student-context is an important aspect of learner-centred approach which encourages active participation of students in their own learning and emphasises situating learning in their immediate environment and their lived experiences. Numerous theories exist in promoting learner-context learning, among which are: Anchored instruction or situated Cognition learning, active learning model, discovery learning, constructivist approach, Cooperative/collaborative learning, connectivism and a host of others.

With the advent of technology, various networking and collaborative tools of learning are now being harnessed to support learning. Multiple formats of learning presentation such as visual, audio, pictorial, textual and animated resources can also be shared to support collaborative learning. All these theories have their own limitations and may not be isolated in all cases, but a meaningful combination and integration of them can produce a fruitful learning outcome in students (Adedokun-Shittu, et al., 2018). Bruner (1957) stressed that to instruct someone is not a matter of committing results to mind but to teach him to participate in the process of knowledge establishment. He emphasised that subjects should be taught not to produce little living libraries on the subject, but to get a student to think critically and constructively.

Scientists (past and present) observed phenomena and their surrounding environment before they came up with conclusions and formulated theories that became widely known and the premise for all we study in various fields today. It then baffles the mind why teachers teach students of contemporary times to study those theories but not study phenomena, draw conclusions, confirm or reject previous theories and come up with observations that can later metamorphose into theories. Global practices support finding new knowledge but the developing world is still stuck to regurgitating existing knowledge.

As a progressive nation, we can save our future generation from reinventing the wheel, only when we take a bold and giant step in creating knowledge too, rather than merely consuming knowledge created by others. This can start when we imbibe in our students the culture of observing, problem-solving, inquiring, cooperating on tasks, and coming up with their own answers and solutions to problems rather than being fed with old tales of the past formulated by geniuses of those times. It's high-time we created the geniuses of our own and future generation!

## Research Questions

This study examined STEM students and teachers' reaction towards using contextualised instructional approach (Glocalise). Two major research questions were raised and answered. These included:

1. How do students react to the Glocalise instructional approach in learning STEM subjects?
2. What is the reaction of teachers to the Glocalise instructional approach in teaching STEM subjects?
3. What are the procedures involved in developing a Glocalise repository for aiding STEM in an in-class or distance learning?

## Methodology

This study adopted a mixed research design, while targeting secondary school students and teachers in Nigeria. A multistage sampling technique was employed to select the sample size: the first stage included a stratified sampling technique to select 11 secondary schools across Kwara state, Nigeria; and the second stage employed a simple random sampling technique was employed to select 127 STEM students and 40 STEM teachers across the 11 sampled schools to serve as the participants for the study.

Three researchers-designed instruments were employed in this study: a contextualised lesson plan activity for each STEM subject; a reaction questionnaire with 2 sections. Section A of the instrument solicited for the demographic data of the respondents; Section B was interested in students' reaction to Glocalise approach. Section B was rated on a modified Likert Mode Scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) with weighted value of 4 to 1 in terms of scoring; and an interview guide to examine the teacher' reaction to Glocalise approach. In ascertaining the reliability coefficient of the questionnaire, Cronbach Alpha Coefficient was used to determine the internal consistency reliability of the instrument revealing a value of 0.84. The data collected were analysed using descriptive and inferential statistics with the use of Statistical Package for Social Sciences (SPSS) software version 24.0. Descriptive statistics and content analysis were used to answer the research questions.

With considerations for the ethical concerns of participants in this study, the researchers sought consent of the respondents and subsequently informed them about the study procedure and the

importance of the study. The study procedure included: the researchers trained all the teachers involved in the study with a validated training guide, thereafter the teachers taught the students with the Glocalise approach. The teachers used different environmental resources such as explaining the concept of projectile in Physics with local idioms, proverbs and games. The respondents were not compelled to respond to the instrument and voluntary participation was ensured. All the respondents were given a sense of autonomy, and anonymity, confidentiality and privacy of the respondents were maintained and considered. Data collected were treated with utmost confidentiality and anonymity.

## Results

This study was conducted to examine STEM students and teachers' reaction towards using contextualised instructional approach (Glocalise) through an actual classroom experiment and survey. The data collected were analysed using statistical mean, standard deviation, and content analysis approaches. Quantitatively, a benchmark of 2.50 was employed to ascertain science students' reaction to Glocalise instructional approach, indicating that a value less than 2.50 was regarded as negative, while value higher than 2.50 was regarded as positive. Results of the analysis is shown on Table 1 and interpreted as thus:

**Research Question One:** How do students react to the Glocalise instructional approach in learning STEM subjects?

**Table 1:** Students' Reaction to Learning STEM Using Glocalise Approach

| S/N | Items | Mean | S. D. |
|---|---|---|---|
| 1. | The idea of thinking globally and acting locally is new and innovative. | 3.51 | 0.69 |
| 2. | Concretisation of Science concepts was easy because of the realistic examples cited in the course of the lessons. | 3.24 | 0.72 |

| S/N | Items | Mean | S. D. |
|---|---|---|---|
| 3. | I developed more interest in learning the subject contents, because of the practical activities utilised in teaching the subject contents | 3.35 | 0.85 |
| 4. | Using songs to capture lesson contents was makes the class entertaining | 3.41 | 0.68 |
| 5. | When the instructor used my cultural proverbs to explain learning contents, I was amazed and I found the lesson comprehensible | 3.21 | 0.84 |
| 6. | Employing my local games to conceptualise the subject contents make the concepts easy to learn | 3.35 | 0.77 |
| 7. | The combination of visual, auditory and learning by doing that was involved in learning the subject contents empowers me in getting actively involved in the classroom. | 3.49 | 0.67 |
| 8. | Boredom was easily eliminated because I was participatory in the learning activities | 3.44 | 0.60 |
| 9. | With the Glocalise approach, I found my environmental resources as useful resources that can help in creating products. | 3.35 | 0.66 |
| 10. | Contextualising Science subjects has empowered me with the capability of being able to evaluate life occurrences and relate them with subject contents | 3.53 | 0.66 |
| 11. | Storytelling and tales that were used in learning concepts make the lesson interesting | 3.20 | 0.84 |
| 12. | I didn't know the local resources found in my immediate environment could be used in learning the concepts taught | 3.17 | 0.89 |
| 13. | Using the local situations to explain how concepts align to the topic taught make the lesson interesting | 3.25 | 0.78 |
| 14. | Actively, I can relate different Science concepts to realistic life events and further to provide solutions to life problems such as product creation | 3.09 | 0.86 |
| 15. | Using the cultural orientation in learning Science subjects helped me in bridging the gap from abstraction to concretization | 3.24 | 0.87 |

| S/N | Items | Mean | S. D. |
|---|---|---|---|
| 16. | Contextualising the Science learning contents is not a waste of time | 3.38 | 0.79 |
| 17. | As much as contextualisation could be a waste of time, I found it interesting and easy to use | 3.48 | 0.64 |
| 18. | Contextualising Science concepts seems simple | 3.46 | 0.64 |
| 19. | Learning with the contextualisation approach offers me a reality experience which simulate self-activity on my part. | 3.21 | 0.78 |
| 20. | The Glocalise approach embraces independent learning. | 3.27 | 0.77 |
| 21. | With the learning by doing feature of contextualisation, I found it easy to remember the concepts learnt. | 3.46 | 0.70 |
| 22. | I look forward to the use of Glocalise in other subjects. | 3.35 | 0.75 |
| 23. | The Glocalise approach logically covers various lesson contents. | 3.16 | 0.86 |
| 24. | The concepts taught using Glocalise seems all-encompassing | 3.19 | 0.80 |
| 25. | Getting integrated in the lesson activities was easy when learning with Glocalise compare to other approaches | 3.06 | 0.90 |
| | **Grand Mean** | **3.31** | |

Table 1 revealed students' reaction to learning Science using the contextualised learner-centred approach (Glocalise). Based on the benchmark of 2.50, all the items have mean values greater than the benchmark. This indicated that students agreed to all the items. Indicatively, the contextualisation approach in learning STEM subjects empowers students to evaluate life occurrences and relate them with subject contents; contextualisation is new and innovative; contextualisation is not a waste of time. Even if more time is required to be spent, it is still interesting and easy to use; the combination of visual, auditory and learning by doing empowers students to actively involved in the classroom; environmental resources are useful resources that can help in learning and creating products; learning by doing feature of contextualisation, makes content retention easy;

contextualising Science concepts is simple; cultural orientation in learning Science subjects helped in bridging the gap from abstraction to concretisation; using local games to conceptualise Science subject contents make the concepts easy to learn; contextualisation kills boredom; contextualising contents through songs makes the class entertaining; among others. In conclusion, the grand mean of 3.31>2.50 revealed that contextualised learner-centred approach was positively reacted to among Science students.

**Research Question Two:** What is the reaction of teachers to the Glocalise instructional approach in learning STEM subjects?

Qualitatively, a thematic approach was employed to analyse the data collected through an interview that was conducted among 40 STEM-focused teachers to ascertain their reaction to the contextualised learner-centred teaching approach.

Do you think teaching Science subjects with this method is appropriate?

*Generally, Science educators claimed that they found the approach to be new, unconventional and unpopular. They asserted that the approach seemed unclear at the beginning, but along the line, they got integrated into the approach*.

Having put the school's designated time and period into consideration, do you think the activity approach of this method can capture the lesson contents sufficiently?

Significant among the responses of the teachers, some Physics and Chemistry teachers elucidated that due to the nature of their subject, they found it easy to capture other subject contents that are related to the contents currently being taught in the classroom. *One Chemistry teacher says: "I can easily teach motion, force, and projectile in one singular class, because students can easily relate each concept to the other and solve problems relating to these concepts, compared to the conventional approach I am used to."*

While using the Glocalise approach, what is your assessment of students' active involvement in the lesson?

*"…on the part of the student, I have never found my students exchanging ideas like this before. They were collaborating and seeking to find answers to valid self-generated questions, and it was amazing seeing them proffering solutions to these questions." This is one of the many positive responses from teachers that used this approach. Generally, teachers found the approach to be engaging and actively involve students in classroom activity."*

With your vast experience in teaching Science subjects, do you think this approach would be better as a stand-alone or be an integrative approach to conventional approaches?

Most approaches are better when used together with other approach. Teaching is more concretise when a combination of approaches is employed, and Glocalise is no exception. *"The nature of Glocalise seems to include student-content method, play way method, inquiry method, and collaborative method. These are the ones I can remember now. When I explore the approach further, I am sure I will be able to use another approach with it."*

In comparison, what is your assessment of the Glocalise approach and other teaching approaches?

*"Very good, but excellent when other approaches are employed with it. However, student and content centred approaches would be more precise with Glocalise than any other approach."*

Does this approach provide an avenue for you as a teacher to conduct formative evaluation at all?

*"…Yes! In fact, I found it easier than my previous approaches." From questions that are self-generated by the students, and students' ability to easily identify the environmental resources that are useful to the current contents being taught, the knowledge path can be easily drawn and formative evaluation is easily done.*

Class control and management have been very important to Science learning, does the Glocalise approach give you better classroom control compared to your regular style?

*"With students being collaboratively involved in the class activity, students were attentive and classroom pollution such as noise is reduced. However, teachers need to be cautious of how open the class is, and equally limit the level of student self-exploration."*

Do you think this approach is suitable for all subjects or just Science subjects only?

Using this approach seems excellent for Science subjects, but it won't be bad to use it in other non-science subjects. *One Mathematics teacher averred that "Glocalise can easily be used in teaching commercial subjects, especially Business Study. Importantly, Market Structure could be taught using Glocalise to better explain the concept of market Structure."*

Having put students' individual characteristics in mind, does this approach provide the same learning pace to all?

All students were easily integrated in the classroom activity. *"I am amazed to see the script of one of my low-level learners scoring more than average score in the classroom test. This was shocking because I had advised the parent to seek special attention for the kid." This is amazing and I just want to use this approach in other subjects.*

Generally, this approach was widely accepted and STEM teachers have a positive reaction to Glocalise as an instructional approach.

**Research Question Three:** What are the procedures involved in developing a Glocalise repository for aiding STEM in an in-class or distance learning?

Google sites was used to develop Glocalise. It contains the Homepage which links to Glocalise Videos, Activity sheets, tools, resources and

Audios. Every section has its content correlated with it. The homepage also entails Glocalise social media platforms, Facebook, Instagram and YouTube. The page url: https://sites.google.com/view/projectglocalise/home


Figure 1: Screenshot of the Glocalise Repository

**Discussion of Study**

This study examined STEM students and teachers' reaction towards using contextualised instructional approach (Glocalise) through an actual classroom experiment and survey. This study found that contextualisation approach in learning STEM subjects empowers students to evaluate life occurrences and relate them with subject contents. Unlike the conventional approach, the activity-based and involvement of environmental resources and culture aid students' understanding of STEM concepts. Glocalise approach provides ease of content retention and empowers students' cultural orientation in learning STEM by bridging the gap from abstraction to concretisation. This finding is supported by the earlier study of Fitzallen (2015), who provided insights to how cultural and environment resources could influence STEM learning. He concluded that contextualisation in

learning STEM will provide continuous understanding to students' daily life experiences. This outcome implies that Glocalise has the capability to provide students with the ability to relate different STEM concepts to every activity happening in their real environment.

This study also investigated STEM teachers' reaction to Glocalise instructional approach through a guided interview. Generally, teachers reacted positively to the Glocalise instructional approach. They claimed that Glocalise was new, unpopular, and unclear when they started using the approach, but they consequently got integrated into the approach. Teachers equally accented that Glocalise is encompassing, that is, different related concepts can be taught in a singular class, unlike the conventional scheduling approach. Also, this study provided insight into the existing practice and its consequences on students' academic performance. Importantly, Glocalise instructional approach evidently provided a paradigm shift to teachers' teaching activities and their classroom management role in the instructional process. Overall, this study supports the position of Adedokun-Shittu, et al., (2018) on contextualised learning approach. The researchers posited that learner-centred approaches encourages active participation of students in their own learning and emphasises situating learning in their immediate environment and their lived experiences. They concluded that this positive effect of contextualisation on students' learning will reflect on teachers' job responsibilities, thereby improving the instructional process, and ultimately affecting ease of achieving instructional objectives and goals.

Glocalise repository accessible at https://sites.google.com/view/projectglocalise/home gives teachers, learners and interested stakeholders free & open access to all Glocalise resources for teaching and learning in an in-class or distance learning.

## Conclusion and Recommendation

This study concludes that Glocalise instructional approach has the capabilities of revolutionising the practice of reinventing the wheel of Nigerian STEM students being knowledge consumers only, rather than

knowledge creators too. Thereby, saving the next generation from the current educational quagmire. Imbibing our cultural and environment resources into the instructional process could remodel students into excellent observers, problem solvers, astute inquirer, and providers of contextual solutions to our own problems, rather than being fed with old tales of the past formulated by geniuses of those times. Glocalise instructional approach could create the geniuses of our now and future generation.

Based on the conclusion, this study recommends that contextualise and activity-based instructional approach should be adopted in STEM classes, as this will provide opportunity for students to associate STEM with their everyday life, both inside and outside the classroom, and creative approaches can be extremely effective in this regard, which enable students to approach science from fresh perspectives. Moreover, cross- curricular approaches to STEM teaching can be highly motivational for both teachers and students. Glocalise instructional approach can ultimately revolutionise the appalling STEM performance in Nigeria secondary schools. With Glocalise approach and the web repository, the fear and panic for STEM subjects among students could be doused, the practice of contracting machinery for examination by parents could be easily halted and learning sciences become fun-filled and self-paced. Consequently, corrupt practices that accrue from fear of sciences will be nipped in the bud.

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# Distance Education in Ghana: Assessing Students Readiness for Information Communication Integration

# Éducation àDistance au Ghana: Évaluation de la Préparation Des Étudiants à l'Intégration des Technologies de l'Information et de la Communication

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## Abstract

*Distance education is increasingly becoming a major alternative to traditional education with higher institutions vying for global students over the past decade. This article assesses students' readiness for information and communication technology in distance learning in Ghana. Students from higher institutions were surveyed using the cluster sampling method. The SPSS version 21 software was used to analyse the data and generate both descriptive and inferential statistics such as cross-tabulation, chi-square and one-way ANOVA. The findings of the study included low computer literacy of computer-based online learning systems, high expenditure on internet data, and low but effective online study community using social media. Online resource usage categories were found to differ between students for different institutions. Also, confidence in using computer to learn does not correlate with internet usage history. The study concluded that solid foundation in computer literacy at the preceding educational level is critical to easy adoption and integration of ICT at the tertiary level. Finally, we recommend*

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*the promotion of more online learning communities for learners and with their lecturers.*

***Keywords***: ICT, Distance Education, Information Literacy, online community, internet cost, LMS

**Résumé**

*L'enseignement à distance devient de plus en plus une alternative majeure à l'enseignement traditionnel, les établissements d'enseignement supérieur se disputant les étudiants du monde entier au cours de la dernière décennie. Cet article évalue l'état de préparation des étudiants aux technologies de l'information et de la communication dans le cadre de l'enseignement à distance au Ghana. Les étudiants des établissements d'enseignement supérieur ont été interrogés à l'aide de la méthode d'échantillonnage en groupes. Le logiciel SPSS version 21 a été utilisé pour analyser les données et générer des statistiques descriptives et inférentielles telles que les tableaux croisés, le chi-carré et l'ANOVA à sens unique. Les résultats de l'étude comprennent une faible connaissance informatique des systèmes d'apprentissage en ligne basés sur l'ordinateur, des dépenses élevées en données Internet, et une communauté d'étude en ligne peu nombreuse mais efficace utilisant les médias sociaux. Les catégories d'utilisation des ressources en ligne diffèrent d'un étudiant à l'autre en fonction de l'établissement. En outre, la confiance dans l'utilisation de l'ordinateur pour apprendre n'est pas en corrélation avec l'historique de l'utilisation de l'internet. L'étude conclut qu'une base solide de connaissances informatiques au niveau éducatif précédent est essentielle pour faciliter l'adoption et l'intégration des TIC au niveau tertiaire. Enfin, nous recommandons de promouvoir davantage de communautés d'apprentissage en ligne pour les apprenants et leurs professeurs*

***Mots-clés* :** TIC, Enseignement à distance, Alphabétisation informationnelle, communauté en ligne, coût d'Internet, LMS

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## Introduction

The merger of Information and Communications Technologies (ICTs) and distance education has unleashed the full potential of infinite possibilities of educating both the masses and specific individual needs. The educational landscape is drastically shifting from the brick-

and-mortar environment to the interactive and customized learning environment. According to Hanna (2010) ICTs have the potential to aid economic growth and the improvement of social conditions in the developing world. Mensah and Owusu-Mensah (2002) also noted that the use of such technologies provides the opportunity for global networking, increased interactivity and more control for learners in a highly cost-effective manner. COL (2001) identified interactive ICT to support course delivery and learning as the fourth generation of distance education. The main mode of accessing distance education in sub-Saharan Africa is manually driven by face-to-face tuition and textbooks (Mensah & Owusu-Mensah, 2002; Agbanu, et al., 2018; Leary & Berge, 2007). Information and communication technology (ICT) is an innovative approach for delivering well-designed computer mediated, learner-centred and interactive learning environments ubiquitously by utilising the internet technologies concerned with instructional design principles (Moore & Kearsely, 2005).

Distance Education refers to the provision of opportunities to and eliminating unnecessary barriers for a diverse range of students in order to assist them to succeed in their education or training according to their specific needs and diverse learning settings (Butcher & Wilson-Strydom, 2008). ICT tools comprises of electronic devices which are utilised for information, by teachers and students. There have been several advocates for information technology (IT) integration into Distance learning to enhance the delivery of services to students by the main public universities in Ghana. However, several challenges need to be overcome ranging from political, institutional, self-efficacy, financial, human capacity to infrastructural issues. Several web-based distance education systems exist in addressing some of these challenges stated above. The features and benefits of learning management systems (LMS) have been enumerated (Watson & Watson, 2007; Learning Circuits, 2005; Pappas, 2014). The slow adoption of technology by distance education institutions in in Ghana continues to deny many senior high school (SHS) students from accessing tertiary education. LMS promoting social factors along with cognitive and behavioural components in increasing more adoption of

distance-learning systems (Leontyeva, 2018; Keller, et al., 2018; Liaw, et al., 2007; Chow & Croxton, 2017).

The Large class sizes, due to lack of adequate number of lecturers, continue to widen the existing large student-lecturer ratio in the traditional mode of tertiary institutions. Although distance educational departments of higher educational universities in Ghana are gradually integrating some of their services, several challenges persist. The purpose of this study is to assess the readiness of students for transitioning to technologically enhanced learning method. Many students have techno-pedagogical shock in the sudden transformation from paper-based instructional delivery to paperless one. DE institutions does not offer extensive help as these students transition from traditional mode to digital form of learning. A cursory investigation revealed that some DE students usually convert softcopies of lecture notes into hardcopies before studying them. Due to lack of internet facilities in some homes and learning centres, students often miss assignment deadlines and vital institutional information. Affordability of internet data and instructional electronic gadgets such as computers and modems have also been cited by students as a challenge in pursuing distance education.

## Research Questions

1. What is the computer information literacy of the distance education students?
2. What is the effectiveness of distance education student's online community?
3. What is the online resource usage categories of distance education students?

## Hypothesis

$H_0$: There is no difference in the internet expenditure of distance education students

$H_1$: Students confidence in using computer to learn do not correlate to with internet usage history

$H_2$: There is no difference in the online usage categories of distance education institutions

## Literature Review

Prior knowledge of a field of study by learners portends the acceptability, operational and successful completion of an educational experience. Computer technology savvy teacher has the capabilities to use instructional technology to help students advance their computer literacy via technology and use technology as a teaching tool (Jou & Wu, 2012; Anderson & Petch-Hogan, 2001). Computer literacy, Information Literacy, Media Literacy, Communication Literacy, Communication Literacy and Technology Literacy are sub disciplines of digital literacy (Özdamar-Keskin, & Royle, 2015). They also stated that learners believe that they have problem solving and project working skills to deal with educational difficulties although the learners had only basic competences. Internet Society (2017) noted that technology understanding can have a positive influence on funding and purchasing decisions about educational and information technology resources in schools and universities. Aralu and Adetimirin (2014) identified low computer literacy and cybercafé as the most available internet access point among 255 DE students of University of Legos. The importance of computer literacy and competency in online environments has been discussed in a number of studies (Lam, 2000; Oh & French, 2004; Shin & Son, 2007). Computer literacy is essential for participating in fourth and fifth generation distance education delivery technologies (Farajollahi, et al., 2015). Hussain and Farooq (2016) found that majority of student-teachers in ODL were not capable of using computer skills like Ms Word, Ms Power point, Ms excel and internet for their better professional growth. Loan (2011) stated 44.67 percent of students (302 out of 676) use the internet and more than half of the students — 55.33 percent (374 out of 676) do not use it at all. Poor technology skills is the top problem area of students compared to poor time management, poor online research skills and courseware problem. (Bozarth, et al., 2004). Belief in their own abilities influences students' willingness to use technology (Compeau & Higgins, 1995).

Funding distance education by students presents both covert and overt cost. The overt cost such as admission, school and transportation fees are usually budgeted for while the convert costs of feeding, internet cost, photocopies, supplementary instructional material, etc. left to vagary. 67% of respondents indicated higher distance education costs compared to face-to-face course costs (Poulin & Straut, 2017). Potential students are attracted to less burdensome options if institutions were to offer more flexible approaches to study that have a lower cost of provision and hence lower fees (Yuan, et al., 2014). Financial incapacity of students to meet internet data cost for instruction can result in student attrition. High student attrition have been well researched (Kember, 1989; Park & Choi, 2009; Diaz, 2002; Packham, et al., 2004; Bean & Metzner, 1985). The poor national socio-economic infrastructure poses a challenge to quality learner support in the developing countries (Gulati, 2008; Ouma, 2003).

The popularity of social media has spawned new forms of personal and social interactions in distance education. These online learning communities provides opportunity for large to small interactive discussions among students. Mahesh and Adithya Kumari (2014) observed rigidity and pedagogically over-structured, limits of teaching creativity, interactions and the methods used to prepare content by instructors. Social media facilitate collaborative and cooperative learning. The popular social media include Facebook, YouTube, wikis, twitter, WeChat, Skype, Duo, Zoom, Instagram, Google+ and Whatsapp. Current students are considered as the Net Generation or the digital natives. Students actively interact with their peers and lecturers as well as time engaging in active and collaborative learning activities (Kennedy, 2000; Laird & Kuh, 2005). There is a positive relationship between the use of purposeful social media and student engagement (Laird & Kuh, 2005; Zhao & Kuh 2004).

Online categories frequently engaged by DE students is indicative of their cyber preferences and perception. Armed with this knowledge, instructional designers can tailor instructions to enhance students' adoption. The ICT systems should also be designed in such a way that they fulfil the demands of the student. (Mafa & Mpofu, 2013),

Removal of barriers to effective online usage needs to be addressed at the macro level Tiwari and Tiwari (2010). Challenges such as lack of sufficient time for study, difficulties in access and use of ICT, ineffective feedback and lack of study materials were identified by Musingafi, et al., (2015).

## Research Methodology and Design

The authors used the research survey design method to obtain quantitative data for a quantitative analysis using descriptive and inferential statistics. A survey design is an approach that collects data through sampling from the population and uses statistical analysis to make inferences about the population (Curtis & Curtis, 2011). The target population was all distance education students of the four universities of Ghana including the University of Ghana (UG), University of Cape Coast (UCC), University of Education, Winneba (UEW) and Kwame Nkrumah University of Science and Technology (KNUST). The cluster sampling method was used to select the learning centres across 16 region of the country due to the wide geographical spread of learning centres. Out of the many questionnaires sent out, 297 students responded which included 26.2% (n = 77) from KNUST, 20.7% (n = 61) from UCC, 25.2% (n = 74) from UEW students and 27.9% (n = 82) from UG students. Questionnaires was the main sampling tool used to collect the data and it included close-ended and Likert scale questions. It was designed using both online using Google forms and paper format containing 19 questions separated into 4 main subheadings: demographics; computer literacy; online learning community; and online resource usage categories. A pilot study was done involving 51 participants, after permission was sought from relevant DE authorities and ethical considerations were done, to test the validity and reliability of the research sample tool. After modification and creation of a manual version of the questionnaires due to difficulty encountered by some participants, the sampling was done. The Cronbach's alpha test (α) was done to assess the internal consistency of the research data. α values if 0.6 and above is deemed acceptable. The Cronbach's alpha scores for modes of instructional delivery was 0.72, level of IT infrastructure integration was 0.68 and online learning tools self-efficacy was 0.85. Data analysis was done

using the SPSS version 21. Both descriptive statistics (such as mean, bar charts, frequency distribution tables, cross-tabulations and pie-charts) and inferential statistics (One-Way analysis of variance (ANOVA), chi-square, and Tukey homogeneity test) were used to explore relationships, effects, and/or comparisons among the research variables being investigated.

## Results

### Computer literacy of Participants

The computer literacy of participants is investigated using their knowledge of the Internet and how it is accessed as well as knowledge of e-learning and LMS.

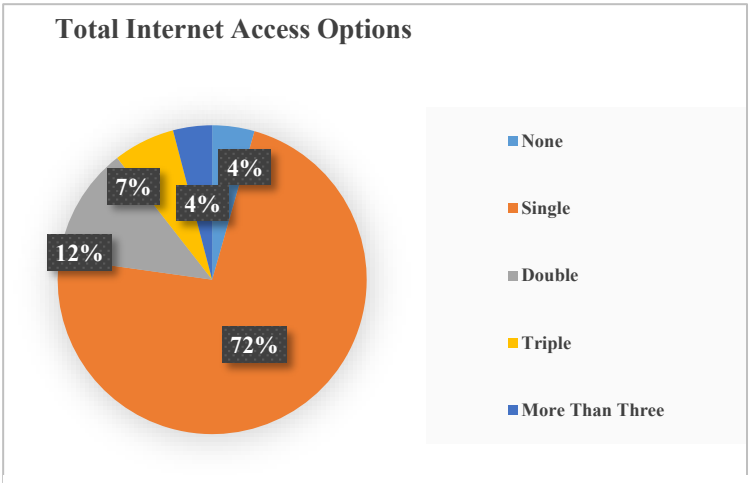


**Figure 1: Total Internet Access Availability**

**Figure 1** represents total internet options (smartphones, computer tablets, modems, internet café, school laboratories and office internet) available to the DE students. Only 13 (4%) participants had no internet access. Also, majority of them 214 (72%) had single access, 36 (12%) had dual access, 19 (7%) had triple access the rest 12 (4%) had more than three access.

**Table 1: Individual Internet Access Mode**

| | N | Sum | Percent (%) | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Via Smartphone | 294 | 157 | 53.4 | .53 | .500 |
| Via Tablet | 294 | 90 | 30.6 | .31 | .462 |
| Via Modem | 293 | 96 | 32.7 | .33 | .470 |
| Via Café | 294 | 27 | 9.2 | .09 | .312 |
| Via School lab | 294 | 20 | 6.8 | .07 | .252 |
| Via Office Network | 294 | 4 | 1.4 | .01 | .116 |
| Valid N (listwise) | 293 | | | | |

On individual access mode, the smartphone was the main internet access device 157 (53.4%), followed by Wi-Fi modems 92 (32.7%), and tablet 90 (30.6%) as **Table 1**. The least used options were internet cafés, school laboratories and office network with 27 (9.2%), 20 (6.8%) and 4 (1.4%) respectively.

**Table 2: Institutions offering E-Learning services**

| | Distance Education institution. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | KNUST | | UCC | | UEW | | UG | | Total | |
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| No | 17 | 14.5 | 50 | 42.7 | 46 | 39.3 | 4 | 3.4 | 117 | 41.2 |
| Yes | 53 | 40.5 | 1 | 0.8 | 8 | 6.1 | 69 | 52.7 | 131 | 46.1 |
| Not Sure | 5 | 13.9 | 10 | 27.8 | 15 | 6 | 41.7 | 6 | 36 | 12.7 |
| **Total** | **75** | **26.4** | **61** | **21.5** | **69** | **24.3** | **79** | **27.8** | **284** | **100.0** |

**Table 2** shows whether DE offered e-learning services to students. 117 (41.2%) participants said no, 131 (46.1%) participants said yes and 36 (12.7%) participants were not aware of it. KNUST and UG had more participants intimating e-learning services than absence compared to UCC and UEW participants.

**Table 3: Awareness of Learning Management System (LMS)**

| | KNUST | | UCC | | UEW | | UG | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| No | 57 | 27.9 | 55 | 47.0 | 50 | 24.5 | 42 | 20.6 | 204 | 74.2 |
| Yes | 18 | 25.4 | 6 | 8.5 | 16 | 22.5 | 31 | 43.7 | 71 | 25.8 |
| **Total** | **75** | **27.3** | **61** | **22.2** | **66** | **24.0** | **73** | **26.5** | **275** | **100.0** |

**Table 3** shows participants' knowledge of LMS. 204 (74.2%) students started in the negative while 71 (25.8%) stated in the affirmative. UG had more participants who knew about LMS than the other institutions. For the yes group, UCC had 8.5%, UEW had 22.5%, KNUST had 25.4% and UG had 43.7%.

## Funding Internet Cost

This section assessed the funding of internet cost by distance education students.

**Figure 2** shows the average money (in cedis) DE participants spend on data. 257 (86.5%) answered it while 40 (13.5%) declined. For every week 164(63.8%) spent less than 10 cedis, 65(25.3%) spent between 10 and 20 cedis, 21(8.2%) spent between 21 and 30 cedis, 3(1.2%) spent between 31and 40 cedis and finally 4(1.5 %) spent above 40 cedis. It was observed that majority of participants in institutions spent less than 31 cedis on data per week: 57 (93.4%) for KNUST, 58 (96.7%) for UCC, 64 (100%) for UEW and 71 (98.6%) for UG.

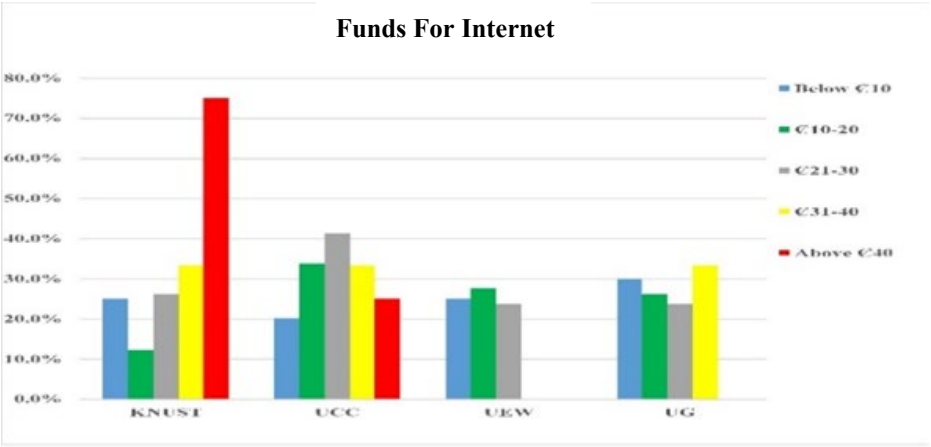


**Figure 2: Average weekly Internet cost by Institutions (in cedis)**

## Effectiveness of Students' Online learning Community

This section investigated the utilisation of IT (specifically social media) for effective peer studies.

**Table 4: Number of Online learning Community**

| | KNUST | | UCC | | UEW | | UG | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Freq.** | **%** | **Freq.** | **%** | **Freq.** | **%** | **Freq.** | **%** | **Freq.** | **%** |
| No | 41 | 28.5 | 30 | 20.8 | 39 | 27.1 | 34 | 23.6 | 144 | 51.2 |
| Yes | 34 | 24.8 | 30 | 21.9 | 31 | 22.6 | 42 | 30.7 | 137 | 48.8 |
| **Total** | **75** | **26.7** | **60** | **21.4** | **70** | **24.6** | **76** | **27.0** | **281** | **100.0** |

**Table 4** shows the participants that used IT for peer studies and those who did not. 144 (51.2%) stated positive and 137 (48.8%) stated negative. There were less users of online study groups among the participants. For the online study group, 34 (24.8%) were from KNUST, 30 (21.9%) from UCC, 31 (22.6%) from UEW and 42 (30.7%) from UG.

**Table 5: Effectiveness of Online learning Community**

| | KNUST | UCC | UEW | UG | Total |
|---|---|---|---|---|---|
| Very Effective | 4(50.0%) | 0(0.0%) | 3(37.5%) | 1(12.5%) | 8(4.7%) |
| Quite Effective | 17(27.9%) | 13(21.3%) | 12(19.7%) | 19(31.1%) | 61(35.9%) |
| Effective | 15(31.9%) | 12(25.5%) | 8(17.0%) | 12(25.5%) | 47(27.4%) |
| Not Effective | 1(4.8%) | 3(14.3%) | 6(28.6%) | 11(52.4%) | 21(12.4%) |
| Not Sure | 3(9.1%) | 0(0.0%) | 16(48.5%) | 14(42.4%) | 33(19.4%) |
| **Total** | **40(23.5%)** | **28(16.5%)** | **45(26.5%)** | **57(33.5%)** | **170 (100%)** |

The usefulness of the study group by participants is shown in **Table 5**. 8(4.7%) of the participants stated that the study group very effective, 61(35.9%) stated quite effective, 47(27.4%) stated effective, 21(12.4%) stated not effective, and 33(19.4%) stated not sure. Majority of participants 116 (68.2%) stated some level of usefulness and 54 (31.8%) did not find it beneficial. Also, for study group users 36 (31.0%) were in KNUST, 25 (21.6%) in UCC, 23 (19.8%) in UEW, and 32 (27.6%) from UG.

## Students' Online Resource Usage Categories

This session investigated the categories of participants' using online resources which include email, social network and search engines. Downloads, online music, online games, online videos, online shopping and News.

**Table 6: Internet Usage for research purposes by Institutions**

| | KNUST | UCC | UEW | UG | Total |
|---|---|---|---|---|---|
| Every time | 25(35.2%) | 5(7.0%) | 18(25.4%) | 23(32.4%) | 71(25.7%) |
| Most Times | 38(31.1%) | 22(18.0%) | 24(19.7%) | 38(31.1%) | 122(44.2%) |
| Some times | 7(10.3%) | 23(33.8%) | 25(36.8%) | 13(19.1%) | 68(24.7%) |
| Never | 2(16.7%) | 9(75.0%) | 1(8.3%) | 0(0.0%) | 12(4.3%) |
| Don't know | 1(33.3%) | 0(0.0%) | 1(33.3%) | 1(33.3%) | 3(1.1%) |
| **Total** | **73(26.4%)** | **59(21.4%)** | **69(25.5%)** | **75(27.2%)** | **276(100.0%)** |

The frequency of internet usage for research purposes by the DE institution is shown in **Table 6**. 71(25.7%) used the internet every time, 122(44.2%) used the internet most times, 68(24.7%) used the internet occasionally, 12(4.3%) never used the internet and 3(1.1%) were not sure of internet use. 261 (94.6%) used the internet for research purpose while 15 (5.4%) did not. Institutionally, 70 (95.9%) were KNUST students, 50 (84.7%) were from UCC, 67 (97.1%) were UEW students and 74 (98.7%) were from UG.

**Table 7: Internet Usage for checking mail by Institutions**

| | KNUST | UCC | UEW | UG | Total |
|---|---|---|---|---|---|
| Every time | 36(41.9%) | 12(14.0%) | 22(25.6%) | 16(18.6%) | 86(31.2%) |
| Most Times | 26(27.1%) | 25(26.0%) | 16(16.7%) | 29(30.2%) | 96(34.8%) |
| Some times | 10(11.6%) | 21(24.4%) | 25(29.1%) | 30 (34.9%) | 86(31.2%) |
| Never | 0(0.0%) | 1(20.0%) | 3(60.0%) | 1(20.0%) | 5(1.8%) |
| Don't know | 1(33.3%) | 0(0.0%) | 1(33.3%) | 1(33.3%) | 3(1.0%) |
| **Total** | **72(26.1%)** | **59(21.4%)** | **67(24.3%)** | **78(28.3%)** | **276 (100.0%)** |

**Table 7** shows the frequency of using the internet to check e-mail. 86(31.2%) participants checked their emails every time, 96 (34.8%) checked their emails most times, 86(31.2%) checked their e-mail sometimes, 5(1.8%) never checked their mails and 3(1.0%) did not know. 268 (97.1%) participants checked emails and 8(2.9%) never or did not know email. Institutionally, participants who checked emails were 71 (26.5%) from KNUST, 58 (21.6%) were from UCC, 63 (23.5%) were from UEW, 76 (28.4%) were from UG.

**Table 8: Internet Usage for Search Engines by Institutions**

| | KNUST | UCC | UEW | UG | Total |
|---|---|---|---|---|---|
| Every time | 20(28.6%) | 13(18.6%) | 17(24.3%) | 20(28.6%) | 70(25.6%) |
| Most Times | 24(30.0%) | 12(15.0%) | 18(22.5%) | 26(32.5%) | 80(29.3%) |
| Some times | 18(31.3%) | 20(29.0%) | 14(20.3%) | 17 (24.6%) | 69(25.3%) |
| Never | 4(10.8%) | 7(18.9%) | 14(37.8%) | 12(32.4%) | 37(13.6%) |
| Don't know | 4(23.5%) | 4(23.5%) | 6(35.3%) | 3(17.6%) | 17(6.2%) |
| **Total** | **70(26.5%)** | **59(20.5%)** | **69(25.3%)** | **78(28.6%)** | **273(100.0%)** |

**Table 8** shows the frequency of using search engines. 70(25.6%) used search engines every time, 80(29.3%) used them most times, 69(25.3%) used them sometimes, 37(13.6%) never used them, and 17(6.2%) did not know of them. 216 (80.2%) were search engine users and 57 (19.8%) were not search engine users. Institutionally, 62 (28.7%), 45 (20.8%), 49 (22.9) and 63 (29.2%) were from KNUST, UCC, UEW, and UG respectively.

**Table 9: Internet Usage for social networks by Institutions**

| | KNUST | UCC | UEW | UG | Total |
|---|---|---|---|---|---|
| Every time | 28(23.7%) | 25(21.2%) | 25(21.2%) | 40(33.9%) | 118(42.9%) |
| Most Times | 20(24.7%) | 21(25.9%) | 21(25.9%) | 19(23.5%) | 81(29.5%) |
| Some times | 22(37.3%) | 10(16.9%) | 15(25.4%) | 12(20.3%) | 59(21.5%) |
| Never | 2(20.0%) | 1(10.0%) | 5(50.0%) | 2(20.0%) | 10(3.6%) |
| Don't know | 1(14.3%) | 1(14.3%) | 1(14.3%) | 4(57.1%) | 7(2.5%) |
| **Total** | **73(26.5%)** | **58(20.5%)** | **67(25.3%)** | **77(28.6%)** | **275(100.0%)** |

Frequency of social networks usage is in **Table 9**. The participants used social media 118 (42.9%) every time, 81(29.5%) most times, and 59(21.5%) sometimes. Also 10(3.6%) never used them and 7(2.5%) did not know them. Social media users were 258 (93.8%) and non-social media users were 17 (6.2%). For the social media users, 70 (27.1%) were from KNUST, 56 (21.7%) from UCC, 61 (23.6%) from UEW and 71 (27.5%) from UG.

**Table 10: Internet Usage for Ecommerce by Institutions**

| | KNUST | UCC | UEW | UG | |
|---|---|---|---|---|---|
| Every time | 4(18.2%) | 9(40.9%) | 2(9.1%) | 7(31.8%) | 22(8.1%) |
| Most Times | 2(9.1%) | 6(27.3%) | 9(40.9%) | 5(22.7%) | 22(8.1%) |
| Some times | 15(36.6%) | 7(17.1%) | 9(22.0%) | 10(24.4%) | 41(15.0%) |
| Never | 47(28.3%) | 34(20.5%) | 40(24.1%) | 45(27.1%) | 166(60.8%) |
| Don't know | 4(18.2%) | 4(18.2%) | 7(31.8&) | 7(31.8%) | 22(8.1%) |
| **Total** | **72(26.4%)** | **60(22.0%)** | **67(24.5%)** | **74(27.1%)** | **273(100.0%)** |

Patronage of ecommerce by participants is shown by **Table 10**. 22(8.1%) used ecommerce sites every time, 22(8.1%) used them most times, 41(15.0%) used them occasionally, and 22(8.1%) were not aware of them. Generally, 85 (31.1%) buy and sell items online whiles 188(68.9%) did not indicating low ecommerce patronage. For ecommerce users, 21 (24.7%) were from KNUST, 22 (25.9%) from UCC, 20 (23.5%) from UEW and 22 (25.9%) from UG.

**Hypothesis 1**

**$H_0$**: There is no statistical difference in the internet expenditure of distance education students

**Table 11: Chi-Square Tests**

| | **Value** | **df** | **Asymp. Sig. (2-sided)** |
|---|---|---|---|
| Pearson Chi-Square | 18.252[a] | 12 | .108 |
| Likelihood Ratio | 19.718 | 12 | .073 |
| Linear-by-Linear Association | 3.174 | 1 | .075 |
| N of Valid Cases | 257 | | |

*a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is .70.*

The cost of internet is on ascendancy due to the popularity of smart phones with myriad of social media. It was observed from **Table 11** that majority of participants in institutions spent less than 31 cedis on data per week. Averagely, DE students spend 40 cedis monthly for their internet use. The Pearson chi square ($\chi^2$ [12, 257]) = 18.257, $p > .05$ implied that there is no statistical difference among the DE students' funds for internet from the different institutions. Hypothesis 1 therefore not rejected.

**Hypothesis 2**

**$H_1$**: Students confidence in using computer to learn do not correlate to with internet usage history

**Table 12: Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 28.571[a] | 12 | .005 |
| Likelihood Ratio | 29.029 | 12 | .004 |
| Linear-by-Linear Association | 12.653 | 1 | .000 |
| N of Valid Cases | 274 | | |

*7 cells (35.0%) have expected count less than 5. The minimum expected count is .32.*

From **Tables 12**, it is acceptable to predict that the DE students who have had a minimum of two years computer experience would embrace an educationally integrated learning environment with Pearson Chi-Square ($\chi^2$ [12, 274]) = 28.571. The $p < .05$ implies the result is statistically significant. We therefore reject the null hypothesis. The UCC and UEW can confidently implement LMS for their distance education sectors to minimize bottle necks and utilise the huge advantages these software suits offers

**Hypothesis 3**

$H_2$: There is no statistical difference in the online usage categories of distance education institutions

**Table 13: One-Way ANOVA**

| | df | F | Sig. |
|---|---|---|---|
| Mostly Internet Uses For Email | 3 | .224 | .880 |
| Mostly Internet Uses For Research | 3 | 5.251 | .002 |
| Mostly Internet Uses For Social networks (e.g. Facebook) | 3 | 1.364 | .254 |
| Mostly Internet Uses For Downloads | 3 | 12.052 | .000 |
| Mostly Internet Uses For Online music | 3 | .187 | .905 |
| Mostly Internet Uses For Online games | 3 | 2.853 | .038 |
| Mostly Internet Uses For Online videos (e.g. YouTube) | 3 | 5.763 | .001 |
| Mostly Internet Uses For Online shopping | 3 | .753 | .521 |
| Mostly Internet Uses For News | 3 | 1.914 | .127 |
| **Mostly Internet Usage (Cumulative)** | **3** | **3.465** | **.017** |

**Table13** shows the One-Way ANOVA of the online usage categories of distance education institutions. The sum total of the internet usage of all online categories was F [3, 297] = 3.47, with a p-value of .017, indicating a statistically significant difference among participants from the four universities. Hypothesis 3 is therefore rejected. DE students who mostly used the internet for research was F [3, 297] = 5.25, p =.002; downloads was F [3, 297] = 12.05, p = .000; online gaming was F [3, 297] = 2.85, p = .038; and online videos was F [3, 297] = 5.76, p = .001, were statistically significant. These online usage categories did not support the hypothesis 3. However, there was no statistically difference between the DE participants in terms of using email was F [3, 297] = 0.22, p =.880; social network was F [3, 297] = 1.36, p = .254; online music was F [3, 297] = 0.187, p = .905, online shopping was F [3, 297] = 0.75, p = .521; and online news was F [3, 297] = 1.91, p = .127. The hypothesis 3 would not be rejected based on these categories. For homogeneous subgroups, all participants were similar in email, online music, and online news usage according to Tukey $^{HSD}$ post hoc test in **Table 14**. Post hoc test for research also showed that UEW and KNUST in one subgroup with UG and UCC in the other subgroup. For downloads, participants from UEW and KNUST were similar, KNUST and UG were also similar with UG and UCC in a third group. Finally, for online video usage, UEW, KNUST and UG were similar with UG and UCC also in another group.

**Table 14: Tukey $^{HSD}$ Homogeneity Test**

| | E-mail | Research | | Download | | | E-music | Online video | | E-Shop | News |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1 | 2 | 1 | 2 | 3 | 1 | 1 | 2 | 1 | 1 |
| UEW | .49 | .58 | | .20 | | | .08 | .03 | | .03 | .04 |
| KNUST | .53 | .60 | | .29 | .29 | | .11 | .10 | | .05 | .13 |
| UG | .53 | | .79 | | .48 | .48 | .12 | .17 | .17 | .08 | .14 |
| UCC | .56 | | .80 | | | .62 | .12 | | .25 | .08 | .15 |

## Discussion

### Research question 1

**What is the computer information literacy of the distance education students?**

The study revealed that 82.0% of the DE students had more than 3 year's internet experience. Loan (2011) found internet illiteracy as the major limitation in using the internet. Akande (2011) reported 49.0% computer literacy among sandwich students. Although this high percentage does not necessarily suggests DE student's acceptance and seamless interaction with LMS, it serves as good indicator introducing online programs by institutions. The study agrees with that of Edumadze, et al. (2017) who reported 92.5% internet access and 53.6% internet skills. The study also found that 73% of the students have more than three internet access options with smart phones being the dominant access device. The awareness of e-learning awareness was also found to be high (87.1%) but majority of the students (53.9%) were neither unaware nor sure of their institutions deploying such services. This observation was further confirmed by 74.2% of students' unaware of LMS. This low information literacy among university students was in conformity with findings of Aralu and Adetimirin (2014), Gui (2007), Ouma and Nkuyubwatsi (2019), and Musingafi, et al. (2015)

**Research question 2**

**What is the effectiveness of distance education student's online community?**

Collaborative online learning among DE student of Ghana was largely average (48.8%). Although class WhatsApp social network groups were available, they were mainly for social and informational purposes. However, students with small online study groups indicated 68% effectiveness. Several factors such as unfocused or off-track discussions, lack of encouragement from leader, technical difficulties, time and work constraints could account for this phenomenon (Dennen, 2000; Precce, et al., 2004).

**Research question 3**

**What is the online resource usage categories of distance education students?**

Majority of the distance learners involved in the study were active internet users. The internet users were 211(75.1%) compared the non-internet users were 70 (24.9%) when the cumulative frequency of usage of some online resources (i.e. email, research, Wikipedia, search

engines, ecommerce, social media) were analysed. This finding 94.6% DE students frequently used the internet research; 97.2% DE students frequently checked their email; 70.2% DE students frequently used Wikipedia; 80.2% DE students regularly used search engines; 93.9% DE students frequently social media; and conversely, only 31.2% DE students used ecommerce. This findings agreed with that of Ojokoh and Asaolu (2005) and Anasi (2006) who noted high internet facilities usage among undergraduate students.

The differences in the expenditure on internet data among the different institutions prompts several reasons such as differences in online instructional durations, internet devices, work and family obligations and level of computer literacy. Furthermore, the study could not establish a correlation between students' confidence in using computer to learn and internet history. According to Jumia Annual Mobile Report (2018) there is a high smartphones penetration of 119% with about 35.57 million subscribers in Ghana. Many students can't browse the internet but are completely illiterate about using computer applications. With the rapidity of versioning of both software and hardware in the computer industry, old knowledge does not imply new skills due to evolution of new gadgets. Finally the diversity in frequency of online usage categories could be attributed to divers work, academic and social demands as well as personal preferences.

## Limitations

Several limitations of this study should be noted. First, the results of this study were mainly derived from four universities undergraduates in Ghana.

Also, only two learning centres were chosen from each of the University for Data Collection. Finally, only students' views were captured in this study without considering that of the administrators and their instructors.

## Conclusion

The future demand distance education in Ghana is far from its peak level. The huge senior high school students who fail to gain admission into the regular enrolment virtually opt for distance options coupled with workers furthering their education without quitting jobs. A solid foundation in computer literacy at the preceding educational level is critical to seamless integration in online learning. Effective online learning communities in necessary for students' inclusiveness and discussion of reading assignment purposes. Funding of digital equipment and internet cost needs to be addressed to prevent widening the digital divide among students. Finally, distance students' online resource usage categories need to be enhanced.

## Recommendations

Distance Education continues to be the preferred option form students with work and other demanding obligations. Statistics on enrolment trends shows increasing growth in distance learning with universities investing more funds on global scale in order to gain competitive advantage. National policies and supervision need to be reviewed to enhance the quality of distance education in Ghana. The National Accreditation Board (NAB) needs a national information technology platform to streamline, standardize courses/programs and integration of distance education colleges/faculties of universities.

Computer literacy forms a solid background for eLearning. The low computer literacy of distance learners is indicative of the quality of the Information and Communication Technology (ICT) subject at the Senior High Schools (SHSs) A comprehensive review of the course content, provision of robust and easily accessible IT infrastructure in all SHSs and adequately trained technical staff needs consideration from the Ministry of Education (MOE). The increasing digital divide due to lack of funding for internet data need to be addressed through allocation of either free or highly subsidized. MOE can initiate DE institutions and telecommunication companies' cooperation to provide free or low-cost data for distance education.

Finally, more online learning communities need to be encouraged among DE students with guided support form lectures to make them very effective for academic purposes.

## Recommendations for Future Research

Future studies could investigate the perception of distance education students on the quality of support services and general administration provided by their respective universities.

Furthermore, the relationship between student persistence and family support needs to be investigated.

Also, the effects of employers' support on distance education students their academic performance can also be investigated.

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# Effectiveness of Video Instructional Techniques (VIT) On Learning Outcomes of Vulnerable Learners in Junior Secondary Schools

# L'efficacité des Techniques des Vidéo Pédagogiques (VIT) sur les Résultats d'Apprentissage des Apprenants Vulnérables dans les Ecoles Secondaires du Premier Cycle Collège

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## Abstract
This study examined the impact of video instructional techniques on enhancing the learning outcomes of vulnerable learners in secondary *schools. In the context of evolving teaching methods and the imperative to address diverse learning needs, the study explored the effectiveness of instructional videos compared to traditional face-to-face instruction. A quasi-experimental design was employed, involving pre-test and post-test measures for both experimental and control groups. The findings revealed that instructional videos significantly improved the learning outcomes of vulnerable learners. Additionally, the study highlighted the positive influence of instructional videos on learners' retention abilities. This research contributes to the discourse on innovative teaching strategies, particularly their efficacy in catering to diverse student needs and enhancing educational outcomes.*

***Keywords***: video instructional techniques, vulnerable learners, innovative teaching, learning outcomes

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**Résumé**
*Cette étude a examiné l'impact des techniques pédagogiques par vidéo sur l'amélioration des résultats d'apprentissage des apprenants vulnérables dans les écoles secondaires. Dans le contexte de l'évolution des méthodes d'enseignement et de l'impératif de répondre aux besoins d'apprentissage divers, l'étude a exploré l'efficacité des vidéos pédagogiques par rapport à l'enseignement traditionnel en face-à-face Un modèle quasi-expérimental a été utilisé, impliquant des mesures de pré-test et de post-test pour les groupes expérimentaux et les groupes de contrôle. Les résultats ont révélé que les vidéos pédagogiques amélioraient de manière significative les résultats d'apprentissage des apprenants vulnérables. De plus, l'étude a mis en évidence l'influence positive des vidéos pédagogiques sur les capacités de rétention des apprenants. Cette recherche contribue au débat sur les stratégies d'enseignement innovantes, en particulier leur efficacité pour répondre aux divers besoins des étudiants et améliorer les résultats éducatifs.*

***Mots-clés*** **:** Techniques pédagogiques par vidéo, apprenants vulnérables, enseignement innovant, résultats d'apprentissage

## Introduction

Education serves as the gateway to knowledge and skill acquisition, facilitating structured interactions between educators and learners. In our rapidly evolving world, the shift from traditional teaching methods to a learner-centric approach has become a necessity to meet the contemporary skill demands of the 21st century (Holbrey, 2020; Hafee, 2021). This transition places a profound emphasis on educators' possession of innovative teaching skills that actively engage learners in the educational process. Therefore, the quality of teaching and learning is intrinsically linked to the competence of educators, as measured by their theoretical and practical knowledge, as well as their pedagogical abilities in incorporating novel and emerging information. Traditionally, teaching methods were often lecture-driven, minimally participatory, and primarily teacher-centred, casting educators as the primary authorities while relegating learners to passive roles (De Kok, Divaris & Samuelson, 2017). The conventional 'chalk and talk' pedagogy, which has prevailed for centuries, proves inadequate in

meeting the contemporary requirements of modern-day secondary education (De-Kok & Samuelson, 2017). While this approach may be advantageous for transferring fundamental knowledge to large groups, studies have revealed its limitations in fostering critical thinking and teaching-learning skills essential for today's education.

Modern education demands innovative pedagogical approaches that cater to diverse students' needs. However, despite the welcoming reception of technological innovations, several educational institutions still adhere to a standardized teaching approach (Beas, 2019). This one-size-fits-all methodology poses challenges for learners who struggle with rigid and fast-paced learning environments, often characterized as "vulnerable children" (Rosyidah, 2016). These individuals, frequently labeled as "slow learners," exhibit comparatively delayed cognitive development compared to their peers, prompting the need for educational reform to bridge this gap.

As described by Beas (2019), vulnerable learners are those who acquire academic skills at a rate lower than the average student, necessitating additional time, repetition, and instructional resources for success. Common characteristics of these learners encompass limited cognitive capacity, reduced intelligence quotient (IQ), information processing deficits, short-term memory deficiencies, concentration issues, and challenges in abstract thinking and expressing ideas (Makhamova & Ergashev, 2022). Vulnerable learners often populate regular classrooms, and addressing their unique needs is crucial to prevent potential dropouts. A proficient teacher recognizes classroom behaviors associated with learning difficulties, and the extent of vulnerability can often be indicated by an IQ score ranging from 70 to 90 (Cooter & Robert, 2019).

To address the distinct needs of vulnerable learners effectively, an innovative approach that leverages educational technology is imperative. Educational technology, often referred to as EdTech, involves the integration of technology and digital tools in educational settings to enhance teaching and learning processes (Roblyer, 2016). Its core purpose is to provide innovative solutions that improve pedagogy, facilitate personalized learning, and adapt to the changing

educational landscape (Bower, 2016). Technology-driven educational advancements have transformed the learning process for vulnerable learners, and their diverse behaviours necessitate a range of teaching methodologies. However, these characteristics shouldn't deter them from embracing modern educational technology. By exposing vulnerable learners to new technology and its potential benefits, educators can effectively bridge the learning gap.

In the context of evolving instructional paradigms, a shift from traditional methods to video-based instruction is becoming increasingly prominent. Instructional videos, dynamic and interactive, offer a versatile alternative to traditional teaching materials (Sablic et al., 2020). They have gained significant attention and widespread adoption in various educational settings due to their potential to enhance learning experiences and improve educational outcomes (Allen, Gu, & Michel, 2016). Recorded video instruction allows students to access educational content at their own pace and convenience, catering to diverse learning styles and preferences. It enables learners to revisit and review the material as needed, enhancing comprehension and engagement (Brame, 2016; Mayer, 2014).

Furthermore, the interactivity of recorded video instruction, through features like quizzes, discussion forums, and feedback mechanisms, can be harnessed to engage learners actively, providing instructors with insights into students' progress and comprehension (Jham, 2019). While recorded video instruction is commonly associated with traditional academic settings, it also serves as a valuable resource in professional development and skills training, making it accessible for upskilling and on-the-job learning (Davies, Howell, & Petrides, 2010). The integration of instructional videos into teaching methodologies, such as the flipped classroom approach, holds significant potential to boost learning outcomes (Roe, Rowe, Odegaard, Syllias, & Dahl-Micheisen, 2019). Numerous studies have emphasised the efficacy of instructional videos in enhancing learning skills and outcomes (El-senousy & Alquda, 2017; Uzunboylu et al., 2017).

The COVID-19 pandemic has given prominence to distance learning, predominantly in employing recorded video instruction in teaching and

learning (Surono et al., 2020; Ekoindrajit & Wabawa, 2020; Kardpah and Wabawa, 2020; Chaeruman et al., 2018). Technology integration in education advocates multimedia content for active learning, including dynamic videos and animations. These instructional tools capitalise on the power of visual and auditory cues for effective learning (Gold & Holodynski, 2017). However, while recorded video instruction offers numerous benefits, it is not without its challenges.

One significant challenge lies in ensuring that all students, regardless of their circumstances, have equitable access to video content. In an era where the digital divide still persists, it's vital to consider the availability of necessary technology and internet access. Educational institutions must adopt strategies to bridge this gap, such as providing students with the required devices or facilitating access to high-speed internet. Additionally, effective use of recorded video instruction requires instructors to possess the knowledge and skills to create engaging and pedagogically sound content. While technology proficiency is increasingly becoming a requisite skill for educators, comprehensive training and support are essential. Professional development programs should empower instructors with the competencies needed to produce high-quality video materials. This includes not only technical skills but also an understanding of best practices for instructional design and effective communication through video.

Moreover, copyright considerations must be taken into account when using third-party materials (Jung, 2018; Vaughan, 2014). The integration of recorded video instruction in education brings forth a myriad of possibilities and challenges.

This study therefore examined the effectiveness of VIT on the learning outcomes of vulnerable learners, Specifically, the study sought to:

- examine the effectiveness of video instruction in teaching vulnerable learners (slow learners).
- Determine the retentive ability of vulnerable learners after the use of instructional videos.

## Hypotheses

The following hypotheses were tested at 0.05 level of significance

**1** There is no significant difference in the learning outcomes of vulnerable learners taught using video instructional technique and the group taught with the conventional teaching method.

**2** There is no significant difference in the retentive ability of vulnerable learners taught using video instructional technique and those taught using conventional method

## Research Methodology

This study employs a quasi-experimental design, specifically utilising a pre-test, non-equivalent, control group design. The choice of this design is driven by the practical constraints and ethical considerations inherent in an educational research context, where random assignment of students to different groups may not always be feasible or ethical.

The population of the study consists of vulnerable learners in the selected classrooms. Vulnerable learners are identified based on the assessment report card and teachers' assessments over the course of one year. This selection process ensures that the study focuses on students with similar levels of vulnerability within each group. To draw the sample, a multi-stage sampling procedure was utilised. The selection of the intact classrooms and experimental groups was carried out through a purposive sampling technique. This method was selected to ensure that the sample is homogenous in terms of relevant student characteristics. The sample comprises two intact classrooms from junior secondary schools, one serving as the experimental group (Group A) and the other as the control group (Group B).

The study utilises the Basic Science Achievement Test as both the pre-test and post-test instrument. This test comprises 50 multiple-choice items, with each correct answer worth two points. The choice of this instrument is made based on its relevance to the research objectives, and its reliability and validity are established to ensure the accuracy of assessment.

The instructors responsible for the experimental group (the class teacher) receive specific training on how to effectively use video-taped instructional strategies. This training spans two days and equips the teachers with the necessary skills to implement video instruction such audio recording styles, voice control, connections method and projecting. In contrast, the control group teacher follows the traditional teaching method with prepared lesson notes.

Prior to commencing the experiment, a pre-test was administered to both the experimental and control groups to establish a baseline for their knowledge. The intervention, which involves video instruction, is implemented over a span of three weeks. During this instructional period, a specific topic, "States of Matter," was taught. This topic was further divided into three subtopics, covering solids, liquids, and gases. Each subtopic was taught in a week. The pre-test is thoughtfully designed to encompass the content taught during the three-week instructional period, ensuring that it appropriately reflects the knowledge and skills addressed in the experiment. Following the three-week intervention period, the same pre-test is re-administered as the post-test. This post-test is essential for assessing the impact of the intervention on the learners' understanding of the subject matter. Additionally, a retention test is conducted two weeks after the post-test using the Basic Science Achievement Test. This test serves to evaluate the learners' ability to retain and apply the knowledge gained from the intervention over an extended period.

By organising the procedure in this manner, the flow and logical sequence of the experiment are maintained, allowing for a clear understanding of the process. The study adheres to ethical principles, including informed consent from participants and considerations for the confidentiality of their information

Data collected from the pre-test, post-test, and retention test are subjected to rigorous data analysis.

## Result of findings

**Table 1.** Comparison of the mean scores of the experimental group and control group.

| Groups | N | Mean | Standard Deviation | Std Error Mean |
|---|---|---|---|---|
| **All control posttest (Using face-to-face teaching)** | 10 | 24.4 | 9.74 | 3.10 |
| **All experimental posttest (Using instructional video)** | 10 | 41.6 | 12.5 | 3.9 |

Table 1. The experimental group taught using video instruction had a higher mean score (X = 41.6±12.5), then the control group taught using traditional method (X = 24.4 ± 9.74), which revealed statistically significant difference, From the pre-test, it is known that the mean post-test value of the experimental class using video was 41.6, classified as good with a standard deviation of 12.5 and a standard error of 3.9. While for the mean posttest value of the control class with traditional face-to-face learning, the value was 24.4, classified as poor with a standard deviation of 9.74 and a standard error of 3.10. The mean value of the experimental class was higher than the control class.

## Mean pretest, Mean Post-test, and Mean Gain Scores

The mean gain score of students in the experimental group was higher than in the control group. This result suggests that there was a greater increase in the level of knowledge in Basic science of the students exposed to the instructional video than those exposed to the traditional method. When control and experimental groups were compared, results show that the posttest scores of experimental groups have standard deviation values greater than that of the control group. This indicates that the scores posted by the students in the control group were more homogenous than those of the students in the control group

**Table 2.** Pretest, posttest, mean gain scores of students in the control and experimental groups

| **Variable** | **Control** | | **Experimental** | |
|---|---|---|---|---|
| | Mean | Std. | Mean | Std. |
| **Pretest Score** | 16.4 | 7.04 | 18.2 | 6.07 |
| **Posttest Score** | 24.4 | 9.74 | 41.6 | 12.5 |
| **Mean Gain Score** | 1.01 | 0.03 | 2.91 | 0.07 |

**Mean Difference between the Mean Pretest and Posttest Scores**

Comparing the mean scores of pre-tests and posttest in basic science in both groups, paired samples t-test result revealed a p-value less than 0.05. This indicates that there was a significant difference between the mean pretest and posttest scores in basic science test of students exposed to instructional video technique.

**Table 3. Paired samples t-test on the mean pretest and posttest scores of students in the control and experimental groups**

| GROUP | t-value | D.f | p-value |
|---|---|---|---|
| Control | -2.35 | 9 | 0.04331 |
| Experimental | -2.7 | 9 | 0.02562 |

*Significant at $p<0.05$

The p-value associated with t-value -2.7 and degree of freedom n-1=9 is p-value =0.02562.the result is significant at $p<0.05$ hence, the hypothesis one is not accepted. This indicates that there was a significant difference between the mean pretest and posttest scores in basic science test of students exposed to instructional video technique There is no significant relationship between the posttest and retention scores in the experimental group.

To determine whether there were significant differences in the retention mean scores of groups with instructional video and those exposed to traditional teaching method, data were analysed using the paired t-test as shown in table 3 and 4

**Table 4.** The comparison of the posttest and retention test scores in experimental group

| Test | N | Mean | Std | D f | t-value | p-value |
|---|---|---|---|---|---|---|
| Posttest | 10 | 41.6 | 12.5 | 9 | 1.79 | 0.10707 |
| Retention | 10 | 40.2 | 12.14 | 9 | | |

**Table 5.** The comparison of the posttest and retention test scores in control group

| Test | N | Mean | Std. | D.f | t-value | p-value |
|---|---|---|---|---|---|---|
| Posttest | 10 | 24.4 | 9.74 | 9 | 2.40 | |
| Retention | 10 | 18.4 | 6.98 | 9 | 0.03990 | |

*Significant at $p<0.05$

When compared table 5.and 6, there was a significant difference between the scores of posttests on retention tests of both experimental and control group ($p<0.05$). Retention test scores of the both group is lower than the posttest scores. But the differences are lower in control group. While the decrease between the posttest and retention test scores of experimental groups is 1.40, the decrease between the posttest and retention test scores of the control group is 6.00.

**Summary of Findings**

A pronounced disparity in performance between the experimental group, exposed to instructional videos, and the control group, who underwent traditional instruction. The results unequivocally indicate that the utilisation of instructional videos yields a substantial and positive impact on the learning outcomes of vulnerable learners when compared to conventional teaching methods. This underscores the significance of incorporating technology-enhanced instruction to enhance the educational experience of this demographic.

Additionally, the study's findings shed light on another critical dimension. They underscore the instructional video's potent effect on the retentive capacity of vulnerable learners. This means that the use of instructional videos not only improves immediate learning outcomes but also enhances the learners' ability to retain and recall the acquired knowledge over time. This finding further bolsters the argument for the

integration of instructional videos in educational settings, particularly for addressing the distinctive needs of vulnerable learners.

In summation, the results of this study offer compelling evidence in favour of instructional videos as an effective and valuable tool in the realm of education, particularly for empowering vulnerable learners and augmenting their learning outcomes and retention capabilities. These findings hold substantial implications for educational practitioners, policymakers, and stakeholders who are dedicated to ensuring inclusive and effective educational practices for all students.

## Discussion of the Findings

The first major finding of the study highlights a substantial improvement in the performance of pupils in the experimental group compared to those in the control group subjected to traditional face-to-face teaching methods. This result underscores the effectiveness of instructional videos in enhancing the learning outcomes of vulnerable learners. Educational research has consistently shown that instructional videos offer several advantages over traditional teaching approaches. For instance, in a study by Mayer (2003), it was found that well-designed instructional videos can improve learning outcomes by leveraging multimedia principles, such as the combination of visual and auditory information. Hegeman (2015), also found some evidence that the usage of video-based learning witnessed improvements in teaching techniques and learning outcomes in a survey of peer-reviewed qualitative and quantitative publications ranging from 2003 to 2013 that were sourced from 7 major databases and 21 academic journals. According to Bong (2003), access to digital devices has been identified as a critical factor in enhancing learning eta

Additionally, cognitive load theory, as explained by Sweller et al. (1998), emphasises the importance of minimising extraneous cognitive load to enhance learning. Traditional teaching methods often involve the simultaneous processing of verbal information and complex visual aids on chalkboards or whiteboards, potentially overloading the cognitive capacity of vulnerable learners. Instructional videos, on the other hand, can be carefully designed to reduce cognitive load by

presenting information sequentially and at a manageable pace. This reduction in cognitive load may have contributed to the improved learning outcomes observed in the experimental group. This finding further collaborated with research outcome of Ogundaini, (2023), Ihuoma & Akande (2020) both asserted that students with access to digital instructions performed well.

The second key finding of the study pertains to the significant effect of instructional videos on the retentive ability of vulnerable learners. This finding highlights the lasting impact of using video-based instruction on students' ability to recall and retain information over time. The concept of retention and memory enhancement through multimedia learning aligns with the principles of cognitive psychology. One explanation for this effect is the dual-coding theory mentioned earlier (Paivio, 1971). When instructional videos present information both visually and auditorily, it provides learners with multiple memory pathways for encoding and retrieval. Also, Ohler (2020) claimed that the utilisation of multimedia instructional technology brings clarity and create recognition that allow students to grasp the content of the subject.

Furthermore, research by Mayer and Moreno (2003) emphasises the importance of managing cognitive load to optimise learning and retention. They propose that multimedia presentations, such as instructional videos, should carefully manage the cognitive demands placed on learners. By reducing extraneous cognitive load and focusing learners' attention on essential information, instructional videos can facilitate better encoding and retention of knowledge. Furthermore, Taslibeyaz (2017) asserts that watching videos was beneficial in the context of medical education, which primarily used case studies. The use of instructional videos is effective and leads to more learning in less time and ensures that the students retain what is learned.

Overall, the findings provide compelling evidence for the efficacy of instructional videos in improving the learning outcomes and retention abilities of vulnerable learners. The discussion has drawn upon established educational psychology theories and empirical research to support and contextualise the findings. These outcomes have practical

implications for educators and instructional designers, emphasising the value of incorporating well-designed instructional videos into pedagogical practices, especially when teaching vulnerable learners. By leveraging multimedia principles and managing cognitive load, instructional videos can play a pivotal role in enhancing both the immediate and long-term educational experiences of these learners.

## Conclusion

The study underscores a significant advantage in favor of video instruction over conventional teaching methods in terms of students' learning outcomes and engagement. This finding aligns with a growing body of research highlighting the benefits of multimedia-enhanced learning environments. the use of video instruction positively impacted students' learning outcomes. This outcome is consistent with numerous studies that have demonstrated the effectiveness of multimedia in education. The study highlights the potential benefits of incorporating video instruction into pedagogical practices to enhance students' learning experiences. This approach can be particularly valuable when aiming to capture and maintain students' attention, especially in contemporary digital age, where students are accustomed to multimedia-rich content.

Additionally, it suggests that educators should explore opportunities to create more interactive video content that encourages students to actively engage with the material. Incorporating quizzes, discussions, or problem-solving scenarios within instructional videos can promote deeper understanding and critical thinking.

## Recommendations

In line with the findings of the study, the following recommendations were made:
Teachers should be encouraged to adopt video instructions as an innovative strategy to improve the academic performance of vulnerable learners. This is a proactive step toward addressing the unique learning needs of their students.

Training of teachers on how to handle vulnerable learners and make learning more accessible to them should be organised. Vulnerable learners may have diverse needs, including those related to special education or socioeconomic challenges. Teaching Service Commissions can play a pivotal role in organising training sessions that focus on inclusive teaching strategies, classroom management techniques, and the use of technology, such as video instructions, to cater to these students' needs.

Additionally, it might be beneficial to consider policy-level changes that support the implementation of these recommendations. Educational authorities can develop policies that promote the use of instructional videos in classrooms, allocate resources for professional development initiatives, and prioritise inclusive education practices

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# Assuring Quality Teacher Education: Preparing Science Teachers for Blended Classrooms

# Assurer la Qualité de l'Education des Enseignants : Préparer les Enseignants de Sciences pour les Salles de Classe Hybrides

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## Abstract
*The advent of Information and Communication Technology and the continued acceptance and advancement of online learning following the COVID-19 pandemic has placed demands for unique competencies and skills on teachers if they are to succeed in their career. This study investigated the extent to which science teacher preparation programmes in South-East Nigeria incorporate Blended Learning. Two hundred and ten (210) pre-service science teachers and Thirty-two (32) science teacher educators in three federal government-owned universities in South-East Nigeria made up the sample for the study. The instrument for data collection, which had different versions for teacher educators and pre-service science teachers, and Cronbach Alpha reliability coefficient of 0.86 and 0.81 respectively, was a 21-item researcher-developed instrument titled Blended Learning in Science Teacher Preparation Questionnaire (BLiSTPQ). Three research questions and two hypotheses guided the study. Results indicated that blended learning is not generally adopted in pre-service science teacher preparation in Federal Government-owned universities in South-East Nigeria. Based on the findings of the study, it was recommended, among others, that teacher education programmes should adopt learning management systems to provide hands-on learning and training opportunities on the use of blended learning to pre-service science teachers.*

***Keywords*:** Quality Assurance, Blended Learning, Science Education, Teacher Education

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**Résumé**
*L'avènement des technologies de l'information et de la communication ainsi que l'acceptation et le progrès continus de l'apprentissage en ligne après la pandémie de COVID-19 ont imposé aux enseignants des exigences de compétences et d'aptitudes uniques s'ils veulent réussir dans leur carrière. Cette étude a examiné dans quelle mesure les programmes de préparation des enseignants de sciences au sud-est du Nigeria intègrent l'apprentissage hybride. Deux cent dix (210) enseignants de sciences en formation et trente-deux (32) formateurs d'enseignants de sciences dans trois universités publiques fédérales de la region du sud-est du Nigéria constituaient l'échantillon de l'étude. L'instrument de collecte des données, dont les versions étaient différentes pour les formateurs d'enseignants et les enseignants de sciences en formation initiale, et dont le coefficient de fiabilité Cronbach Alpha était respectivement de 0,86 et 0,81, était un instrument de 21 questions élaboré par le chercheur et intitulé Blended Learning in Science Teacher Preparation Questionnaire (BLiSTPQ) (Questionnaire sur l'apprentissage mixte dans la préparation des enseignants de sciences). Trois questions de recherche et deux hypothèses ont guidé l'étude. Les résultats ont indiqué que l'apprentissage hybride n'est généralement pas adopté dans la formation initiale des enseignants de sciences dans les universités fédérales du sud-est du Nigeria. Sur la base des résultats de l'étude, il a été recommandé, entre autres, que les programmes de formation des enseignants adoptent des systèmes de gestion de l'apprentissage pour offrir aux enseignants de sciences en formation des opportunités d'apprentissage et de formation pratiques sur l'utilisation de l'apprentissage hybride.*

***Mots-clés*** **:** Assurance Qualité, Apprentissage Hybride, Enseignement Scientifique, Formation des Enseignants

## Introduction

In September 2015, one hundred and ninety-three (193) United Nations member states unanimously adopted the seventeen (17) sustainable development goals (SDG), and their one hundred and sixty-nine (169) targets as a universal agenda to end all dimensions of poverty and inequality, as well as craft a just and secure world for people and the planet (FAO, undated; United Nations, 2017). The fourth sustainable development goal (SDG-4) is committed to ensuring inclusive and equitable quality education and promoting lifelong learning

opportunities for all. To help countries improve their capacity for monitoring their progress in SDG-4 attainment, the United Nations Educational, Scientific and Cultural Organisation's Institute for Statistics (2022) updated the list of targets and indicators for achieving quality education. These consist of ten specific and measurable targets. Seven of the targets are expected outcomes while three are means of achieving these outcomes. These means of achieving SDG-4 outcomes are:

(i) Build and upgrade education facilities that are child, disability, and gender-sensitive, and providing safe, non-violent, inclusive, and effective learning environments for all;
(ii) By 2020, substantially expand globally, the number of scholarships available to developing countries, in particular least developed countries, small island developing states, and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries;
(iii) By 2030, substantially increasing the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least-developed countries and small island developing States (UNESCO, 2022, p.3).

It is a generally accepted maxim that no education system may rise above the quality of its teachers, as the quality of any educational system is directly linked to the quality of its teachers. Nigeria, as a nation, concedes to this principle in its national policy on education (Federal Republic of Nigeria, 2004, 2013), which accentuates the pivotal role of quality teachers in the provision of quality education.

For the United Nations, quality education is one that ensures inclusive and equitable education that promotes lifelong opportunities for all. It is one that "helps children acquire basic literacy, enjoy learning without fear, and feel valued and included, irrespective of where they come from" (United Nations Children's Fund, UNICEF, 2018). Quality education, according to the United Nations Educational, Scientific and Cultural Organisation, UNESCO (2022), "specifically entails issues such as appropriate skills development, gender parity, provision of

relevant school infrastructure, equipment, educational materials and resources, scholarships or teaching force". Thus, achieving and maintaining quality education is intrinsically related to what teachers do to foster student learning.

Before the Covid-19 pandemic, increasingly irreversible and almost unlimited advancements in interconnectivity, access to information on the internet, and improvements in information and communication technologies (ICT) had modified people's lifestyles as it allowed real-time interactions between people, territories, and organisations in diverse economic, cultural, political and educational domains (Li & Lalani, 2020; Barlow-Jones & Van Der Westhuizen, 2013; and Shopova, 2014). Thus, people seemed to rely more on digital devices for their day-to-day activities. This situation was further reinforced by the COVID-19 pandemic in the year 2020, which caused almost all nations of the world to impose lockdowns and social distancing as a means of curbing the spread of the disease. These measures "created the largest disruption of education systems in history" (United Nations, 2020; OECD, 2020a), and caused nations to resort to e-learning. E-learning is characterised by teaching and learning undertaken remotely, over the internet, and on digital platforms. E-learning kept students occupied in a bid to redeem the disrupted academic activities, as face-to-face classes were impossible to achieve amid the pandemic (United Nations, 2020; Li & Lalani, 2020; OECD, 2020a).

Although teachers across the globe had been saddled with the responsibility of implementing online learning using innovative technologies during the pandemic, most of them, especially secondary school teachers in sub-Saharan Africa, were largely unprepared to support continuity of learning as they lacked the most basic ICT skills (OECD, 2020a). This is because they had not received minimum training that included digital skills, were not sufficiently prepared to adapt to new teaching methodologies, and as such struggled with facilitating quality online learning during the Covid-19 pandemic (United Nations, 2020; International Task Force on Teachers for Education-2030, 2020). This assertion is echoed by OECD's (2021) report that 43% of upper secondary school teachers in countries which

took part in a 2018 Teaching and Learning International Survey carried out prior to the pandemic, felt unprepared to use ICT for teaching.

These challenges faced by teachers have highlighted the need for initial and in-service training of teachers on new methods of education implementation (UNESCO, 2021). To improve teachers' ICT preparedness and digital pedagogical competences, so as to meet emerging societal demands from formal education, teacher training should deliberately incorporate ICT usage and instruction (OECD, 2021). This has become imperative, and researchers such as Sharma (2021), Mishra, (2020), and OECD (2020a), have advocated for teaching and learning modes combining traditional and modern learning models that incorporate digital technologies. This is in response to the profound changes in the education sector prompted by the Covid-19 pandemic, as well as rapid advancements in ICT.

Teaching and learning modes that integrate the face to face (traditional) classroom instruction with modern digital learning platforms and tools, are generally referred to as blended learning. For Alammary, Sheard, and Carbone (2014), "blended learning courses are those that: (i) thoughtfully integrate different instructional methods such as: lecture, discussion group, self-paced activity, etc.; and (ii) contain both face-to-face and computer-mediated portions" (Alammary, Sheard, and Carbone, 2014, p. 443). Blended learning denotes hybrid learning modes that adopt complementary face-to-face classroom instruction and online learning which permits students to have control over when, where and the pace of their learning (Coccoli, Guerico, Maresca & Stanganelli, 2014; Koch, 2014). Blending face-to-face and online learning facilitates the combining of the benefits of both environments as it supports students' development of new knowledge and skills that are transferable to the workplace environment, by changing the role of the teacher/instructor to that of a facilitator, moving learning activities online, and transferring the responsibility for learning to the student (Hilliard, 2015; Koch, 2014). To successfully implement either online or blended learning, teachers need to be competent in integrating technologies, as well as accessing, and using pedagogies that incorporate digital technologies, online learning and a variety of educational materials and resources. Thus, teachers require new forms

of professional development methods which should include both online and face-to-face learning (Le & Pham, 2021; Bryka, 2017; Alonta, Obi and Okolocha, 2022).

In view of the profound changes in education, prompted by the society's response to the pandemic, and the rapidly evolving nature of ICT, teachers now require higher levels of digital literacy in addition to specialised pedagogical knowledge to successfully integrate ICT into teaching and learning. To prepare teachers in using ICT for teaching, it is imperative that ICT is consciously incorporated into teacher education programmes, thus providing opportunities for pre-service teachers to receive hands-on training in online pedagogy. Therefore, this study sought to investigate the extent to which science teacher preparation programmes in South-East Nigeria incorporate blended learning.

The purpose of this study is to investigate the extent to which science teacher preparation programmes in South-East Nigeria incorporate Blended Learning. Specifically, the study intends to:

1. identify the online learning platforms from which pre-service science teachers take courses in Universities in South-East Nigeria;
2. examine teacher educators' and pre-service science teachers' perceptions of constraints to the utilisation of blended learning in science teacher preparation in Universities in South-East Nigeria; and
3. investigate teacher educators' and pre-service science teachers' attitude towards the utilisation of blended learning in science teacher preparation in Universities in South-East Nigeria.

## Research Questions

The following research questions were formulated to guide the study.

1. What are the online learning platforms from which pre-service science teachers take courses?
2. What are teacher educators' and pre-service science teachers' perceptions of constraints to the utilisation of blended learning in Science Teacher Preparation?

3. What are teacher educators' and pre-service science teachers' attitude towards the utilisation of blended learning in Science Teacher Preparation?

## Hypotheses

The following null hypotheses, which will be tested at 0.05 level of significance, have been formulated to guide this study.

1. There is no significant difference between teacher educators' and preservice science teachers' perception of the constraints to implementation of blended learning in pre-service science teacher preparation in public universities in South-East states in Nigeria.
2. There is no significant difference in teacher educators' and preservice science teachers' attitudes towards the implementation of blended learning in pre-service science teacher preparation in public universities in South-East states in Nigeria.

## Methodology

The study adopted a descriptive survey design to elicit information from pre-service science teachers and teacher educators, on the extent of implementation of blended learning in science teacher preparation in federal government-owned universities in South-East Nigeria. The sample for the study consisted of a total of 210 pre-service science teachers drawn in clusters from a population of 673 final year (400 Level) pre-service science teachers, and 32 teacher educators, drawn from a population of 92 science teacher educators in three federal government-owned universities (offering science education) in South-East Nigeria. Pre-service science teachers were chosen for the study because they will be saddled with the responsibility of educating Nigerians in the sciences. The instrument for data collection was a 21-item, researcher-developed, instrument titled "Blended Learning in Science Teacher Preparation Questionnaire (BLiSTPQ)". The instrument had two versions: one for teacher educators and the other for pre-service science teachers. Each version of the instrument had three sections. Section one elicited information on the use of explicit online and blended learning activities, platforms, and systems in teacher education. Section two elicited information on respondents'

perceptions of the constraints to the utilisation of blended learning in science teacher preparation. Section three elicited respondents' attitudes toward blended learning. The instruments were validated by an expert in measurement and evaluation and a specialist in science education. To establish the reliability of the pre-service science teachers' instrument, it was administered once to 20 Science Education students drawn from one public-owned university in South-East Nigeria. These students are part of the target population but were carefully excluded when data for the study was collected. The instrument had a Cronbach Alpha reliability coefficient of 0.81. To establish the reliability of the Teacher Educators' instrument, it was administered once to seven Teacher Educators in a public-owned University in a South-South state of Nigeria. These teacher educators, though not part of the target population of teacher educators, are comparable to them in all ramifications. These teacher educators were excluded when the data for the study was collected. The teacher educators' version had a Cronbach Alpha reliability coefficient of 0.86. The instruments were administered online using google forms. Respondents were sent the link to the survey and were required to anonymously respond to the survey. Data collected by the instruments were used to answer the research questions.

The data collected by the instrument were analysed using Mean and Standard Deviation, while the independent sample t-test was used to test the hypotheses. Item response criterion mean of 2.50 and above was considered acceptable, while item means below 2.50 were considered not acceptable to answer the research questions.

## Results

**Research Question 1:** What are the online learning platforms from which pre-service science teachers take courses?

**Table 1**: Online MOOC platforms from which pre-service science teachers take full certifying courses

| Online Learning Platforms from Which Students Take Full Certifying Courses (MOOC – Massive Open Online Courses) | Pre-service Science Teachers' Responses (%) | Teacher Educators' Responses (%) |
|---|---|---|
| **edX** | 51 (34.3) | 02 (0.64) |
| **Coursera** | 42 (20.0) | 0 (0.00) |
| **Udemy** | 29 (13.8) | 0 (0.00) |
| **HavardEx** | 7 (3.33) | 0 (0.00) |
| **LinkedIn Learning** | 16 (7.62) | 0 (0.00) |
| **Others (FutureLearn, Udacity, Skillshare, Alison, Codeacademy, Pluralsight)** | 81 (38.57) | 0 (0.00) |
| **None** | 42(35.83) | 30 (93.75) |

**Table 2:** Online learning platforms deployed in pre-service teacher preparation in South-East Nigeria

| Learning Management Systems deployed in pre-service science teacher education in universities in South East Nigeria | Pre-service Science Teachers' Response (%) | Teacher Educators' Response (%) |
|---|---|---|
| **Moodle** | 5(4,17) | 01(3.13) |
| **Blackboard** | 0(0.00) | 0(0.00) |
| **Schoology** | 0(0.00) | 0(0.00) |
| **Canvas** | 0(0.00) | 0(0.00) |
| **Google Classroom** | 21(17.50) | 4(12.5) |
| **Others** | 0(0.00) | 3(9.38) |

Table 1 shows that pre-service science teachers took certificate-awarding courses from some online learning platforms. This appears to be done independently, without formal instructions from their teacher educators. Data in Table 2 indicate that Moodle and Google Classroom are mainly used in pre-service science teacher preparation.

**Research Question 2:** What are teacher educators' and pre-service science teachers' perceptions of constraints to the utilisation of blended learning in Science Teacher Preparation

**Table 3:** Teacher educators' and pre-service science teachers' perceptions of the constraints to the utilisation of blended learning in science teacher preparation.

| | Constraints to the utilisation of blended learning in pre-science teacher preparation | Teacher Educators' Perception $N_1$= 32 | | Preservice teachers' response $N_1$= 210 | | Remarks |
|---|---|---|---|---|---|---|
| | | $\bar{x}_1$ | $SD_1$ | $\bar{x}_2$ | $SD_2$ | |
| 1 | Inadequate supply of ICT tools such as computers, Smart Boards, Laptops | 3.44 | 0.95 | 3.01 | 1.08 | Agree |
| 2 | Insufficient supply of internet services within the university | 3.28 | 0.96 | 2.94 | 1.08 | Agree |
| 3 | Teacher educators' inadequate knowledge and skills in integrating online learning to face-to-face learning | 3.03 | 0.90 | 3.09 | 0.96 | Agree |
| 4 | Teacher educators do not have adequate technological skills to teach part of their courses online | 3.19 | 1.03 | 2.75 | 1.10 | Agree |
| 5 | The fixed teacher education curriculum does not allow teacher educators to implement blended learning in teaching | 2.84 | 0.77 | 2.54 | 0.86 | Agree |

| | Constraints to the utilisation of blended learning in pre-science teacher preparation | Teacher Educators' Perception $N_1$= 32 | | Preservice teachers' response $N_1$= 210 | | Remarks |
|---|---|---|---|---|---|---|
| | | $\bar{x}_1$ | $SD_1$ | $\bar{x}_2$ | $SD_2$ | |
| 6 | Lack of adequate Institutional support for integrating blended learning | 3.22 | 0.83 | 2.53 | 0.94 | Agree |
| 7 | The structure of the semester calendar and time-table does not permit use of blended learning approaches in teacher education | 2.69 | 1.03 | 2.68 | 0.92 | Agree |
| 8 | Teacher educators do not have access to internet-enabled devices | 2.38 | 0.71 | 2.48 | 0.95 | Disagree |
| 9 | Pre-service science teachers do not have access to internet-enabled devices | 2.56 | 0.84 | 2.71 | 0.92 | Agree |
| | Grand Mean | 2.96 | 0.89 | 2.75 | 0.98 | |

Table 3 shows that all items (except item 8) had mean scores above 2.50, and standard deviations ranging from 0.71 to 1.03 for teacher educators, and 0.86 to 1.10 for pre-service science teachers. This result indicates that both teacher educators and pre-service science teachers perceived that the various factors identified constrained the utilisation of blended learning in teacher preparation in universities in south-eastern states in Nigeria. They also did not agree that teacher educators do not have access to internet-enabled devices. The small standard deviation values indicate that the respondents' responses did not vary widely from the mean for each of the items.

**Research Question 3:** What are teacher educators' and pre-service science teachers' attitude towards the utilisation of blended learning in Science Teacher Preparation?

**Table 4:** Teacher educators' and pre-service science teachers' attitude towards the utilisation of blended learning in science teacher preparation

| | **Pre-service science teachers' attitude towards Blended Learning** | **Teacher Educators' attitude $N_1$= 32** | | **Pre-service science teachers' attitude $N_1$= 210** | | **Remarks** |
|---|---|---|---|---|---|---|
| | | $\bar{x}_1$ | **$SD_1$** | $\bar{x}_2$ | **$SD_2$** | |
| **1** | The teacher education curriculum is overloaded, it is cumbersome to make pre-service science teachers take online courses that are not part of the already prescribed curriculum | 2.31 | 0.82 | 2.87 | 0.98 | Disagree |
| **2** | Allowing students to take full courses from online learning management platforms such as Coursera, EdX, and others, may distract them | 2.06 | 0.44 | 2.19 | 1.13 | Disagree |
| **3** | Having students study part of any given course online may enhance their class participation | 3.47 | 0.51 | 2.99 | 1.00 | Agree |
| **4** | Taking courses online does not improve a student's learning | 1.92 | 0.78 | 1.63 | 1.00 | Disagree |
| **5** | Fulltime students should not take any of their courses online | 1.66 | 0.48 | 1.53 | 0.69 | Disagree |

| | Pre-service science teachers' attitude towards Blended Learning | Teacher Educators' attitude $N_1$= 32 | | Pre-service science teachers' attitude $N_1$= 210 | | Remarks |
|---|---|---|---|---|---|---|
| | | $\bar{x}_1$ | $SD_1$ | $\bar{x}_2$ | $SD_2$ | |
| **6** | When students access their course materials online, it may decrease their participation in class | 2.25 | 0.98 | 1.73 | 0.97 | Disagree |
| **7** | Accessing course materials online may enhance pre-service science teachers' interest in any given course | 2.56 | 0.914 | 2.36 | 1.06 | Disagree |
| | Grand Mean | 2.34 | 0.70 | 2.19 | 0.98 | |

Data in Table 4 indicate that the grand mean of both teacher educators' and pre-service science teachers' attitudes towards the utilisation of blended learning in science teacher preparation was below 2.50.

**Hypothesis 1:** There is no significant difference between teacher educators' and preservice science teachers' perception of the constraints to implementation of blended learning in pre-service science teacher preparation in public universities in South-East states in Nigeria.

Table 5: t-test analysis of the difference between teacher educators' and preservice science teachers' perception of the constraints to implementation of blended learning.

| Groups | N | Mean | Standard Deviation | t- cal | t -tab | Df | Sig. | Decision |
|---|---|---|---|---|---|---|---|---|
| **Teacher Educators** | 32 | 2.96 | 0.89 | 0.933 | 1.960 | 240 | 0.352 | Not Significant |
| **Pre-service Science Teachers** | 210 | 2.75 | 0.98 | | | | | |

Table 5 shows that the calculated t-test value of 0.933 is less than the critical t-test value of 1.96 at degree of freedom of 240, and 0.05 level of significance. Since the calculated t-value is less than the tabulated t-value, the null hypothesis that there is no significant difference between teacher educators' and preservice science teachers' perception of the constraints to implementation of blended learning in pre-service science teachers' preparation in federal government-owned universities in South-East Nigeria is not rejected.

**Hypothesis 2:** There is no significant difference in teacher educators' and preservice science teachers' attitudes towards the implementation of blended learning in pre-service science teacher preparation in public universities in South-East states in Nigeria.

**Table 6:** t-test analysis of the difference between teacher educators' and preservice science teachers' attitudes toward the implementation of blended learning

| Groups | N | Mean | Standard Deviation | t cal | t-tab | Df | Sig. | Decision |
|---|---|---|---|---|---|---|---|---|
| **Teacher Educators** | 32 | 2.32 | 0.70 | 0.171 | 1.960 | 240 | 0.864 | Not Significant |
| **Pre-service Science Teachers** | 210 | 2.19 | 0.98 | | | | | |

Table 6 shows that the calculated t-test value of 0.171 is less than the critical t-test value of 1.96 at 240 degrees of freedom, and 0.05 level of significance. Since the calculated t-value is less than the tabulated t-value, the null hypothesis that there is no significant difference between teacher educators' and preservice science teachers' attitudes towards the implementation of blended learning in pre-service science teacher preparation in federal government-owned universities in South-East Nigeria is not rejected.

## Discussion of Findings

The findings from research question 1 indicate that no form of blended learning is incorporated in pre-service science teacher preparation programmes in federal government-owned universities in South-East

Nigeria. This finding corroborates OECD's (2020a) assertion that most secondary school teachers in sub-Saharan Africa had not received basic training that included digital skills, and as such were not sufficiently prepared to facilitate quality online learning. This finding is at variance with Sharma's (2021) and OECD's (2021) opinion that teacher training should deliberately incorporate ICT usage and instruction in order to improve teachers' digital pedagogical competencies.
The responsibility of training quality teachers with the right competencies needed to excel in their chosen careers falls within the purview of universities.

The findings from research question 2 and hypothesis 1 indicate that teacher educators and pre-service science teachers unanimously perceive that the inadequate supply of ICT tools, internet-enabled devices, and internet services within the university are the constraints to the implementation of blended learning in teacher preparation in federal government-owned universities. This finding supports Alonta, Obi and Okolocha's (2022) submission that the utilisation of blended learning depends greatly on access to and availability of technological devices and internet services. These factors translate to the dearth of institutional support for integrating blended learning and buttress Okonjo-Iweala's (2012), opinion that several Nigerian universities are producing graduates that lack the right skills needed to perform tasks required in their chosen fields. To successfully use pedagogies that incorporate digital technologies in their classrooms, pre-service science teacher education should incorporate online learning activities as well as face-to-face learning in a blended approach. The t-test analysis of the difference between teacher educators' and pre-service science teachers' perception of the constraints to implementation of blended learning in pre-service teacher preparation was non-significant. The study did not detect any differences between the teacher educators' and pre-service science teachers' perceptions of the constraints to blended learning implementation in pre-service science teacher preparation.

The findings of the study from research question 3 suggest that both teacher educators and pre-service science teachers (with 2.34 and 2.19 grand mean respectively) had unfavourable attitudes towards the

utilisation of blended learning in science teacher preparation. T-test analysis of the group means also indicated that there were no significant differences in teacher educators' and pre-service science teachers' attitudes towards the utilisation of blended learning in science teacher preparation. This finding is at variance with Le and Pham's (2021) finding that pre-service teachers favoured the use of blended learning in their training programmes. Le and Pham suggested that positive perception of blended learning tended to increase with students' greater exposure to, and familiarity with blended learning. This divergent finding thus necessitates that blended learning be adopted in pre-service science teacher preparation programmes, in order to improve their attitude towards blended learning, so as to achieve quality teacher education.

## Conclusion

In conclusion, this study has found that online learning platforms such as Moodle, Blackboard, Canvas and others are generally not used by Science Teacher Educators in the preparation of Pre-service science teachers. Also, the inadequate supply of Information and Communication Technology tools to institutions for the training of preservice science teachers is a serious constraint to the implementation of Blended learning in Science Teacher Education programmes in Universities in South-East Nigeria.

## Recommendations

Based on the findings from this study, the following recommendations have been made:

1. Science Educators in the various training institutions should be encouraged to undertake training and retraining programmes on new technologies to enable them to embrace the use of online learning platforms.
2. Universities should consider the adoption of Learning Management Systems for their institutions for more engaging teaching and learning, hands-on training of pre-service science teachers, and to enable easier access to learning materials, assessment and feedback for students and teachers.

3. Universities should be adequately funded for the supply of Information and Communication Technology tools such as laptops, computers and internet facilities to enable the utilisation of Blended Learning in Science Teacher Education programmes.

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# Inclusion of disadvantaged people in National Open University of Nigeria: Correctional Services Inmates' Perspective

# Inclusion des personnes défavorisées à l'Université nationale ouverte du Nigeria: le point de vue des détenus des services correctionnels

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## Abstract

*National Open University of Nigeria (NOUN) has taken university education to the door-step of Nigeria Correctional Service (NCS). The hitherto marginalised prison inmates have been provided with opportunity to have access to university education within the confine of correctional facilities in the country. The study explores inclusion and impact of Nigerian correctional inmates to university education in Nigeria. The study is located within the pedestal of qualitative method. In line with qualitative approach adopted, interpretive paradigm was employed to make sense of the inmates' narrative. The researcher purposively selected twenty-one inmates for the study. Due to the sensitive nature of the study, all ethical issues were adhered to. Semi-structured interview was developed and administered on the participants. The information gathered were transcribed, coded, categorised and emerging themes analysed using narrative analysis. Findings indicated that inmates perceived university education as human development, and crime prevention and control strategies. Furthermore, the inmates stated that the acquisition of university degree has impacted their self-actualisation and offered them various opportunities for employment after jail term.*

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*Based on the findings, it was recommended among others that Federal Government should focus on supporting rehabilitation through provision of secondary and university education in order to reduce recidivism.*

***Keywords***: Inclusion, correctional service inmates, NOUN, university education

**Résumé**

*La National Open University of Nigeria (NOUN) a étendu l'éducation universitaire aux portes du Nigeria Correctional Service (NCS) <<Les Services Correctionnels du Nigeria>>. Les détenus, autrefois marginalisés, ont désormais la possibilité d'accéder à l'enseignement universitaire dans les établissements correctionnels du pays. L'étude explore l'inclusion et l'impact des détenus nigérians sur l'enseignement universitaire au Nigeria. L'étude s'inscrit dans le cadre de la méthode qualitative. Conformément à l'approche qualitative adoptée, un paradigme interprétatif a été utilisé pour donner du sens au récit des détenus. Le chercheur a sélectionné délibérément vingt et un détenus pour l'étude. En raison de la nature sensible de l'étude, toutes les questions éthiques ont été respectées. Un entretien semi-structuré a été élaboré et administré aux participants. Les informations recueillies ont été transcrites, codées, catégorisées et les thèmes émergents ont été analysés à l'aide de l'analyse narrative. Les résultats indiquent que les détenus considèrent l'éducation universitaire comme un développement humain, ainsi que des stratégies de prévention et de contrôle du crime. De plus, les détenus ont déclaré que l'obtention d'un diplôme universitaire a eu un impact sur leur auto-réalisation et leur a offert diverses opportunités d'emploi après leur peine. Sur la base des résultats, il a été recommandé, entre autres, que le Gouvernement Fédéral se concentre sur le soutien à la réhabilitation en fournissant une éducation secondaire et universitaire afin de réduire la récidive.*

***Mots-clés* :** Inclusion, Détenus du Service Correctionnel, NOUN, Enseignement Universitaire

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## Introduction

The issue of provision of formal education to the disadvantaged or less-privileged people such as girl children, nomadic children, Almajiri children and out-of-school children has been canvassed by relevant government agencies in Nigeria. In fact, after Nigerian civil war,

successive governments have tried to provide formal education to this class of people in the country. For instance, General Yakubu Gowon established many Federal Government Girls' Colleges in many parts of Nigeria to cater for girl children education in the country (Clarke, 2021). Equally, General Olusegun Obasanjo in 1976 introduced Universal Primary Education (UPE) to cater for vulnerable children who could not access formal education due to lack of fund (Odewale, 2019). Similarly, General Ibrahim Babangida introduced nomadic education in 1986 to ensure that the children of the nomadic pastoralists and migrant fishermen are formally integrated into the society through formal education (Akpan, 2015).

In another vein, President Goodluck Ebele Jonathan in 2012 launched Almajiri education to reduce the illiteracy among Almajiri children (Teke, Katami & Khalid, 2020). Recently, President Muhammadu Buhari through Universal Basic Education Commission (UBEC) has come up with a proposal to establish the Open School System (OSS) to provide out-of-school-children with basic education which is at staggering 10.2 million (Jegede, 2021). All these measures were aimed at providing formal education to the vulnerable children in the society. From all indications, it would not be out of place to applaud both successive and current administration in Nigeria for ensuring that all Nigerians irrespective of place of birth, state of origin, gender, class, among others are provided with a good platform to access formal education. However, could we comfortably say that the wind of education inclusiveness blowing across the world have been embraced by all manners of people in our society? The answer to this question is on the negative. This negative response is based on the fact that there are still vulnerable people in the country, that the Federal Government of Nigeria have hitherto sidelined in the provision of formal education (Obioha, 2011). In fact, without mincing words, the government seems to have failed her Constitutional responsibility in the provision of formal education to Nigeria Correctional Service (NCS) inmates (Anyanwu, Onyechi, Adikwu, Ezegbe & Otu, 2018). However, the inability of the inmates to be provided with a good platform to access formal education made them susceptible to commit another crime, after they might have been freed from the first offense (Gaes, Bales & Scaggs, 2016). In this study, prison inmates are seen as persons who

are legally confined to a place, usually the prison, against their will by the law court due to crime they have committed.

Since the establishment of the National Open University of Nigeria (NOUN), the institution has taken the responsibility of providing university education to the inmates of NCS in Nigeria. However, the NOUN's decision in providing university education to prison inmates in Nigeria remains its greatest commitment towards breaking all barriers to university education. Similarly, it also provides a fertile ground in extending equity and social justice to the prison inmates. A critical review of the literature indicated that studies have been conducted on prison inmates and access to higher education. For instance, Adeyeye (2019) looked at challenges and prospects of e-learning for prison education in Nigeria. Ndunagu and Tanglang (2019) conducted a study on recidivism panacea in Nigerian prisons through digital literacy: National Open University of Nigeria (NOUN) initiatives. Outside the shore of Nigeria, Vandala (2019) researched on transformative effect of correctional education. Davis (2021) worked on effectiveness education for prison. Whilst Obrien (2022) looked at education as a practice for freedom, among others. From all indications, there is no study conducted on the above topic, therefore, the gap will be filled by the current study.

## Purpose of the study

The principal purpose of the study is to look at the inclusion of disadvantaged people in National Open University of Nigeria with a particular reference to Nigerian correctional services inmates. The specific objectives of the study are; to examine how NCS inmates perceive university education within prison wall. Furthermore, to determine the effect of university education on the NCS inmates. Based on the objectives of the study stated above, the following research questions are formulated to guide the study. How does NCS inmates perceive university education within prison wall? What are the effects of university education on the NCS inmates?

## Theoretical framework

In this study, the researcher deployed rehabilitation theory to tease inclusiveness and effect of university education on correctional service inmates in Nigeria. This theory was first developed by Robert Martinson in 1974, to look at several programs that have been developed for individuals or people who have been convicted of an offense. In other words, rehabilitation theory looks at those things are put in place which make criminals to change or refrain from their criminal activities once or upon their return to the society from jail. In fact, these things that actually make them to change from criminality are; receive of psychiatric therapy, counselling, vocational training, higher education, drug-rehabilitation programs (Sherman, 2002), and any other techniques which is based on scientific methods in order to reduce recidivism (Cragg, 1992). From the education point of view, any criminal once convicted and sentence to prison would stop criminality when he/she is able to proper formal education (Ellingston, 1948; Champion & Mays, 1991; Behan, 2014). In another vein, Chapppell (2002) asserted that it is always cost effective to expose inmates to formal education while in prison, because they would refrain from committing crime than to spend huge money on punitive methods towards inmates, because it was asserted by Cassidy & Rydberg (2020) that punishment do not cause any positive change in human being instead it worsens. Similarly, Rhode (2004) was of the view that formal education given to the inmates within the prison enable them to leave the prison with more intellectual skills which may be meaningful and ensure long-term employment. In another hands, Ayu (2004) highlighted that prison must be an avenue for information and intellectual impartation, instead of an institution for discipline and punishment of offenders (Sheridan, 1977; Luxon, 2019; Bun, Kelaher, Sarafidis & Weatherburn, 2020). In other words, violent torture, punishment and mutilation of convicts' bodies and cruel executions does not deter criminals from committing similar or another crime. Therefore, it is high time this primitive strategy of crime control should be replaced with the provision of quality university education for inmates (Dostoyevsky, 2017). From the foregoing conversation, it is appropriate to adopt rehabilitation theory to investigate the phenomenon under study.

## Brief genesis of education in prison

Scholars such as Foucault (1977), Ignatieff (1978), Morris and Rothman (1998), Seeds (2022) advanced reason for the emergence of the modern prison and its desire to punish, discipline and control. Notwithstanding the desire to reform prisoners by punitive measures, there are those who wanted them to be educated through religious instruction in order to encourage them to mend their immoral ways, leave their sins behind, hence becoming law-abiding citizens. Morris and Rothman (1998) stated that prison inmates should be taught to work hard to promote personal transformation. Aside from that, O'Donnell (2016), Itzik (2023) was of the view that punishment could be transformative in itself, with the experience of detention, Mahlangu and Zivanai (2023) isolation offering an instructive opportunity for reflection. From all indications, formal education in prison is a new phenomenon that was introduced in the twentieth in Europe century (Borch, 2014). In 1787, certain concerned citizens at London Newgate Prison introduced Pennsylvania Prison Society which later metamorphosised to Correctional Education Movement (CEM) where clergyman named Sir William Rogers first offered instruction to inmates. Later on, David Snedden and some prominent reformers who were interested educating prisoners introduced compulsory attendance to majority of the inmates. Soon after, these reformers introduced juvenile correctional education to identify additional models for use in school settings (Zimbardo, Maslach & Haney, 1999; UNESCO, 2021). From there, Alexander Maconochie who was the Governor of Norfolk Island saw that punishment for prisoners was cruel, instituted many progressive programmes for prison inmates. This programme was educational in nature, whereby more marks a prisoner score in the quiz, the shorter the prison sentence. The introduction of education in the four wall of prison necessitated other countries of the world to adopt this progressive penal policy. Currently, prison inmates are doing masters and doctoral in various programmes in either conventional universities in the world or open and distance learning institutions such as NOUN (Adeyeye, 2019).

## Higher Education in the Prison

According to Earle and Mehigan (2019), Open University of United Kingdom (OUUK) has been providing prison inmates with access to tertiary education since the late 1960s. Similarly, there was a strong prison and university partnership which allowed prisoners to study for a degree during their sentence in Poland. It is pertinent to say that most of these inmates use distance learning to overcome structural barriers to university education (Becker-Pestka, 2017). In the same vein, Downes (2014) declared that an institution called Modern Humanitarian Academy (MHA) located in Russia has provided distance education from primary to higher education and postgraduate programmes to prison inmates in the country. In the area of payment of tuition fee, Downes (2014) further stated that prisoners were made to pay reduced fees for courses they offered. In recent times, the provision of university education in prison has expanded. For instance, in the United States of America many universities have been providing prison inmates with university education as part of their community outreach programmes (Zoukis, 2014). According to Martin (2019), prisons and higher education institutions collaborated to create opportunities for more than 40,000 'inside prison' and 'outside prison' learners. University of Cambridge of UK launched a similar initiative in 2015 (Ludlow, Armstrong, & Bartels, 2019). It was argued by Ludlow et al (2019) that the main objective of these learners (inside and outside) to study together is to learn with and from each other through dialogue and the sharing of experiences. The collaborative programme is aimed at challenging perception among different categories of learners hence promoting collaborative engagement and positive dialogue. Within the Nigeria context, the NOUN was the first university to introduced university education for prison inmates (Omazu 2018). Furthermore, Sabiu-Kaduna (2019) reiterated that the institution (NOUN) did not only enroll the inmates, however, it went a step further to pay for tuition fee for 3,000 prison inmates studying both undergraduate and postgraduate degrees in 2019 (Ismaila, 2020).

## Brief genesis of prison inmates in NOUN

In 2006, NOUN introduced a study centre for the first time at the Maximum-Security Prison in Kirikiri, Lagos for educating prison inmates (Ogidan, 2010). At the formative stage of this study centre, the admission of students (inmates) was based on the procurement of the university's admission form in which most of inmates did not have the fund to purchase it (Omazu, 2018). This was because, the majority of intended applicants were incarcerated, therefore, lacked financial power to purchase the forms. In order to ensure the accessibility of the inmates to university education, the procurement of admission forms was done on behalf of the inmates by private individuals, (Ariyo, 2021) religious organisations, NGOs, and corporate institutions such as banks (Omazu, 2018). With the appointment of new Vice Chancellor in 2016, the entire process of admission was reviewed. The university management ensured that inmates wanting to enroll for university programme are provided with admission form free of charge. Moreover, tuition fees were completely given waiver for all the prison inmates (Otu, 2015). Similarly, the university also provided infrastructures and instructional materials which enable the inmates to study in a conducive environment (Adama & Agbokutaye, 2021). In furtherance to the above, the university assigned dedicated, professional counsellors and psychologists to provide counselling services to the inmates (Omazu, 2018). With initial student population of ten at Kirikiri Maximum Prison in 2006, the university now has increased to twelve Special Study Centres that cater for over three thousand inmate students in 2019 (Saleh, 2019). However, over the years, many inmate students have graduated. Currently, there are about one thousand four hundred and forty inmate students pursuing one degree programme or the other in 2023 academic year (Adesina, 2023).

## Benefits of formal education to prison inmates

A lot of benefits of university education to prison inmates and society has been advanced by scholars. For instance, 18-month study conducted by Jenkins, Pendry, and Steurer (1993) using four subgroups (Adult Basic Education, GED, vocational education and postsecondary students) to investigate recidivism. Therefore, findings revealed that

there was a positive and significant benefit of education for prison inmates at all levels when compared to similar inmates who did not receive any educational program while incarcerated. In a similar manner, Harer's (1994) investigation for three years using 1,205 released inmates showed a strong positive relationship between education and reduction in recidivism. In another vein, findings indicated that the more education the released inmates had upon entering the system, the less likely the inmate was to recidivate. Furthermore, Bozick, Steele, Davis, and Turner (2018) acknowledged a total of 57 studies that evaluated recidivism and 21 studies that assessed employment following inmates' participation in education programme in prison. It was also discovered that prison inmates participating in educational programmes were 28 per cent less likely to re-offend than detainees who did not participate in the programme. However, it was further established that this reduction in the rate of recidivism did not always lead to gainful employment after release. Inmates who did not participate in education while in the prison were not likely to obtain post-release employment than those who did (Bozick at al. 2018).

## Research Methodology

### Research Design

The aim of the study is to explore the inclusion of prison inmates in higher education by the National Open University of Nigeria, in order to gain insight about their educational pursuit and life aspiration after jail terms. Ordinarily, quantitative methods were supposed to be used if these researchers were investigating the nature of prison inmates participating in university education in Nigeria and collecting numerical data**.** Since this is not the case, therefore, it is appropriate to employ qualitative approach to unravel undiluted true-life story of the participants. After all, the proponents of qualitative methods such as Umanailo, Hamid, Hamiru, Assagaf, Bula, Nawawi and Bon (2019); Bazen, Barg and Takeshita (2021) have argued that applying qualitative method in a study is to get a better understanding through first-hand experience, truthful reporting and quotations of actual conversations from the participants. In line with qualitative method

adopted, interpretive paradigm is used to understand prison inmates' lived experience as they access university education within the prison premises. The researchers draw from Kivunja (2017) position argued that the adoption of interpretive paradigm is appropriate in qualitative research in order to get into the heads of the participants being studied and to understand and interpret what they think (perceive) or the meaning they are making of the context.

## Population

The official document obtained on 28th September, 2023 from the National Coordinator, Special Study Centre Office, NOUN indicated that there are twelve (12) Special Study Centres (see table 1), with a population of one thousand four hundred and forty (1440) inmate students as at September, 2023.

**Table. 1: Number of Inmate Students Per Study Centre**

| S/N | Correctional study Centre | Undergraduates | PGD/ Masters | Ph.D | Total number of Inmate Students |
|---|---|---|---|---|---|
| 1 | ABEOKUTA | 104 | 3 | Nil | 107 |
| 2 | AWKA | 26 | 4 | Nil | 30 |
| 3 | ENUGU | 247 | 17 | Nil | 264 |
| 4 | ILESHA | 23 | Nil | Nil | 23 |
| 5 | IKOYI | 72 | 8 | Nil | 80 |
| 6 | KADUNA | 63 | 8 | Nil | 71 |
| 7 | KEFFI | 115 | 12 | 1 | 128 |
| 8 | KIRIKIRI | 299 | 23 | 2 | 324 |
| 9 | KUJE | 224 | 10 | 2 | 236 |
| 10 | LAFIA | 19 | Nil | Nil | 19 |
| 11 | PORT HARCOURT | 154 | 37 | Nil | 191 |
| 12 | UMUAHAIA | 22 | Nil | Nil | 22 |
| | TOTAL | 1320 | 115 | 5 | 1440 |

**Source:** Adesina, 2023

From the look of things, this population is large, considering the fact that this is qualitative research which the sample size is always small.

According to Boddy (2016), sample size in qualitative research also tends to be small in order to support the depth of case-oriented analysis that is central to this mode of inquiry. Similarly, Mocănașu (2020) argued that small sample size is required in qualitative research because, as the study goes on, acquiring more data does not necessarily lead to more information. Therefore, relying on Boddy (2016) and Mocănașu's (2020) position, the researchers deployed purposive sampling technique in selecting the participants.

## Sample Size

Three inmates were purposively selected from each of the seven faculties of the university namely, Faculties of Science, Social Science, Arts, Management Science, Health Science, Education and Law. Out of the twenty-one (21) inmates selected, six were females. Furthermore, the inmate students were selected on the basis of the faculties they belong. There was an intense debate concerning the adoption of small sample size for the study. However, Vasileio, Barnett, Thorpe and Young's (2018) argued that samples in qualitative research usually tend to be small in order to support the depth of case-oriented analysis that is fundamental to this mode of inquiry. Drawing from the Vasileio at al. (2018) position, the researchers selected twenty-one inmates in order to in-deptly understand inmates lived narrative and experience for accessing university education.

## Instrument

The instrument used in gathering information was semi-structured interview. The instrument consists of fifteen interview questions which bordered on research topic and research questions developed earlier. For clarity's sake, interview questions between 1 and 8 focused on ways in which inmates perceive university education within prison wall. Whilst, interview questions between 9 and 15 addressed the effect of university education on the NCS inmates. The researchers adopted interview because it allows for collection of detailed information concerning participants' experiences and opinions (Alamri, 2019). On ethical issue, Stuckey (2014) had earlier said that in research work, human protection is paramount and necessary because of privacy and

confidentiality of participants who willingly participates on the study. Drawing from Stuckey's (2014) position, a letter of permission to interview the inmates were written to all the States Controller-General of the NCS to conduct interview with inmate students. For security purpose, the identities of the participants were not used, rather fictitious names were adopted. Furthermore, the consent form was designed and given to all participants to sign indicating their willingness to participate in the study. Additionally, the researchers assured the participants that information they volunteered will be treated for research purposes only. Permission to use an audio-recorder was granted through a signed agreement before individual in-depth interview sessions. During interview, the researchers used audio recorders and field notes to elicit information from the participants. The reason for audio recorders and field notes were to ensure that the information volunteered by the participants were accurately recorded verbatim (Rutakumwa, Mugisha, Bernays, Kabunga, Tumwekwase, Mbonye & Seeley, 2020).

## Data Analysis

After three months of data collection, the raw data was transcribed manually without the use of qualitative analysis software called Nvivo. The reason for transcribing the data manually is to ensure that researchers familiarised themselves with the data in order to analyse it appropriately. The transcribed data were subjected to open coding. The reason researchers adopted openly coded was to reduce the data to manageable size, and still capture the main ideas and issues that the inmates narrated. After coding, the data were categorised and the emerging themes were analysed using narrative analysis. The reason for the choice of narrative analysis, according to Barkhuizen and Consoli (2021) is to uncover the underlying ideologies embedded in inmates' stories and experience.

## Findings

**Research question** 1. How does NCS inmates perceive university education within prison wall?

The themes that emerged from the first research question were human development, and crime prevention and control measure.

### Human development

Most participants actually stated that they were surprised when the idea of accessing university education inside the four walls of a prison was first introduced to them. They went on to state that the reason why accessing university education inside Kirikiri correctional facility was a surprise to them is because within the Nigerian context, prison inmates were always subjected to punitive measure instead of corrective measure. Therefore, allowing them to have access to university education inside the prison was not only a thing of joy but very surprising. Nonso was quick to report that when he was invited by the management staff of the NOUN for course registration in the Department of Political Science, he could not believe his ears because it was a completely new innovation. Notwithstanding the view expressed by Nonso, Musa added that the introduction of university education to prison inmates aside from the fact that it enhances his literacy level, it was also seen as a form of human development. Musa was asked to explain how university education enhances human development. In his response, he said:

> *I must say that education of any kind generally does not only promote intellectual skills, it also equipped the offenders to deal more effectively with daily problems encountered in the community to avoid returning to prison after their released. In fact, this is part of human development.*

In another vein, Peter explained that he was full of joy for being educated to university level in the prison. He said that the reason he was joyful was because he will be able to develop himself by acquiring master degree (M.Sc.) on Cybercrime and Forensic Studies before the

expiration of his jail term. He added that he cannot go back to crime after his release from prison, because he is armed with M.Sc and would comfortably apply for employment. The researchers interrogated further why he would not go back to crime after his release. Peter declared:

> *Studying in NOUN has provided me with the opportunity to see the world differently. Before my imprisonment, I was an unrefined person who disturbed the peace of the community. In fact, this happened because I was not educated. However, my perception towards life have changed as a result of accessing university education. In fact, I have developed physically, socially, mentally and spiritually now, therefore, I cannot go back to crime with degree in my possession.*

In a similar manner, Richard reported that he really appreciative towards NOUN's effort at ensuring that he is educated to the university level during his confinement. He argued that since he registered for first-degree course with NOUN, his life has been changed positively. He claimed that he will be leaving prison yard a better person than when he came in. Furthermore, he mentioned that when he finished his jail term, he would be looking for job employment with his degree acquired from NOUN instead of political thuggery which led to my imprisonment. He concluded that acquisition of university degree is undiluted human development in itself.

**Crime prevention and control**

Another theme that emerged from the question was that acquisition of university degree was another strategy for crime prevention and control. Udoh who is a final year student in the Faculty of Education in one of the correctional service facilities stated that he saw the introduction of university education for inmates as a measure for curbing crime in the society. He went further to tell researchers that no educated person in his right mind will go into criminality. Udoh, therefore, stated that he went into 'pick-pocket' (petty stealing) at motor parks because he was illiterate looking for a means of survival. Looking remorseful, Udoh clearly sworn that he can never go into

criminality of any kind again. He contained that his first degree will surely provide food to him and his family. In a similar manner, Zainab who was in Faculty of Management Science declared:

> *I have to thank the management of NOUN for bring university education to the door-step of the correctional facilities in the country. This is what the Nigerian government should have done to prevent crimes in the society rather punitive measures towards inmates. Tell me how an ex-convict who acquired degree will go back to crime as an educated person, it is not possible. I can comfortably inform you that educating prison inmates is another strategy adopted in controlling crime in our nation.*

Notwithstanding the views expressed by Udoh and Zainab, Okotie's narrative was pathetic and an eye opener to the researchers. Okotie began by saying that some of the social vices such as kidnapping, banditry, armed robbery among others is being been perpetuated by young boys who are between the ages of 14 and 35 years who are school dropped out. Citing example to portray his point, he reported that kidnapping and banditry in the Northern part of Nigeria appears to be perpetuated by young boys who are educational disadvantaged and jobless. He, therefore, calls for the introduction of free and compulsory education at all level in Northern Nigeria. Okotie applauded the management of NOUN for bring university education to the inmates as a measure of crime prevention and control.

**Research question** 2. What are the effects of university education on the NCS inmates?

The following themes were elicited from the second research question and they are explained below.

**Self-actualisation**

Almost all the participants interviewed were of the view that university education for prison inmates offered them a better opportunity to re-discover themselves. Arikawe who is doing Bachelor of Science

(B.Sc.) in Entrepreneurship and Business Management reported that she enrolled for the program because she wanted to fulfill her lifelong aspiration of becoming a university graduate. She maintained that she felt satisfied the day she enrolled for the programme. She went a step further to narrate that she will be a fulfilled girl in life the day she will complete her degree certificate with NOUN. The trio of Aelo, Chibueze and Chinyere who are graduating students in their different fields were interesting. They stated that though they are yet to finish their jail terms, however, the possession of degree certificate is lifelong aspiration and self actualisation. In fact, Chibueze reported that he is so proud and self-fulfilling by being a NOUN student and he promised that when he is out from prison, he will look for white collar job with the degree acquired. Similarly, as evidence of self-actualisation, Aelo declared:

> *Imprisonment does not only result in the loss of freedom movement and opportunities, but it also has a serious psychological effect and stigmatisation. I wish to applaud NOUN for introducing another phase in my life through the provision of university education. I will be self-actualised when I am awarded first degree of NOUN.*

**Opportunity for employment**

It was reported by most of the participants that university education provided by NOUN gives them another opportunity to thrive in life after years of imprisonment. Specifically, Nonso and Peter said that though they were forced to enroll for a degree programme in NOUN, because they were of the view that it was meaningless exercise, until we interacted with our fellow inmates who explained the benefits of degree acquisition, hence their registration for the programme. Nonso particularly maintained that acquisition of degree certificate create opportunity for job engagement and creation. He was very enthusiastic to report that he will be engaged by one of the oil companies which is based in Niger Delta region after his master degree in Geology. He was very scientific when he argued that there is no correlation between job engagement and crime engagement. In a similar circumstance, Ojo reported that university degrees largely keep inmates from returning to

prison, instead it provides job opportunities after serving their jail terms. Zainab frowned at Basic Adult and Vocational Education classes provided by NSC to inmates that it often trains them as carpenters, plumbers, mechanics, tailors, beauticians, among others, instead of provision of formal education for white-collar jobs and self-reliance. She concluded by applauding NOUN's effort at providing inmates with formal education for job employment, security and scholarship in the country.

## Discussion

From the findings, it was discovered that prison inmates perceived university education provided by the NOUN management within prison walls as both human development and crime prevention and control measures. Specifically, all the participants interviewed were of the view that the degree obtained within the four walls of the prison was aimed at developing the inmates physically, intellectually, psychologically and emotionally within and outside the prison walls. In fact, inmates' acquisition of degree certificates initiates them into a better and productive citizen, instead of criminality. This finding is in agreement with Vandala's (2019) assertion which says that university education influence positively enhance inmates' capacity development. Moreover, the finding is also in line with rehabilitation theory adopted which says that the purpose of punishment is to apply treatment and training to the offender so that he/she is made capable of returning to society and functioning as a law-abiding member of the community. Though, the NOUN management looked at the provision of university education to prison inmates from the perspective of human capital development for the marginalised or vulnerable in the society, findings further indicated that university education was a strategy for crime prevention and control. In fact, it was shown by the majority of the participants that most crimes in our society today are committed by youths who are educationally-disadvantaged. From the findings, it may be argued that once a young boy is incarcerated, even for a short time, his line to formal education is broken forever, therefore, there is likelihood of committing another crime once released. In other words, it is appropriate to say that there is a strong link between low levels of education and high rates of criminality. The

finding is line with Otodo's (2017) position who stated that university education for the prison inmates reduces recidivism as well as empowers them with the academic knowledge that can make them stay off crime and become law-abiding citizens.

It was established from the findings that degree acquisition significantly impacts self-actualisation. From all indications, it can be contended that the inmate's self-concept is distorted as soon as he/she arrives prison. Therefore, provision of formal education to inmates does not only promote their personality development, personal growth, but it also ensures self-actualisation of inmates. From the look of things, the impact of formal education on youths are deep and significant and can bring change to their life that gives them an opportunity outside of a life of crime, which promotes self-actualisation. Parker (1990), Jovanić (2011), Oluwasanmi, Babatola and Mayowa, (2018) had earlier discovered that there is a positive correlation between the inmates' educational level on one hand and self-esteem and social self-actualisation on the other.

Findings indicated that formal education aside from creating social reintegration of inmates, promote job employment. It may be argued that exposing inmates to quality formal education helps immensely in improving employability which is thought to the major factor for committing crime. The findings confirmed Hawley, Murphy and Souto-Otero (2013) assertion that university education makes prison inmates to be employable. Therefore, it should be a central part of broader 'package' of support to be offered to the inmates to enable them not to relapse into crime again (Ilechukwu & Ugwuozor, 2017).

## Conclusion

Since the establishment of Prison Service in Nigeria, which recently metamorphosised to Nigerian Correctional Service, this institution was known for the adoption of punitive measures in rehabilitation of inmates. Through scholarly experimentation by the NOUN management, though it has now been slowball into lifesaving programme, university education provided for the inmates was aimed at overall transformation of inmates. Aside from the inmates' overall

transformation, the positive impact that university education has for the inmates is enormous. In fact, from the inmates' perspectives, university education as championed by the NOUN was aimed at prevention of crime and inmates' empowerment.

## Recommendations

In line with the findings of this study, it is recommended that instead of spending huge sum of money keeping in incarcerating prison inmates, the federal government should focus on supporting the inmates through the provision of formal education in order to be self-reliance which will reduce recidivism. Secondly, the three tiers of government (local, state and federal government) in the country should assist NOUN in the provision of more funds in order to expand this noble project to all the correctional facilities in Nigeria for the benefit of inmates and society at large.

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# Assessing the Impact of the Blended Learning Model on Student Learning Outcomes: A Case of KNUST MELS-IDL

# Évaluation de l'Impact du Modèle d'Apprentissage Hybride sur les Résultats d'Apprentissage des Etudiants : le cas de KNUST MELS-IDL

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## Abstract

*The study entails an investigation into the impact of blended model on students' learning outcomes. The study was carried out at the Master of Philosophy (MPhil) Educational Innovations and Leadership Science (MELS) at the Institute of Distance Learning, Kwame Nkrumah University of Science and Technology. The study looked at areas such as identification of the components of the model that makes it helpful in distance learning, assessing the advantages and challenges of the model, and impact of the model on learning outcomes. The theoretical frameworks of the study are the Complex Adaptive Blended Learning System and the Community of Inquiry. The research utilised a mixed method approach, and information was gathered through semi-structured surveys, interviews, and observations. The study involved twenty-five participants consisting of twenty distance learning students and five instructors. The results indicated that the most impactful aspect of the blended approach lies in the integration of both online systems and conventional in-person instruction. It as well has some advantages which include flexibility, recorded videos being available after lectures, with internet connectivity being the main challenge. The impact of the model can be assessed in terms of its ability to help students understand a particular topic, and by comparing it to the conventional in-person instruction.*

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*The study will help the institution figure out the actual impact of the model on students' learning outcomes, and the research should be replicated on other levels of learning institutions like undergraduate studies.*

***Keywords*:** Blended Learning Model, Learning Outcomes, Students, Impact

**Résumé**

*L'étude porte sur une recherche sur l'impact du modèle mixte sur les résultats d'apprentissage des étudiants. Elle a été réalisée dans le cadre du Master of Philosophy (MPhil) Educational Innovations and Leadership Science (MELS) à Institute of Distance Learning, Kwame Nkrumah Université of Science and Technology. L'étude examine des domaines tels que l'identification des composants du modèle qui le rendent utile dans l'enseignement à distance, l'évaluation des avantages et des défis du modèle, et l'impact du modèle sur les résultats d'apprentissage. Les cadres théoriques de l'étude sont le Système d'Apprentissage hybride Adaptatif Complexe et la Communauté de l'Enquête. La recherche a utilisé une approche mixte, et les informations ont été recueillies à travers des études semi-structurées, des entretiens et des observations. L'étude a impliqué vingt-cinq participants, dont vingt étudiants en apprentissage à distance et cinq instructeurs. Les résultats ont indiqué que l'aspect le plus impactant de l'approche hybride réside dans l'intégration des systèmes en ligne et de l'instruction conventionnelle en présentielle. Elle présente également des avantages tels que la flexibilité, la disponibilité des vidéos enregistrées après les cours, avec la connectivité Internet constituant le principal défi. L'impact du modèle peut être évalué en termes de sa capacité à aider les étudiants à comprendre un sujet particulier, en le comparant à l'instruction conventionnelle en personne. L'étude aidera l'institution à déterminer l'impact réel du modèle sur les résultats d'apprentissage des étudiants, et la recherche devrait être reproduite dans d'autres niveaux d'institutions d'apprentissage, comme les études de premier cycle.*

***Mots-clés* :** Modèle d'apprentissage hybride, Résultats d'apprentissage, Étudiants, Impact

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## Introduction

It is crucial to acknowledge that education has a role to fulfil in the growth of an individual and the economy. The acquisition of

knowledge, skills, and attitude is one major aim of education to an individual. Two primary categories of education exist: Formal and Informal Education. Education is expressed in all aspects of life; from a daughter observing the mother cook, a father teaching the son to undertake domestic menial jobs in the house to an older sibling teaching the younger to move a vehicle. The Formal Education is carried out basically through teaching and learning. Thus, there is a teacher to teach and a student to learn. This procedure requires teachers to present their lessons by using appropriate methodologies that will help students achieve academic aims or goals. Allen (1971) opines that the intent of education can be "Ultimate and Immediate" as the "ultimate" aim is similar to the self-actualisation goal or need of an individual on the Maslow's hierarchy of needs. When students' academic achievements are not sufficiently motivating, their likelihood of leaving school increases and this leads to the question of "what propels academic success among students." The "Immediate" can be said to be the basic need on the Maslow's hierarchy.

Arnaiz-Sanchez (2020) relate academic performance to teaching methodology, as various methods of teaching are available for sharing knowledge with children of school going age. Some of these teaching methods like lectures and recitations are teacher-centred as others like Problem-Based Learning are student-centred, but education has come of age where teaching and learning are demanded to be more student-centred (Brown, 2008). Student-centred learning is an educational philosophy crafted to address the unique requirements of each student. Its emphasis on granting students a voice, options, progress based on competency, and ongoing assessment of their needs are described by Bouffard (2019) as the four primary attributes of a student-centred learning all of which are evident within the blended learning approach. This approach combines conventional and computer-based classroom methods which is always student centred as described by Subramonian (2015), and the blended learning model has been proven by researchers and scholars to be one of the most useful methods of teaching or methods of imparting knowledge into students as it helps them think creatively and also develop interest in collaborative works (Resien, 2020).

The usefulness of the blended learning model has called for an investigation into this area of study. Many researchers such as Utami (2018), and Khader (2016), used the experimental design approach in looking at the best methodology between the blended and traditional mode of learning. Utilising an experimental design approach, they collectively reached the conclusion that the most effective and appropriate methodology for students is the adoption of the blended model. If the blended learning approach has been established as superior to the traditional learning mode by scholars such as Suk (2023) and Suwannaphisit et al., (2021), evaluating its impact on students' learning outcomes becomes imperative.

## Background

The education system has witnessed a massive revolution over the past decade due to the introduction of computers and other computer related programs. Early computers were people who performed complex calculations and not machines (Freeth, 2014). They were basically mathematicians and bookkeepers, and the term "computer" was used to describe that job position or title. Since the introduction of the very first computer which is the Antikythera mechanism (200 BC to 70 BC), the use of computers in education began taking various forms as archaeologist believe that the Antikythera mechanism was used to calculate eclipses and other astronomical events (Freeth, 2014).

Over the years, the concept of learning, involving the acquisition of fresh insights, knowledge, behaviours, skills, values, attitudes, and preferences, has evolved to facilitate the attainment of knowledge. Mia (2017) classified learners into four distinct groups: auditory learners, visual learners, kinesthetic learners, and tactile learners. Auditory learners excel when the subject matter is reinforced with sound. They favour absorbing information by listening to a teacher or lecturer rather than taking notes to formulate their own ideas. Visual learning style is also when learners prefer seeing and observing things. Such students understand things better when it is presented in a visual way like diagrams, pictures, and more. Conversely, kinesthetic learners also acquire knowledge by engaging in hands-on experiences or activities (Rhouma, 2016). Throughout history, cave art or the utilisation of

images for learning has stood as the earliest mode of visual communication recognised by humanity, owing to the inherent human inclination towards colours and visuals (Wright, 2010). The teaching and learning environment has gone through several evolution, and it is currently embracing innovations with technology being at the forefront. This progression commenced with the utilisation of computers, advanced to the incorporation of the internet, and has now evolved into the concept of blended learning, reliant on technology to deliver educational content to learners through efficient methodologies (Khader, 2016).

In accordance with Dangwal (2017), blended learning is elucidated as an instructional technique that merges technology and digital media with conventional instructor-led classroom engagements, affording students enhanced adaptability to personalise their learning journeys. Habib (2018) simply described it as a combination of face-to-face and online learning, and Ismail (2009) additionally portrayed blended learning as the integration of technological advancements to harmonise the two educational modes: in-person and remote education. This integration fosters interaction between educators – whether teachers, lecturers, or mentors – and learners in a face-to-face context through these innovations. Notably, these innovations do not necessitate particular electronic device or predetermined quality standards, but they do necessitate access to curriculum-connected learning resources. Berbesada (2022) also sees the blended learning model as a way of learning which is aimed at helping learners achieve the intended learning outcomes through the blending between the forms of traditional education and e-learning which happens inside and outside the classroom. Blended learning has gradually come to stay as it is regarded as one of the best and most widely used teaching methods especially in Higher Education Institutions (HEI). It became very popular especially within the Sub-Saharan African Region during a surge in the Covid-19 pandemic as it was an alternative used in teaching especially in Higher Education Institutions (HEI), and it is expected to develop problem solving skills, learning motivation, and student engagement (Rachmadtullah et al., 2020).

The emergence of computers and the internet brought about the Electronic Learning (E-Learning) which is sometimes called web-based training, and it is part and parcel of the blended learning model. The e-learning is a structured educational system supported by electronic resources, facilitating formalised instruction (Al Rawashdeh, 2021). It creates an avenue for instructional innovations and make individuals conversant with technological devices and software which provide ubiquitous learning environment as it makes use of mobile devices, web platforms and instructional software (Horton, 2002). These media space or environments also helps students gain digital literacy, digital ethics, and many others needed for effective facilitation to ensure the impact of the blended learning model on students' learning outcomes.

## Research Objectives

The specific objectives of the study are;

1. To identify the various components of the blended learning model that make it helpful to KNUST-MELS IDL.
2. To assess the advantages and challenges of the blended learning model in KNUST-MELS IDL.
3. To measure the impact of the blended learning model on students' learning outcomes.

## Research Questions

The following are the research questions of the study;

1. What are the various components of the blended learning model that make it helpful to KNUST-MELS IDL?
2. What are the advantages and challenges of the blended learning model in KNUST-MELS IDL?
3. What is the impact of the blended learning model on students' learning outcomes?

## Theoretical Frameworks

The theoretical framework of the study is based on the *Complex Adaptive Blended Learning System* and the *Community of Inquiry*.

The *Complex Adaptive Blended Learning System as proposed by* Yuping wang et al., (2015) *is a promising framework comprising of six different elements all with their sub-systems and with the learner at the centre of it all. The elements include the learner, the teacher, the technology, the content, the learning support, and the institution. Having the learner at the centre makes it more student centred like the blended learning model.*

Another theoretical framework upon which the study is built is the Community of Inquiry (COI) which was originally developed by Garrison et al., (2000). This framework in a gradual process has grown to become very useful in blended learning as it is based on the work of John Dewey, vygotsky, and constructivist views on experimental learning (Swan et al., 2009). The Community of Inquiry describes the necessary elements to create deep and meaningful learning. It as well outlines the educational experience happening at the convergence of three presences which are; cognitive presence, teaching presence, and social presence. The social presence is the ability of learners to be seen as real people as they are able to establish relationships, communicate online and offline, and project their emotions as well. Teaching presence is directly related to the facilitations making education meaningful and worthwhile. This ensures effective collaboration between teachers and students for effective facilitation. It is at this level of Community of Inquiry that the teaching is designed online and offline to engage students in collaborative constructivism. Cognitive presence is also related to the extent to which learners can construct and confirm meaning through sustained reflection and discourse. Blended learning using the Community of Inquiry (COI) creates opportunities for self reflection, interaction, and peer teaching as all these help students in their academics.

## Methodology

### Research Design

This study employs descriptive case study approach, integrated within the framework of mixed methods (qualitative and quantitative) inquiry

to comprehensively address the research questions. The nature of the study necessitated the adoption of mixed methods because it aims to take advantage of the strength of both modes. In terms of the qualitative method, the use of semi-structured questionnaire was adopted to solicit responses from all respondents. The same semi-structured questionnaires were used to extract the quantitative data for processing. The quantitative aspect of this study is simpler in nature as tables were employed, and the Mean and Standard Deviation (SD) was derived from the collected data for analysis.

## Data Collection

Information was collected from both primary and secondary sources. The primary source served as first-hand information, and total population sampling technique was employed. The researcher targeted all current MPhil Educational Innovations and Leadership Science (MELS) – Institute of Distance Learning (IDL) students at the Kwame Nkrumah University of Science and Technology (KNUST) who receive tuition via the blended learning model. Lecturers at the Institute of Distance Learning (IDL) facilitating the MPhil Educational Innovations and Leadership Science (MELS) class by means of the blended learning model were also targeted. Semi-structured questionnaires, semi-structured interviews, and observations were used in collecting the primary data. Secondary data were also sourced from specific books, journals, the internet, and pamphlets related to the project's focal theme. Acquiring secondary data through these channels facilitated access to insights from other researchers' efforts and documented articles concerning the subject matter, effectively averting redundancy.

The unstructured observation was targeted at the learning outcomes of students and class participation with the researcher being the observer (participant observation) as he was also a student of the MELS class of which all the participants being observed are coming from. Upon the researcher enrolling in the course with the notion of conducting this study on MELS distance learning students, he acted like a silent investigator and critically observed the engagement of students in both models (online and conventional in-person instruction) and how

students interact with technology. The researcher was very objective in all dealings and noted all observations down in a notebook. This observation lasted for a period of 2 academic years which is approximately 16 calendar months.

### *Semi-Structured Interview Procedures*

Semi-structured interviews were conducted online and in-person after ethics approval from the institution. Prior to the online interviews, participants were emailed or read a document highlighting the aims of the research and the conduct of the interviews. Participants were asked to sign and send back the document indicating that "go ahead" has been given for the conduct of the interview which lasted for not more than 20 minutes. The questions were as follows;

1. Share your experience in the usage of the blended learning model.
2. Comment on how the various components of the model has impacted your performance/delivery as a student/lecturer.
3. What do you think are the advantages and challenges of the model in improving students' learning outcomes?
4. Do you consider the model to be effective in improving students' learning outcomes?
5. What is the impact of the model on students learning outcomes?

***Table 1.1 Semi-Structured Questionnaire Items***

| |
|---|
| 1. Students Mode of Study for Current and Previous Academic Level |
| 2. Students Performance Ratings for Current and Previous Academic Level |
| 3. Lecturers Current Teaching Method and Preferred Teaching Method |
| 4. Most Beneficial Components of the Model |
| 5. Overall Satisfaction of the Various Components of the Model |
| 6. Advantages and Challenges of the Model |
| 7. Recalling a Time Where the Blended Learning Model Helped Students Better Understand a Challenging Topic |

**Table 1.2 Eligibility Criteria**

| Criteria |
|---|
| 1. Students of KNUST |
| 2. Lecturers of KNUST |
| 3. Distance Learning Students |
| 4. Lecturers who use the blended learning model |
| 5. Students who use the blended learning model |

***Recruiting Respondents/Sampling Frame***

The study recruited respondents using the stratified and purposive sampling technique. Stratified sampling is a probabilistic sampling method in which the researcher categorises subjects into distinct strata or groups based on shared characteristics or attributes such as age or gender (Arnab, 2017). After dividing the entire population into strata (Accra and Kumasi Campus), the researcher further randomly selects respondents proportionally from the different strata. Purposive sampling technique on the other hand is also a non-probability sampling technique that helps the researcher to select respondents suitable for the study. These two approaches were suitable for the study considering the nature of it. The construction of the sampling frame was influenced by both the research questions and the study's theoretical frameworks. A respondent's map was devised to create the sampling frame. In using the stratified sampling technique, the student respondents were divided into strata or groups based on the campus they find themselves (Accra and Kumasi Campus). The Kumasi campus was selected for the purpose of the study as the researcher had easy access to the respondents.

**Table 1.3: List of Respondents and Number of Individuals Interviewed**

| Respondents | Number of Participants |
|---|---|
| KNUST MELS-IDL Students | 20 |
| KNUST MELS-IDL Lecturers | 5 |
| Total | 25 |

## Results

### *Analysis of Research Findings*

**Findings for Objective 1:** Components of the Blended Learning Model that Make it Helpful to KNUST-MELS IDL.

**Table 1.4: Components and Most Beneficial Component of the Model**

| | Online Lecture | Face-To-Face | Interactive Multimedia | Online And Face to Face | Total |
|---|---|---|---|---|---|
| Teachers | 1 (20%) | - | 1 (20%) | 3 (60%) | 5 (100%) |
| Students | 1 (5%) | 1 (5%) | 5 (25%) | 13 (65%) | 20 (100%) |

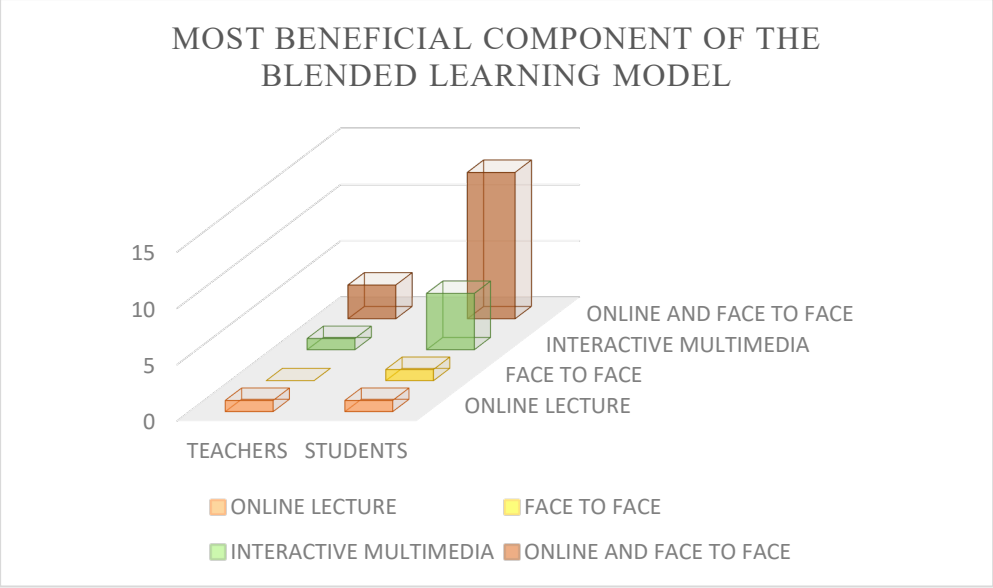
Source: Author's Field Work, June 2023

Table 1.4 revealed the components of the blended learning model that makes it helpful, and the most beneficial component of the model. The components of the model that makes it helpful are the online learning, face-to-face learning, and the interactive multimedia, but the most beneficial component of the model is the combined use of both online learning and conventional in-person instruction. 13 students representing 65% believe that the online and face to face aspect of the model have been beneficial to their distance learning, 5 of the respondents representing 25% selected the interactive multimedia as the most beneficial component of the model, and the remaining 2 student respondents selected the online (5%) and face-to-face (5%) individually. On the part of the teacher respondents, 3 of them representing 60% believe the online and face to face component of the model have been very beneficial to their teaching of distance learning students, 1 lecturer respondent representing 20% selected the interactive multimedia, and the remaining 1 respondent also selected the online component of the model.

The researcher noted that the respondents displayed a distinct preference for online classes over traditional in-person instruction. Interviews revealed that the flexibility offered by online learning made it their preferred choice. On average, approximately 15 students

attended conventional in-person classes, while around 40 students consistently participated in online lectures.

**Figure 1.1: Components and Most Beneficial Component of the Model**




Source: Field Survey Data, 2023

Figure 1.1 represents field data collected on the components of the blended learning model that makes it helpful, and the most beneficial component of the model. Observations revealed that online learning is the most beneficial component. However, during interviews, respondents highlighted both online and traditional in-person instruction as the most beneficial components, significantly enhancing their learning outcomes. Secondary sources of data collection failed to definitively identify the most beneficial component as this determination is contingent upon various factors including student needs and the specific academic program.

**Table 1.5: Overall Satisfaction of the Various Components of the Blended Learning Model**

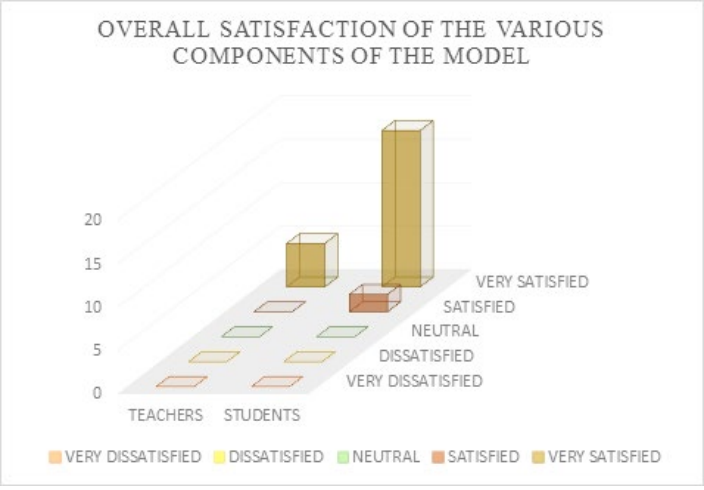
| | Very Dissatisfied | Dissatisfied | Neutral | Satisfied | Very Satisfied | Total |
|---|---|---|---|---|---|---|
| Teachers | | | | | 5 (100%) | 5 (100%) |
| Students | | | | 2 (10%) | 18 (90%) | 20 (100%) |

Source: Author's Field Work, June 2023

Table 1.5 revealed the overall satisfaction of respondents on the various component of the model, and they are very satisfied with the results on the various components of the model on their learning outcomes.

In an interview, a respondent disclosed that he has the internet at his disposal to improve understanding if he finds anything challenging. The researcher furthermore observed active discussions and collaborations in the online and conventional in-person discussions.

**Figure 1.2: Overall Satisfaction of the Various Component of the Model**




Source: Field Survey Data, 2023

Figure 1.2 represents data collected on the field on the overall satisfaction of the various components of the model. This chart is to ensure understanding of the results to all and sundry.

**Findings for Objective 2:** Advantages and Challenges of the Blended Learning Model

**Table 1.6 Advantages and Challenges of the Model**

| ADVANTAGES AND CHALLENGES |
|---|
| ***Advantages*** |
| Flexibility |
| Recorded Videos after Lectures |
| Time and Money Management |
| Opportunity to Research Over the Network |
| |
| ***Challenges*** |
| Network Challenge/Poor Network |
| Unlimited Time per Session |
| Poor Attention from Lecturers |

Source: Author's Field Work, June 2023

Table 1.6 provides a summary of the benefit and difficulties associated with the blended model as perceived by respondents. Respondents believe the model has some advantages which have helped in making it successful while some believe it has failed to achieve its success due to the challenges around it. Some of the advantages of the model according to the respondents include its flexibility, availability of recorded videos after lectures, management of time and money, and opportunity to research over the internet.

The challenges listed by respondents include poor network, unlimited time per session, and poor attention from lecturers. It was confirmed through interviews and observations that the advantages outweigh the challenges and for that matter has been helpful in the learning outcome of students.

**Findings for Objective 3:** Measuring the Impact of the Blended Learning Model on Students' Learning Outcomes.

The impact can be measured in terms of how the model helped respondents to better understand a challenging topic and by comparing it to the traditional face to face.

**Recalling a Time Where the Blended Learning Model Helped Respondents to Better Understand a Challenging Topic**

The respondents registered for about twelve courses in their MELS program for a period of two years, and almost all the respondents could recall a time where the blended model aided in their understanding of a particular topic to improve their learning outcomes. The MELS program is related to educational leadership and all the responses from respondents have been coded by the researcher and expressed in simple terms.

The topic at hand was related to leadership and it aimed to find out if "Leaders are Born or Made." This is a challenging topic or question that even the most adept minds can find challenging. The blended model became a solution in understanding this hard nut to crack as the respondents embarked of this intellectual journey seeking understanding.

The online component of the model allowed respondents to submerge themselves with interactive simulations and useful videos. Videos were played on the life or journey of two great African leaders; Osagyefo Dr Kwame Nkrumah and Nelson Mandela for respondents to decide if great leaders are indeed born or made. The flexibility to make use of the online component at one's favourable pace created an opportune moment for respondents to keep researching until they find the answers they seek.

The in-person component of the model also created a platform for discussion and interaction. Here, the respondents could put the question they find challenging before the class, engage in collaborated problem solving under the guidance of a lecturer for students to find the needed answers. The topic which posed as a hard nut to crack became understandable to all students thereby improving their learning outcomes.

Learning outcomes are measurable statements used to articulate what students should know at the outset of a course, and this was stated at the beginning by the lecturer. The respondents confirmed in the interview to have achieved all learning outcomes that was expressed at the beginning, and this was also confirmed by the researcher through observations.

**Using the Mean (M) and Standard Deviation (SD) of Respondents Using the Traditional Face to Face in their Previous Level of Education and the Blended Learning Model in their Current Level of Education to Determine the Most Impactful Model Among the Two**

**Table 1.7: Performance Rating of Respondents in their Previous and Current Level**

| VARIABLES | PERFORMANCE RATINGS | M | SD | FREQUENCY |
|---|---|---|---|---|
| Performance Ratings (Current Program) | 3<br>4<br>5 | 4.0 | 0.795 | 6 ( 30%)<br>8 ( 40%)<br>6 ( 30%) |
| Performance Ratings (Previous Program) | 3<br>4<br>5 | 4.10 | 0.852 | 6 ( 30%)<br>6 ( 30%)<br>8 ( 40%) |

**Table 1.8: Using Mean (M) and Standard Deviation (SD) to Determine the Most Impactful Model Between the Blended Learning and the Conventional In-Person Instruction.**

| PREVIOUS LEVEL OF EDUCATION (UNDERGRADUATE) | CURRENT LEVEL OF EDUCATION (POSTGRADUATE - MPHIL) |
|---|---|
| MEAN = 4.10<br>STANDARD DEVIATION = 0.852 | MEAN = 4.0<br>STANDARD DEVIATION = 0.795 |
| ANALYSIS 1 (MEAN)<br>Mean represents the average value. A higher mean indicates better performance. It can be said that the students performed well in this level of education. | ANALYSIS 1 (MEAN)<br>Mean represents the average value. A higher mean indicates better performance. It can be said that the students performed poorly in this level of education. |
| ANALYSIS 2 (SD)<br>A smaller SD signifies a more consistent performance, and vice versa. It can be said that the students performed poorly in this level of education. | ANALYSIS 2 (SD)<br>A smaller SD signifies a more consistent performance, and vice versa. It can be said that the students performed well in this level of education. |

## Discussions

The study provides evidence on the impact of the blended model on students' learning outcomes. It aimed to guide the Kwame Nkrumah University of Science and Technology and other tertiary institutions to invest in the model for its utmost benefit as it has proven useful over the years in terms of students' learning outcomes.

Investigations on the components of the blended model that makes it helpful to KNUST-MELS IDL revealed that online learning, face to face, and interactive multimedia (videos, simulations, and quizzes) are all components of the model but using both the online and traditional face to face system was found to be the most beneficial component. Likewise, it is reported in the related literature that the component of the model is an embodiment of conventional in-person and online

learning (Habib, 2018; Dangwal, 2017). A study by Olejarczuk (2013) shows that students exhibit positive attitudes to a combination of online and conventional in-person approach. This is in direct response to the "Complex Adaptive Blended Learning System" which is one of the theoretical frameworks of the study. In a Complex Adaptive Blended Learning System, the integration of online learning, face-to-face lectures, and interactive multimedia creates a dynamic and adaptive learning environment. Each component can respond to student progress and needs which is a key characteristic of complex adaptive systems.

An investigation into the advantages and challenges of the blended model in improving students' learning outcomes revealed that issues like flexibility in the use of the model, recorded videos being available, time management, and opportunity to research over the network are some of the advantages, and these advantages influenced the success of the blended model. Network challenges, unlimited time, and poor attention from lecturers are also some of the challenges of the model, and these challenges act as a stumbling block to the model in achieving its aims. Blended learning enables students to gain the needed digital literacy which is an advantage in a world of technological advancement as elaborated in the literature (Horton, 2002). Scholars like (Caulfield, 2011; Glazer, 2011) also speak on the flexibility conferred on students in the blended learning environment as expressed in the literature. The community of inquiry which emphasises on three presences which are social, cognitive, and teaching presence is more aligned with the advantages of the blended learning model in terms of building collaborative learning which is the hallmark of blended learning.

Furthermore, in measuring the impact of the model on students' learning outcomes, the study found out that the blended model helped students to better understand topics they found difficult as expressed in the literature. It is for this reason that Shannon Tabaldo who is a Digital Curricula and Instruction expert predicted the blended model to be a very good teacher (Akai, 2022).

Feedback from one of the students suggest that she had issues in understanding a topic under a course named "Management of Pre-

Tertiary Education." The blended learning model was able to improve her understanding by seeking explanation from colleagues through the "zoom" platform which is an online component of the model. During the discussion, she resorted to the internet to watch some videos and read a few articles to improve her understanding. Colleagues also sent her links to useful videos and articles through the online platform used for the discussion. A face-to-face lecture was scheduled the following week, and during that session, she had the opportunity to present some few challenges faced to the lecturer, and the entire class deliberated upon it for her to have the needed understanding.

Finally, in measuring the impact of the blended model by using the mean and standard deviation from their current (employing the blended learning model) and previous (employed the traditional face to face) level of education. The study found that the mean and standard deviation of the academic performance from their previous level of education stands at 4.10 and 0.852 respectively, and the mean and standard deviation of the performance for their current level of education is 4.0 and 0.795 respectively. Mean represents the average value of academic performance for each group (current and previous) and the standard deviation quantifies the extent to which data points deviate or diverge from the mean value. Since the mean represents the average value, a higher mean indicates better performance so it can be said that the students performed better in their previous level of education (Mean: 4.10) compared to their current level of education (Mean: 4.0). Given that the disparity in "Mean" alone may not offer a comprehensive understanding of students' academic performance, the study also examines the standard deviation values. A smaller standard deviation signifies that the data points are closely clustered around the mean, implying a more consistent performance. Conversely, a larger standard deviation indicates greater variability in performance or less consistent. Since the standard deviation of the current performance (0.795) is smaller than the standard deviation of the previous performance (0.852), it suggests that students' current performance is more consistent compared to their previous performance or their current performance is better than their previous academic performance. A study by Feiler et al., (2016) also measured the effect of blended learning by using a test of understanding in Economics.

Respondents were divided into two groups with one group using the conventional In-Person instruction and the other using blended learning. It was concluded that students in the blended learning class improved more than those in the traditional face-to-face class.

## Conclusion

The study concludes that the component of the model includes online learning, conventional in-person, and interactive multimedia but the most beneficial component of the blended model is the combined use of online and traditional face to face.

The study furthermore concludes that there are factors that influence the success of the blended model as other factors do inhibit its success. Challenges of the model include poor network, unlimited time for studies and poor attention from lecturers. The advantages on the other hand include its flexibility, opportunity to research over the internet, and the availability of recorded videos.

The study finally concludes that the impact of the blended model can be measured with how the model helps students understand difficult topics, and by comparing it to the conventional in-person instruction. In comparing both models, it can be inferred that the blended model and the conventional in-person instruction contribute to enhancing students' learning outcomes. Nevertheless, the blended learning model appears to exhibit a greater level of effectiveness when compared to the conventional in-person instruction considering the range attained by the blended model when the standard deviation was used in assessing the most impactful model between the two methodologies. When the current academic performance of the student respondents was compared to the academic performance of their previous level of education by using the mean, the researcher observed that the students performed well in their previous level of education which employed the traditional face to face than their current level of education employing the blended learning model.

The same comparison was done a second time by using the standard deviation, and this time the students performed better in their current

level of education employing the blended learning model than their previous level of education which employed the conventional in-person instruction. The range used by the blended learning model in being successful than the traditional mode when standard deviation was used supersedes the range used by the conventional in-person instruction in being successful than the blended learning model when the mean mark was used. This simply leads to a conclusion that the blended learning model impacts more on student's learning outcomes than the conventional in-person instruction.

## Recommendations

The study recommends that the school conducts a baseline assessment of teachers and students' ICT skills to gauge their current proficiency levels since the blended learning requires some basic level of technological competency. This can be done through surveys, or practical assessments that evaluate their familiarity and competence with basic ICT tools such as word processing, presentation software, and communication tools (video and audio platforms). It furthermore recommends that the school provides opportunities for students and teachers to have hands-on practice with the ICT tools relevant to the blended model. This can include practical exercises, projects, or assignments that require the use of specific tools.

The study recommends the introduction of the blended model in Senior High Schools due to its impact. It has been observed that the model is only used in tertiary institutions. Students using it at an early stage of their academic life will help build their capacity in the use of the model by the time they advance to tertiary, and this will in the long run help improve their learning outcomes.

Currently, the Ghanaian education has been structured in a manner that Senior High School students sometimes spend more than a month home during vacation. As it stands, teachers can engage their students during long breaks as such by using the blended model.

Regarding the components of the model, the study recommends that special attention should be given to both the online system and the

traditional face-to-face aspect of the model as this is the most beneficial component of the model. It has been observed in recent times that many facilitators do pay much attention to the online aspect of the model without putting the conventional in-person instruction into consideration. However, this diminishes its efficacy and shifts it away from being a true blended model, which relies on the amalgamation of both conventional in-person instruction and online teaching methods.

Poor internet connectivity is a major challenge for the model. The student respondents expressed in the interviews that the school has provided them with sim cards of which they get a monthly allocated data bundle, but this is not a solution to the internet connectivity issues at hand. Challenges related to internet connectivity pose a concern for numerous students across the country. Many students voice their dissatisfaction with distance learning due to the lack of a dependable internet connection, especially for synchronous courses.

Solving this major problem will contribute to the impact of the blended learning model, so the study recommends "speedify" as the solution to distance learning challenges for students and teachers. Speedify is a software application that can be installed on a device for online classes. It is a bonding Virtual Private Network (VPN) that allows users to use all their internet connections at once to help get a fast and reliable internet connection. "Speedify" uses a technology called channel bonding, and this technology allows you to stay online even if one of the connections drops. Aside from the monthly allocation of data, the school's management can invest in "Speedify" to help reduce the problem of internet connectivity in distance learning.

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# Enhancing Access and Quality of Open Instructional Videos in Africa: Visibility of NOUN Repository on Social Media

# Améliorer l'Accès et la Qualité des Vidéos Pédagogiques Ouvertes en Afrique: Visibilité du Référentiel de la NOUN sur les Médias Sociaux

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## Abstract

*National Open University of Nigeria (NOUN) open courseware has been adjudged a source of dependable open educational resources for students and instructors within and outside the ambit of open and distant learning institutions across African sub-region and beyond. The development of instructional videos, produced by professional in every subject area in NOUN has added significant values to open learning resources. Opening the instructional videos to unrestricted access particularly through social media has been a subject of debate considering the public request and the university's need to protect the integrity of the videos. Although, social media especially YouTube house both open and restricted access instructional videos, doubtful sources and questionable contents have made its adoption for open universal education a prolonged challenge. This work surveyed public opinions within and outside Nigeria on how social media could enhance the openness of NOUN's instructional videos and boost the users' trust in the contents on social media. Hanging the discussions on Uses and Gratification theoretical analysis, transporting NOUN instructional videos to social media was adjudged a welcomed development. Substantial empirical deductions from public perceptions of the idea affirmed that the practice would lubricate the public interests and confidence in open and distant education.*

***Keywords*:** Instructional video, Open resources, Social media, Repository, Courseware

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**Résumé**

*Les didacticiels ouverts de National Open University of Nigeria (NOUN) ont été considérés comme une source de ressources éducatives ouvertes fiables pour les étudiants et les instructeurs à l'intérieur et à l'extérieur du cadre des établissements d'enseignement ouverts et à distance dans la sous-région africaine et au-delà. Le développement de vidéos pédagogiques, produites par des professionnels dans chaque domaine de NOUN, a ajouté des valeurs significatives aux ressources d'apprentissage ouvertes. L'ouverture des vidéos pédagogiques à un accès illimité, notamment via les réseaux sociaux, a fait l'objet de débats compte tenu de la demande du public et de la nécessité pour l'Université de protéger l'intégrité des vidéos. Bien que les médias sociaux, en particulier YouTube, hébergent des vidéos pédagogiques à accès libre et restreint, leurs sources et leurs contenus douteux ont fait de leur adoption pour l'éducation universelle ouverte un défi prolongé. Ce travail a interrogé l'opinion publique au Nigéria et à l'étranger sur la manière dont les médias sociaux pourraient améliorer l'ouverture des vidéos pédagogiques de NOUN et renforcer la confiance des utilisateurs dans le contenu des médias sociaux. En se basant sur l'analyse théorique de l'utilisation et de la gratification, le transport des vidéos pédagogiques du NOUN vers les médias sociaux a été considéré comme un développement positif. Des déductions empiriques substantielles des perceptions du public de l'idée ont affirmé que la pratique lubrifierait les intérêts et la confiance du public dans l'éducation ouverte et à distance.*

***Mots-clés*** **:** vidéo pédagogique, ressources ouvertes, médias sociaux, référentiel, didacticiels.

## Introduction

Enhanced interactivity of open and distance model of education has placed more pressure on the demand for innovations to enhance access especially among the educationally disadvantaged and the less privileged in Africa (Adelakun, 2018). This achievement speeds up the central target of Massive Open Online Course (MOOC) and various governmental policies on mass education of African population. Various developments in information and communication technologies (ICTs) are also easing both the access and the mode of transferring knowledge without distance barriers. The development in ICTs has also cut up with the interactivity challenge, which was earlier

considered one of the main obstacles in open and distance education compare to face-to-face classroom affairs. The influence of technological determinism proposition has proved a significant trend in the way every development in information and communication technology benefits open and distance education. Social media are now rendering significant functions in education and knowledge sharing and have been widely adopted as means of facilitating access to unrestricted educational contents (Essel, Vlachopoulos, Adom, & Tachie-Menson, 2021; Olivier, 2019; Ssentamu et al., 2020).

Many institutions in Africa like their counterparts in other continents were forced by the challenge of Covid-19 to engage in distance education in the year 2020 and 2021 so as to maintain social distancing health measure and to avoid disrupted academic calendars (Adelakun, Aliede, Enwerem, Ambassador-Brikins, & Abutu, 2020). This trend reinstates the relevance of social media in educational engagement and how it mandated teachers and students not only to keep abreast of the development in ICTs but also to seek knowledge of their usage for open and distance educational purposes. The trend also celebrates National Open University of Nigeria (NOUN) courseware repository as open educational resources, where reading course materials can be freely accessed by the educators and students to facilitate distance educational demand for post-secondary education levels. Virtual classes on Zoom, Microsoft Team, Google Classroom and many others keep enticing the interests of learners in virtual education system as the level of interactivity with the tutors is almost equal to face-to-face classroom affairs. All these technologically-induced developments in education has increased the number of school enrolments, enhanced continuous education, lifelong learning, and consolidated the traditional learning approach that fosters coordinated and robust academic curriculum (Beldarrain, 2006; Chaka, 2020; Muhirwa, 2009).

The Introduction of instructional video as a subtle means of educational delivery scuttles the issue of inconvenient class schedules in the interactive virtual classes (Chan, 2010). Though less interactive compared to physical classes, studies (Mayer, Fiorella, & Stull, 2020; Tang, Lu, & Zhou, 2020; Zhang, Zhou, Briggs, & Nunamaker Jr, 2006) have attributed the high rate of virtual class adoption to convenience

and conformity to personal schedules and the learner's control over what, when, where, and which scene of the instructional video to watch. These, in addition to the opportunity to fast-forward the contents to avoid the redundant scenes; rewind it to grasp the interesting aspects or for emphases purpose; and watch over and over again until the messages are grabbed, alluring to the audience of instructional video stand out the medium for educational use. Studies (Hibbert, 2014; Lee & Mayer, 2018; Zhang et al., 2006) also affirmed that instructional videos meet the educational needs of the non-traditional students, professionals, artisans and the international students who are not within the radius of the learning environment. Though the instructional videos on social media particularly YouTube are educational inclined, their contents are not produced based on specific curriculum or subjected to professional gauges in each area of expertise. Uploading of instructional videos on social media is opened to all social media users thereby questioning the quality, standard, originality, as well as the relevance or palatability of the contents to the actual and potential users.

Based on the submissions of some studies (Adelakun, 2018; Adeoye, 2020), the use of social media for academic and research purposes is fast growing and the volume of educational contents presently on social media buttresses the submission that social media have become vital education resources highly depended on by all partakers in educational activities. Although studies on social media relevance in education have been able to establish the growing rate of reliance on it for educational drives, the attention of the studies on the degree of credibility that such contents demand from the users to ensure confidence while applying the knowledge embodied in the contents to the society is not considerably established. There are certain research gaps in the relationship between the volume of the educational contents on social media and the trust the educationalists repose in the academic contents of the instructional videos. Restraining NOUN instructional video contents to the university repository may result to limited exposure to the potential beneficiaries. The challenge is how secure and credible are the contents when made open on social media particularly YouTube and what degree of trust would educationalists have in it to beef up the knowledge gap and align it with academic

curriculum at various level of post-secondary education ? Will the users be able to distinguish the quality, standard and the originality of the NOUN instructional videos on social media from others that were not subjected to academic and research rigours? Will they be able to accord the trust that the NOUN instructional videos deserve when the contents are housed on social media together with others of doubtful sources?

## Social Media Adoption and usage trends in Africa

It is empirically documented that social media use in Africa is not evenly distributed among different categories of age groups (Whiting & Williams, 2013). The statistics from substantial number of studies skewed in favour of the digital natives – the middle age group, who are most often regarded as the youths. The skewness of the data, which substantiate high level of social media adoption and use among the African youths is a plus to any study on the adoption of the media for educational purpose. The vantage steps out of the fact that the bulk of the social media users in Africa as documented in Adelakun (2018) are school-age group who may find favour in using the media for knowledge sourcing and sharing purposes. Although, the concept of school-age population requires clarification as the age parameter is no more a distinctive characteristic for the classification. The concept is becoming cloudy as continuous and lifelong education through Open & Distance Learning (ODL) system entices even the adults and the aged population into convenient schooling. The digital-immigrant category who majorly depends on traditional news media are always struggling to come out of the laggard category in the hierarchical level of adoption of the new media especially when the needs transcend news purpose. This category rather places their media priority on the primary motives for using media, which are information and news value and they found their needs gratified with traditional news media.

Social media adoption and usage is exponentially growing by the day in Nigeria. Empirical evidences (Adelakun**,** Ademuyiwa & Oyebode, 2021) attribute the incessant increment in social media use in Nigeria to the rediscovery of the media as the most potent avenue for political campaigns. The study hypothesised and empirically justified a steady

increment in social media use for political purposes from 2011 when Twitter was first used by one of the presidential aspirants to declare his intention to contest. After 2011 general election, politicians and their allies hijacked social media, most especially Facebook as the cheapest means to reach out to their target audiences, who are majorly the electorates (Adelakun, 2018). Until the beginning of Covid-19, the use of social media for educational objectives was at low ebb. YouTube contents prior Covid-19 was infested with films and comedy presentation series. YouTube played host to insignificant proportion of educational videos of indigenous contents before Covid-19. The contents were not only made outside Nigeria but also not made by Nigerians. During Covid-19, academic lectures were uploaded on social media to enhance virtual learning. But the effort to streamline the contents to ensure originality so as to protect copyright; standard to maintain learning per excellence; relevance to avoid misleading knowledge; and credibility to maintain consumer trust, remains a big challenge. Any attempt to gate-keep educational videos that are uploaded online is considered an infringement on the right to information and freedom of communication as entrenched in the international human right declaration.

There is high similarity in the trends of social media adoption, subscription and use between Ghana and Nigeria. Studies confirmed that more Ghanaians are not only subscribing to social media but also using the platform heavily particularly for health information since the beginning of Covid-19. This makes Covid-19 a significant factor that prompted more subscription on social media for educational task. No specific empirical deduction attributed the use of social media for education objective to Covid-19 in Ghana could be cited in this work. But studies (Beldarrain, 2006; Essel, Vlachopoulos, Adom, & Tachie-Menson, 2021; and Zhang, Zhou, Briggs, & Nunamaker Jr, 2006) relate the adoption of virtual learning environment by many higher institutions of learning in Ghana to more engagement of social media in facilitating learning. The case is similar in Uganda and South-Africa where the adoption of social media for education purposes was sped up by Covid-19 experience Ssentamu, et al., 2020).

## The Place of Instructional Video in Online and Distant Education in Africa

The relevance of instructional video to learning is enhanced by the audio-visual and motion advantage it offers. It has almost all the characteristics of a classroom setting except limited interactivity between the instructor and the learners. One great opportunity of instructional video as noted in Hibbert (2014) is that it accommodates unlimited number of students. Just like any of the mass media, instructional video can serve unlimited heterogeneous dispersed students at the same time. Another functional benefit of the educational medium that surpasses conventional broadcast media is that the contents can be accessed, revisited, downloaded, and shared to other consumers in other to enhance its visibility. It can also be reproduced as video-within video to substantiate or as a reference material in a related online lecture or another similar instructional video (Mayer et al., 2020; Tang et al., 2020).

The fact that most instructional video are uploaded online free and are characterised with unlimited access make it a viable and cost-effective means of spreading knowledge. Studies confirmed that those who live below poverty line and the educational less privileged found the medium of education more accessible, affordable, and as such fill the gap of their unique educational deficiencies (Fiorella & Mayer, 2018; Lee & Mayer, 2018). In most African educational settings especially in Nigeria where industrial strike actions have reduced the public higher institutions of learning to an effigy of their past glories and a compromising avenue to create market share for the private higher institutions, opportunity for higher education has become unattainable dream for the common man. The hope of those who could not afford education at higher cost in private tertiary institutions rises in open and distance online education where the mode of learning largely depends on online classroom and instructional video structure. Through instructional video, learners are at the liberty to select from numerous online lectures on specific topics that cover the areas of their academic or research interest.

Instructional video also paves ways for laboratory and industrial practical for learners and institutions. Practical-oriented lectures and technical practices are demonstrated on some instructional video contents to keep online learners abreast of the standard practice in well-equipped laboratories or engineering workshops in conventional universities. Universality of education curriculum as well as international standard practices and structures are enhanced through instructional video contents. Studies (Chan, 2010; Kristanto & Mariono, 2017; Mayer, 2017) document the incessant increase in the statistical ratio of conventional university students who use instructional videos not only as alternative education sources but also for the consolidation of knowledge received and the filling of knowledge gaps. Researches have also confirmed high dependency ratio on instruction video by the lecturers in higher institutions of learning for knowledge updating, to compared methods and modes of teaching, and for the adoption of the new techniques of engaging students in standard learning processes.

## Instructional Video on Social Media: Uses and Gratification Theoretical Perspective

The issue of how beneficial the consumers of instructional video find the contents on social media is a function of the level of convenience in its accessibility, usage, and the degree of satisfaction they derive from its consumption. Experimentation and application of uses and gratification proposition in studies related to the media use and the satisfaction that the media audience derive from such use often confirms why people can't do without the media. The primary roles of the mass media and the needs that the media audience desire to be gratified from the media, which studies summarised as information, education, entertainment, and merchandising corroborate some of the media effect theoretical propositions and models. Hence, the speculations and the unverified hypothesis is that instructional videos perform the same roles and gratify certain needs of the media audience just like conventional and other new media. All these explain why discussions and empirical justifications of instructional video contents and usage be subjected to uses and gratification theoretical explanation.

Uses and gratification theory, propounded by Blumber & Katz's (1974) explains the nature of the bound between the media and the media audience, which is the message. Media audience are the consumers of what the media produce and the media messages are the products that the mass media offer to the audience. Economics theory of utility proves that consumers of a product will consume more as long as the product satisfies consumers' needs. This buttresses the reason why the audience patronise the media, that is, to satisfy their needs. The needs that the media audience put forwards define the roles that the media perform in a society. Indeed, as the media audience's needs become expanded, the media must adjust its roles to meet the new demand. This also explains the concepts of media selectivity and preference. The needs of the media audience vary and that defines various medial roles, hence some media houses specialised on each of the audience needs to ensure utility.

It has been hypothesised that the needs that the audience of the instructional video bade to gratify lies within the roles of the medium. The essence of engaging uses and gratification theory to discuss the media and audience relationships under this media structure is to compare and confirm the degree of satisfaction that the audience of instructional video derive from instructional video contents of unknown sources and those from the professional or university repository alternative sources. The usage of social media in open and distant learning alternative was confirmed and back by uses and gratification theoretical proposition in Adelakun, (2018). The empirical discussion in the work attuned to the essence of engaging the uses and gratification theory in understanding social media audience needs to be gratified and how media contents are selectively consumed to satisfy the needs. Similarly, the interest of the instructional video audience and the needs for the content in gratifying their academic purpose buttresses the adoption of the theory in understanding usage and needs gratification proposition. The theory further explains the audience preference between accessing instructional video contents through university repositories or social media. Considering this theoretical perspective of needs gratification, opening NOUN instructional videos on social media demand a serious consideration.

## Methods

This study adopted mixed method in research designs (survey and interview), data generation instruments (questionnaire and interview) and data analysis procedures (quantitative and qualitative). Survey design was adopted to sample the opinions of various audiences of instructional video among social media users in Nigeria and in three other Anglophone African countries that were randomly selected. The questionnaire respondents are limited to the social media users among NOUN students and students of conventional universities in the selected countries, who use NOUN repository in search of instructional materials for education purpose. Considering the objective of this work, heterogeneity, and unequal access and digital versatility characteristics of the respondents, three different data gathering instruments were adopted. The respondents constitute NOUN students and students of other institutions in the sampled Anglophone African countries, who access or subscribe to NOUN open repository for educational and instructional materials. The details and the email contacts of the respondents were accessed through their online presence on NOUN repository through reads and downloads statistics on the repository. Online questionnaire was administered on the respondents, who use NOUN educational contents. In-depth interview was conducted to elicit responses from NOUN management on the university position whether or not to give open access to her instructional video contents on social media just like the instructional reading materials (Course Materials). Considering the multiplicity of the characteristics of the instructional video audiences and the level of acceptability of the open and online education, half of the respondents were selected from students of ODL and conventional universities who visit NOUN repository for educational materials.

The population of the study was configured on the users of NOUN online educational materials which was determined by the statistic of the users' presence on NOUN repository by ODL/conventional university students. It was impossible to separate ODL students from conventional university students on NOUN repository except through their response to the variable that addresses this attribute in the administered questionnaire. Considering the inaccuracy of the

population of subscribers to NOUN repository due to repetitiveness of online presence of some respondents, and unstable in the frequency of visits to the repository, the population was based on the statistics of the visit to repository within the specific period covered by this study (July to October, 2022). The population of the users of NOUN repository was therefore approximated to one million students, which speaks volume of its uncelebrated level of adoption and students' level of the digital compliance in some part of Africa. Using Taro Yamane formula ($n = N/1+N\ (e)^2$), The sample proportion of the respondents, who subscribe to NOUN repository to access online educational materials amount to 400. The sample of the respondents were randomly picked evenly from the four-month strata. In-depth interview was conducted with the Directorate of Learning Content Management of NOUN, who manage NOUN repository. More online questionnaires than required number were sent out from which those that corresponded with the specific characteristics of the target respondents such as studentship and educational purpose, (which is the focus of this study) were selected. The links of NOUN repository audience were got through their comments on the educational material contents on NOUN repository and that made it easy to send online questionnaire links across to all the chosen 400 digital-native respondents.

Survey responses were quantitatively analysed through the use Statistics Package for Social Sciences (SPSS) tool and summarised on frequency distribution tables. Interview responses were discussed in relation to the appropriate research question.

## Data Presentation and Discussion

The two sets of data generated were used to respond to the research questions earlier raised. The opinion sample poll was subjected to quantitative analysis to establish how the instruction video users relate with the contents in term of usage pattern, the degree of satisfaction derived and further needs.

## Demographic Distribution of the Respondents

Table 1: Demographic distributions of the respondents

| Variables | Frequency | Valid%) | Cumulative % |
|---|---|---|---|
| **Institution** | | | |
| **NOUN** | 128 | 37.91 | 37.91 |
| **Other University in Nigeria** | 72 | 32.57 | 70.48 |
| **Universities outside Nigeria** | 200 | 29.52 | 100.0 |
| **Total** | **400** | **100.0** | |
| | | | |
| **Institutional structure** | | | |
| **ODL Universities** | 252 | 63.00 | 50.00 |
| **Conventional University** | 148 | 37.00 | 100.00 |
| **Total** | **400** | **100.0** | |
| | | | |
| **Age Distributions** | | | |
| **Below 18** | 72 | 18.00 | 18.00 |
| **18 – 38 Years** | 272 | 68.18 | 60.18 |
| **39 – 59 Years** | 56 | 14.42 | 91.60 |
| **60 Years & above** | 0 | 0.00 | 100.0 |
| **Total** | **400** | **100.0** | |
| | | | |
| **Gender Distributions** | | | |
| **Male** | 224 | 56.00 | 56.00 |
| **Female** | 176 | 44.00 | 100.0 |
| **Total** | **400** | **100.0** | |

Factors such as level of digital literacy and the degree of access to digital compliance tools influence the frequency of the demographic variables as presented in Table 1. Considering the large population of NOUN students and the online mode system of education adopted, the level of digital literacy as well as the rate of online presence and search for education instructional materials were mostly justified in the statistics of NOUN repository subscribers. Since there is no discrimination in term of privilege to access NOUN repository between

NOUN students and students of other universities, access to the repository can therefore not constitute a moderating variable in this essence as the open access to the repository is an even privilege to all. The normal curve structure in the age distributions of the respondents is a clear picture of the age range of the university undergraduates in most West-African countries with the results in West-African Examination Council and common educational system as moderating factors (Okagbue et al., 2020). The dominant age range in the distributions, which can be regarded as the youth category has been empirically proved as the most active online (Adelakun & Oyebode, 2021). Invariably, most of the students within this age category are regarded as the digital native generation because of their activeness in the manipulation of the digital compliance tools in search of education instructional materials in virtual environment (Adelakun, 2018b). The gender structure of the distributions is also a reflection of the ratio of male to female undergraduate students in some universities in West-African sub region (Okagbue et al., 2020).

Q1: **What is the usage pattern of education instructional materials by the subscribers of NOUN repository**

Table 2: Five-Point Likert Scale distributions of the usage pattern of NOUN repository by the university's undergraduates

| **Users' assessment of Instructional video** | **Sample Size** | **Construct Structure** | **Max** | **Min** | **Mean** | **Decision rule** |
|---|---|---|---|---|---|---|
| Access to digitally compliance tools to access NOUN repository | 400 | Positive | 5 | 1 | 4.97 | Favourable |
| Frequency of visit to NOUN repository for education instructional materials | 400 | Positive | 5 | 1 | 3.82 | Favourable |

| Users' assessment of Instructional video | Sample Size | Construct Structure | Max | Min | Mean | Decision rule |
|---|---|---|---|---|---|---|
| Access to education instructional materials on NOUN repository | 400 | Positive | 5 | 1 | 4.58 | Favourable |
| Usage of NOUN repository for educational purpose | 400 | Positive | 5 | 1 | 4.63 | Favourable |

*A positively structured construct + above 3.0 mean = Favourable, and vice versa

*A negatively structured construct + above 3.0 mean = Unfavourable, and vice versa

Access to digitally compliance technological appliances such has hand phones and computer among the undergraduates is relative to the financial capacity and priority on their scale of preference. The access structure among NOUN students is more lubricated considering the compelling ODL education system. The large number of the digital native students who constituted the bulk of the respondents is another factor that influences the degree of access to the digitally compliance tools to access NOUN repository. Frequency of visit to NOUN repository for education instructional materials is on average level. While NOUN students visit the repository often, others do only when the need arises. The purpose of visiting the repository which is to access education instructional materials is uniform among the categories of students and the aggregate usage of the repository is for educational purpose without exception among the categories of the students.

Q2: **What is the users 'assessment of educational instructional video?**

Table 1: Five-Point Likert Scale distributions of the users' assessment of educational instructional video contents

| **Users' assessment of Instructional video** | **Sample Size** | **Construct Structure** | **Max** | **Min** | **Mean** | **Decision rule** |
|---|---|---|---|---|---|---|
| Awareness of educational instructional video | 400 | Positive | 5 | 1 | 4.87 | Favourable |
| Access to instructional video contents on NOUN repository | 400 | Positive | 5 | 1 | 2.82 | Unfavourable |
| Access to instructional video contents on social media | 400 | Positive | 5 | 1 | 3.43 | Favourable |
| Frequency of educational instructional video usage | 400 | Positive | 5 | 1 | 3.35 | Favourable |
| Relevance of educational instructional video contents to users' educational needs | 400 | Positive | 5 | 1 | 3.89 | Favourable |
| Degree of satisfactions the users derived from instructional video contents on social media | 400 | Positive | 5 | 1 | 3.74 | Favourable |
| Needs for Open access to NOUN instructional videos | 400 | Positive | 5 | 1 | 4.74 | Favourable |

*A positively structured construct + above 3.0 mean = Favourable, and vice versa

*A negatively structured construct + above 3.0 mean = Unfavourable, and vice versa

The distributions of the survey variables as presented in Table 2 show the aggregate perceptions of instructional video users. The statistics indicates that the awareness of educational instructional video is the variable that recorded highest mean value. Considering the decision rule, the level of awareness was more favourable to the educational instruction video contents on social media which various studies considered of unknown or contending sources most especially among the non-ODL subscribers than those that are housed within the university repositories (See Table 2). Access to instructional video contents on NOUN repository was not favourably assessed. The shortfall could be attributed to the limited access to the repository unlike those that enjoy open access on social media. Contrarily, the variable on the access to instructional video contents on social media was favourably adjudged with a 3.5 mean value. This confirmed the openness of many of the instruction video contents on social media to public domain and corresponds with the demand for the NOUN instructional video to be uploaded on social media to ensure unrestricted access.

High usage rate of educational instructional video were recorded among the respondents with 3.35 mean value. The usage rate indicates that the interest in instructional video contents is not a monopoly of the subscribers from ODL institutions but rather a beneficial platform to all who want acquire knowledge or skills beyond face-to-face physical interaction. The respondents also confirmed that educational instructional video contents are highly relevant and address the needs for which they engage the medium. This significantly correspond with the degree of satisfactions that the respondents derived from the educational instructional video contents as both are valuable at favourable mean values

Q2: **How does NOUN consider making her educational instruction video open access on social media?**

Director of Learning Content Management of NOUN in an interview confirmed the invaluable influence of the NOUN open courseware on both the ODL instructors, ODL students, and non ODL users within and outside Nigeria. While reinforcing the reason why the NOUN

instructional video contents are yet to be in public domain unlike the university course materials, he affirmed that the openness of instructional video contents to public domain is still under consideration as the necessary steps to ensure the sanctity of the contents must first be ensured before fulfilling such demand. He emphasised the need to protect the copyright of the videos and the need to be assured that the videos are used for the purpose they were designed for.

## Conclusion

The submission of Adelakun et al. (2020) on the online exuberance and the fundamental human right to freedom of information that has lubricated access to information through social media has been extended to education needs. The interest and usage of instructional video on social media for educational needs stems out of the convenience, interactivity and the interest in lifelong learning that devoid of age barrier. The essence of this work therefore confirmed the pressing needs of NOUN educational instructional video contents in the public domain to consolidate the university open courseware, which has become a major reading education resource within and outside the fold of ODL system. NOUN perspective to ensure the sanctity of the university instructional video contents was considered a principal actor in maintaining the trust in the adoption and application of the video contents to knowledge.

Considering the two perspective of needs and the gratification of needs for educational instructional video contents of reputable source, this work thereby concluded that certain level of moderation be applied while the NOUN instructional video contents are made open access through social media to distinguish such from the unbranded contents.

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# Students' Perception of Online Mode of Facilitation at the Apapa Centre of the National Open University of Nigeria

# La Perception des Etudiants du Mode de Facilitation en Ligne au Centre d'Apapa de la National Open University of Nigeria

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## Abstract

*The National Open University of Nigeria (NOUN) adopted the online mode of facilitation among other resources to educate its over 100, 000 students. Students' perceptions of the effectiveness of the online mode of facilitation at the NOUN could be multifaceted. This study employed a quantitative technique to examine the NOUN students' perceptions of the efficiency of the institution's online facilitation in meeting their educational expectations and to identify concerns that can have implications for appropriate intervention by the NOUN's support system. Data were obtained from 80 students at the Apapa Study Centre of NOUN using questionnaire instruments. The questionnaires were administered through systematic random sampling techniques to some selected categories of students across the 72 programs of the 8 faculties of the University. Statistical tools (frequencies and percentages) were used to analyse and determine the students' levels of awareness and effectiveness of the NOUN's mode of online facilitation in enhancing their overall educational pursuits and online learning experiences. The study findings revealed that students' experiences of the*

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*NOUN mode of online facilitation have enhanced their learning efficiency, which enables them to engage in their studies/research at their convenience time, study on their own, and enhance their proficiency in the use of computers and online learning experiences. Nonetheless, there is a need for the NOUN's authorities to continually improve their support systems to enhance the opinions of a few students whose perceptions were relatively negative about the institution's mode of online facilitation.*

***Keywords*:** Online facilitation, students' perception, online learning, students' support systems.

**Résumé**

*L'Université nationale ouverte du Nigeria (NOUN) a adopté le mode de facilitation en ligne, entre autres ressources, pour éduquer ses plus de 100 000 étudiants. Les perceptions des étudiants sur l'efficacité de ce mode de facilitation pourraient être diverses. Cette étude a utilisé une approche quantitative pour examiner les perceptions des étudiants de la NOUN quant à l'efficacité de la facilitation en ligne de l'institution pour répondre à leurs attentes éducatives et pour identifier les préoccupations ayant des implications pour une intervention appropriée du système de soutien de la NOUN. Les données ont été obtenues auprès de 80 étudiants du centre d'études d'Apapa de la NOUN à l'aide d'instruments de questionnaire. Les questionnaires ont été administrés par des techniques d'échantillonnage systématique aléatoire à certaines catégories sélectionnées d'étudiants dans les 72 programmes des 8 facultés de l'Université. Des outils statistiques (fréquences et pourcentages) ont été utilisés pour analyser et déterminer le niveau de conscience des étudiants et l'efficacité du mode de facilitation en ligne de la NOUN dans l'amélioration de leurs poursuites éducatives globales et de leurs expériences d'apprentissage en ligne. Les résultats de l'étude ont révélé que les expériences des étudiants avec le mode de facilitation en ligne de la NOUN ont amélioré leur efficacité d'apprentissage, leur permettant de s'engager dans leurs études/recherches à leur convenance, d'étudier de manière autonome et d'améliorer leur maîtrise de l'informatique et de l'apprentissage en ligne. Cependant, il est nécessaire que les autorités de la NOUN améliorent continuellement leurs systèmes de soutien pour renforcer les opinions de quelques étudiants dont les perceptions étaient relativement négatives à l'égard du mode de facilitation en ligne de l'institution.*

***Mots-clés* :** Facilitation en ligne, perception des étudiants, apprentissage en ligne, systèmes de soutien aux étudiants.

## Introduction

The National Open University of Nigeria (NOUN) was first established in 2002 but started full operations in 2003. It offers an Open and Distance Learning (ODL) mode of online facilitation. The NOUN is unique as it is the only single mode of ODL federal institution in Nigeria. The online facilitation mode of learning is practicable in the multi-campus system, otherwise known as study Centres (Okopi, 2010; NOUN-DMIS, 2020). The ODL and NOUN mode of operations is flexible and allows students to study at their convenience such as when, where, how, and duration they choose to study. The flexibility of the NOUN programs allows students to study more easily while fulfilling commitments to work and studying as well as attending to routine family or societal demands (Ipaye, 2010; NOUN, 2018). Thus, those living in remote areas, distant places, bad topography, limited transport systems access, and prison/refugee camps can study at their pace and convenience and undertake courses that would otherwise be inaccessible to them when compared to the circular system of education (Okopi, 2010; Agbebaku and Majebi, 2020; Mather and Sarkans, 2018, NOUN-DMIS, 2021).

Furthermore, the NOUN online mode of facilitation provides a variety of study opportunities for programs such as academic pursuit, technical/vocational, personal, and professional development, and basic education to other categories of students such as young adults, adults returning to learning, those preparing to enter trades and other professions, but are interested in acquiring new work-related skills (Ipaye, 2007; NOUN-DMIS, 2021). The NOUN mode of study and facilitation involves a rather low degree of physical interactivity between teachers/tutors and learners/students. Thus, this is part of the features of the ODL services in the separation of learners and teachers in time, space, and place (COL, 2002; NOUN-DMIS, 2021). Some minimal levels of interaction are still considered vital in the ODL single-mode institutions like that of NOUN. These levels of contact are in the areas of screening for entry certificates, examination, clearance, and graduation (Ipaye, 2007; 2010; Okopi, 2010; Agbebaku, 2018).

However, the commencement of the online system of facilitation perhaps because of the COVID-19 pandemic that necessitated social restrictions of persons has further generated diverse perceptions, and inquiries among students at the over 100 Centres offering various programs at different levels (certificates, diplomas, undergraduates, and postgraduate) at the NOUN study Centres (NOUN-DMIS, 2021). It is important to ascertain the extent to which the NOUN's support systems have aided the effective delivery of its ODL and the mode of facilitation from the perspectives of students who benefit from its services. This is necessary, as no previous study has been conducted in this regard, especially in the context of a major study Centre (the Apapa Centre, Lagos State, Nigeria) which is one of the Centres with the largest population of students in the institution. These can help to unravel where there are needs for improvements that can further enhance service delivery to students and provide answers to their questions. Therefore, the objective of this study is achieved by asking and analysing the following questions from the students' perspectives: (a) what are the students' levels of awareness of the mode of online facilitation at the NOUN? (b) what are the students' levels of perceptions of how the NOUN mode of online facilitation enhances their studies/research?; (c) what are the students' levels of perception on how the NOUN mode of online facilitation assists them to study on their own?; (d) what are the students' levels of perception on how the availability of the NOUN mode of online facilitation allows them to continue their education?; (e) What are the students' levels of perception on how the usage of computer and internet facilities have helped them to improve their learning in the NOUN mode of online facilitation?, and (f) what are the students' levels of perception on how the NOUN mode of online facilitation encourages them to study at their convenient time?

## Conceptual Analyses

### Perception of Students about Open and Distance Learning

The term perception in this study connotes awareness about a program to be accomplished such as the mode of online facilitation of the NOUN. Prospective students have diverse thoughts about the

operations of the ODL system. They are obliged to know about the processes and mode of operations of the NOUN programs and why NOUN programs differ from the circular or conventional education system before embarking on the programs. Before inquiries about NOUN programs, a few of the prospective students believed that there are limited differences between the ODL-NOUN mode of study and the conventional education system. Thus, the difference between the NOUN's mode of study via online facilitation and the conventional methods is in the mode of service delivery of non-face-to-face with students. Inquiries about the ODL and NOUN operations and mode of study can be made easier with the aid of e-facilitation (Okopi, 2010; Agbebaku and Majebi, 2020; NOUN-DMIS, 2021).

## E-Facilitation

E-facilitation refers to the different types of online dialogue that are facilitated and managed. The e-mail-based interaction is one of the most frequently used types of online dialogue that enhances the ODL and NOUN mode of online facilitation. E-mail services are a direct form of communicating with students since messages go straight to the inbox of the participating students. Thus, the services of e-facilitation have tremendously helped students in their quest for knowledge about the NOUN programs. In addition, messages about the mode of online facilitation are sent to prospective and continuing learners through the Visitor's Information Call Centre (VICC) and the LSS system of the NOUN (NOUN, 2014; Agbebaku, 2018; NOUN-DMIS, 2021).

## Online Mode and Non-Face-to-Face-Facilitation

The online mode of studying and the non-face-to-face facilitation are similar, and these two concepts can be used interchangeably. This dual mode of studying is what is operational in the ODL and NOUN modes of study. The online medium and e-facilitation accommodate all categories of students, without limit to the number of requests by students' time and distance (NOUN, 2014). With the aid of internet-enabled devices including laptops, desktops, mobile phones, and other devices, students can access information, present research findings, study with ease, at their convenience, and participate in examinations

from anywhere (Agbebaku, 2018; LSS, 2021; NOUN-DMIS, 2021). These modes of online facilitation tend to enhance virtual learning interactions between students and facilitators through various internet-enabled platforms (NOUN, 2014; Agbebaku, 2018; NOUN-DMIS, 2021).

## Learner Support System and Learners Content Management System

The services of the directorates of Learner Support System (LSS) and Learner Content Management System (LCMS) play an integral part in the ODL and NOUN process. They provide technical, administrative, and counseling support for facilitators and students to enhance the online mode of facilitation of the NOUN. The LSS provides the students with the necessary learning support services that enhance the aims and objectives of the operations of the NOUN-ODL mode of service delivery. These include attending to pre-admission inquiries, orientation, registration, counseling awareness, accessibility of course materials, e-library, e-laboratory e-seminars/research proposal, and project defense presentation (NOUN, 2013; Agbebaku, 2018; Agbebaku and Majebi, 2020; NOUN-DMIS, 2021). On the other hand, the LCMS provides technical support services that enhance the NOUN online mode of facilitation to students. These technical supports are usually through the medium of the instructional delivery components (see plate 1) in the areas of support to facilitators (internal and external) and students. The LCMS also provides platforms for recording live sessions (instructional videos, online facilitation classes, and interactive sessions) and resolving technical challenges (LCMS, 2021). Plate 1 shows the instructional delivery component of the LCMS (NOUN, 2013; Agbebaku and Majebi, 2020; NOUN-DMIS, 2021; LCMS, 2021).


**Plate 1:** Instructional Delivery Component
**Source:** LCMS, 2021.

## Research Methods

The area of study is the NOUN's Apapa Study Centre, Lagos. The study Centre serves as a replica of other NOUN study Centres across the country. The Centre is the 2nd largest after the Agidigbi (now known as the Lagos study Centre) in terms of student population and level of security measures among the other 7 study Centres in Lagos state. This is because the Centre is situated within one of the training schools of the Nigerian Navy Service (NNS), Quorra of the Naval Western Command, located along Dockyard Road Apapa, Lagos State. The study Centre's student population was 2,477 (NOUN-DMIS, 2021. The major role of study Centres is to facilitate interaction between students and the operations of the NOUN (Agbebaku and Majebi, 2020; NOUN-DMIS, 2021). The population size (2,477) comprises the study student population across the 8 Faculties and Departments of the different disciplines and programs of studies of NOUN at the time of the survey (2020).

The study sample comprised 80 students from the Apapa study Centre who were randomly selected. The Apapa study Centre was chosen for the study because it is one of the largest hubs of study for civilians and military personnel, a conducive learning environment, and a highly secure environment for learning. The research design adopted for the study was a survey approach involving the use of questionnaire administration. A total of 72 programs are offered in the 8 Faculties and Departments of NOUN. These programs of certification comprise

certificates, diplomas, first degrees, postgraduate diplomas, and postgraduate courses/programs. A total of Eighty (80) copies of questionnaires were designed and administered to students across the 8 Faculties and Departments. The essence of the spread of questionnaire administration across these programs is to validate the objective of the research on the assessment of the levels of student's perceptions of the mode of facilitation of NOUN programs with emphases on the mode of learning and facilitation. The questionnaire was structured in line with the objective of the study to solicit information on students' perception of the mode of facilitation of NOUN. The questionnaire was divided into 2 sections (i.e., A and B). Section A solicits the demographic details of the respondents, including sex, age, marital status, educational qualifications, rank/position, and working experience. Section B of the questionnaire was structured into 11 questions to examine students' levels of agreement with the mode of facilitation in the NOUN using the Likert-5-Point scale: Strongly Agreed (SA), Agreed (A) Disagreed (D) Strongly Disagreed (SD), and Undecided (U). Eighty copies of the questionnaires were administered for one week toward the commencement of the NOUN 2020_2 Semester Examination. On each day of questionnaire administration, a default number of 2 copies were administered per day across each of the 8 Faculty for 5 days, based on the number of students on the ground.

This results in a sub-total of 16 copies per the 8 faculties and 10 copies of the questionnaires were administered in the one-week duration for the questionnaire administration exercise at the study Centre. The essence of the equitable distribution of questionnaires is to have a holistic view of the student's perception of the ODL and NOUN mode of facilitation across the study Centre in Nigeria. The period of questionnaire administration was timely and was carried out immediately after the outbreak of the global COVID-19 Pandemic in February 2021. This timing was ideal because students would have gotten a feel of the global lockdown from the COVID-19 Pandemic and resumed studying and preparing for the semester examination. Data from various sources were analysed with the use of descriptive statistical techniques of mean frequency and percentage. Thus, the distribution and administration of questionnaires across the eight (8)

faculties and thirty (30) departments was presented in Table 1 and Table 2. Table 1 shows details of the number of students per faculty, the total number of programs offered for certification, and questionnaire administration per day at the study Centre. Table 2 shows the number of departments under each faculty at the NOUN.

**Table 1: Questionnaires Administration across the 8 Faculties of NOUN.**

| S/N | Faculty | No. of Student Per Faculty | Total Number of Programs Offered per Faculty | Number of Questionnaire Administration | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Mon Day 1 | Tues Day 2 | Wed Day 3 | Thurs Day 4 | Fri Day 5 | |
| 1 | Sciences | 555 | 12 | 2 | 2 | 2 | 2 | 2 | 10 |
| 2 | Social Science | 754 | 12 | 2 | 2 | 2 | 2 | 2 | 10 |
| 3 | Agric. Science | 08 | 03 | 2 | 2 | 2 | 2 | 2 | 10 |
| 4 | Education | 197 | 15 | 2 | 2 | 2 | 2 | 2 | 10 |
| 5 | Arts | 38 | 09 | 2 | 2 | 2 | 2 | 2 | 10 |
| 6 | Management Sciences | 773 | 17 | 2 | 2 | 2 | 2 | 2 | 10 |
| 7 | Health Sciences | 83 | 03 | 2 | 2 | 2 | 2 | 2 | 10 |
| 8 | Law | 69 | 01 | 2 | 2 | 2 | 2 | 2 | 10 |
| **S-Total** | **8** | **2,477** | **72** | **16** | **16** | **16** | **16** | **16** | **80** |
| **Total** | | | | | | **80** | | | |

**Source:** NOUN DMIS, (2021).

**Table 2:** Faculty and Department of NOUN

| S/N | Faculty | Department |
|---|---|---|
| 1 | Agricultural Science | (a)Crop and Soil Science, (b)Agricultural Extension and Economics, and (c)Animal Science and Fisheries |
| 2 | Arts | (a)English, Linguistic, (b)Foreign and Nigerian Languages, and (c)Religious Studies |
| 3 | Education | (a)Arts and Social Science Education, (b)Education Foundation, and (c)Science Education |
| 4 | Health Science | (a)Public Health Science, (b)Environmental Health, and (c)Nursing |
| 5 | Law | (a)Law |
| 6 | Management Sciences | (a)Financial Studies, (b)Business Administration, (c)Entrepreneurial Studies, and (d)Public Administration |
| 7 | Sciences | (a)Biological Science, (b)Chemistry, (c)Computer Science, (d)Environmental Science, (e)Mathematics, and (f)Physics |
| 8 | Social Science | (a)Tourism Studies, (b)Peace and Conflict Resolution, (c)Criminology and Security Studies, (d)Economics, (e)Political Science, (f)Development Studies, and (g)Mass Communication and Journalism. |

**Source:** NOUN DMIS, (2021).

## Results

The results and discussion on the student levels of perceptions of the NOUN mode of online facilitation at the NOUN's ASC, Lagos are presented in Table 3 based on the 11 items used for the survey.

## Results Presentation

**Table 3:** Breakdown Analysis of the Students' Perception of the Mode of Facilitation of NOUN.

| S/N | Items | SA | A | D | SD | U |
|---|---|---|---|---|---|---|
| 1 | Students' levels of awareness about online facilitation mode of learning | 47(58.75) | 13(16.25) | 5(6.25) | 10(12.50) | 5(6.25) |
| 2 | Students' levels of agreement on whether the NOUN mode of online facilitation enhances their learning efficiency. | 45(56.00) | 10(12.50) | 15(18.75) | - | 10(12.50) |
| 3 | Students' levels of agreement on whether their experience of the NOUN mode of online facilitation enhances their studies/research. | 40(50.0) | 20(25.0) | 5(6.25) | 10(12.5) | 5(6.25) |
| 4 | Students' levels of agreement on whether their experience of the NOUN mode of online facilitation would enable them to recommend NOUN program(s) to others. | 43(53.75) | 22(27.5) | 5(6.25) | 10(12.5) | - |
| 5 | Students' levels of agreement on how the NOUN mode of online facilitation assists them to study on their own. | 49(61.25) | 16(20.00) | 5(6.25) | 10(12.50) | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | Students' levels of agreement on how the availability of the NOUN mode of online learning allows them to continue their education. | 41(51.25) | 24(30.00) | 10(12.25) | 5(6.25) | |
| 7 | Students' levels of agreement on whether the NOUN mode of online facilitation allows them to work and study. | 46(57.50) | 14(17.50) | 5(6.25) | 10(12.5) | 5(6.25) |
| 8 | Students' levels of agreement on how their experience of the NOUN mode of online facilitation has improved their proficiency in computer usage. | 39(48.75) | 21(26.25) | 10(12.50) | 10(12.50) | - |
| 9 | Students' levels of agreement on how the NOUN mode of online facilitation has helped in boosting their academic performance. | 45(56.25) | 15(18.75) | 10(12.5) | - | 10(12.5) |
| 10 | Students' levels of agreement on how the NOUN mode of online facilitation encourages them to study at their convenience time. | 30(37.5) | 25(31.25) | 5(6.25) | 20(25.0) | - |
| 11 | Students' levels of agreement on how the NOUN mode of online facilitation enables them to get used to the online mode of learning. | 35(43.75) | 15(18.75) | 10(12.5) | 10(12.5) | 10(12.5) |

**Key:** Strongly Agreed (SA), Agreed (A), Disagreed (D), Strongly Disagreed (SD), and Undecided (U).
**Source**: Authors' Field Survey (2021).

The presentation of the results from Table 3 shows the analyses of students' perceptions regarding the NOUN mode of online facilitation. The results from Item 1 on students' levels of awareness about the online facilitation mode of learning show that many (75%) of the respondents agreed with this statement, while about 19% of the respondents disagreed. Despite these positive responses, this finding suggests that there is a need for the NOUN's support systems to create more awareness about its online mode of facilitation to reach the few students who are unaware of it, for the enhancement of their learning. The results from Item 2 on the students' levels of agreement on whether the NOUN mode of online facilitation enhances their learning efficiency revealed that many (about 69%) of respondents agreed with this statement. However, only about 19% of the respondents disagreed. This result suggests that there is a need for the University to unravel and address the concerns of a few students who require improvement in online facilitation.

The results from Item 3 on students' levels of agreement on whether their experience of the NOUN mode of online facilitation enhances their studies/research revealed that many (75%) of the respondents agreed with this statement. However, about 19% of the respondents do not agree with the statement. This result also suggests the need for the NOUN's authority to unravel and address the concerns of a few students who seek an improved experience in its online mode of facilitation to enhance their studies.

The results from Item 4 on students' levels of agreement on whether their experience of the NOUN mode of online facilitation would enable them to recommend NOUN program(s) to others revealed that many (over 81%) agreed with the statement. However, about 19% of the respondents disagreed with the statement. This suggests that there is still a need for the NOUN's authority to identify and address the concerns of a few students who would not recommend the University to others, even though there are many others who would, based on their experiences of its mode of online facilitation.

The results from Item 5 on Students' levels of agreement on how the NOUN mode of online facilitation assists them in studying on their

own revealed that many (over 81%) of the respondents agreed with this statement. However, about 19% of the respondents disagreed with the statement. This also suggests the need for the NOUN's authorities to identify the concerns of the few students who do not agree with the statement with a view to addressing their concerns.

The results from Item 6 on students' levels of agreement on how the availability of the NOUN mode of online learning allows them to continue their education revealed that many (over 81%) of the respondents agreed with the statement. However, about 19% of the respondents disagreed with the statement. This result suggests the need for the NOUN's authority to unravel why some students do not think its mode of online facilitation allows them to continue with their education, even though they are enrolled in NOUN's programs.

The results from Item 7 on Students' levels of agreement on whether the NOUN mode of online facilitation allows them to work and study revealed that many (75%) of the respondents agreed with this statement. However, about 19% of the respondents disagreed with the statement. This result suggests the need for the NOUN's authorities to identify why a few students are unable to work and study even though the NOUN's system of online facilitation enables them to do so.

The results from Item 8 on Students' levels of agreement on how their experience of the NOUN mode of online facilitation has improved their proficiency in computer usage revealed that many (75%) of the respondents agreed with is statement. However, 25% of the respondents disagreed with the statement. This result suggests the need for the NOUN authorities to consider organising practical computer training sessions for students who need to improve/develop their computer skills to enhance their online facilitation experiences.
The results from Item 9 on Students' levels of agreement on how the NOUN mode of online facilitation has helped boost their academic performance revealed that many (75%) of the respondents agreed with this statement, while about 13% of them disagreed. Still, this result suggests the need for the NOUN's authorities to further enhance the academic performance of its students by improving its online mode of facilitation.

The results from Item 10 on students' levels of agreement on how the NOUN mode of online facilitation encourages them to study at their convenience time show that many (about 69%) of the respondents agreed with this statement, while over 31% of them disagreed. This result suggests the need for the NOUN's authorities to develop training sessions on time management for students and remind them to access recorded online facilitation sessions when they are unable to attend scheduled lessons.

The results from Item 11 on Students' levels of agreement on how the NOUN mode of online facilitation enables them to get used to the online mode of learning revealed that many (about 63%) of the respondents agreed with this statement, while 25% of them disagreed. This result suggests the need for the NOUN's authorities to introduce training sessions to help some students have improved experiences of online modes of facilitation to enhance their interests in online learning.

**Discussion**

Research Question 1: a) what are the students' levels of awareness of the mode of online facilitation at the NOUN?

The study revealed that a significant number of the students are aware of the mode of online facilitation at the NOUN and that it enhances their learning efficiency. However, a few students disagreed. These findings are consistent with the study of Mather and Sarkans (2018) which suggests that students are familiar with online facilitation attested to improvement in their learning. Nonetheless, there is a need for the NOUN's authority to improve its awareness of its online mode of facilitation, including organising programmes to educate/reach students who may not be aware of it, for the enhancement of their learning.

Research Question 2: b) what are the students' levels of perceptions of how the NOUN mode of online facilitation enhances their studies/research?

The study revealed that most of the students perceive the NOUN's mode of online facilitation as helpful toward their studies/research. Consequently, the study further revealed that most of the students would recommend NOUN's programmes to prospective students. This shows that NOUN's online facilitation is beneficial to many students for them to be willing to recommend University's programmes to prospective students. To consolidate these positive students' perceptions, the study suggests the need for the NOUN's authority to develop measures that can help to regularly evaluate the perceptions of students to identify concerns that may require appropriate measures to improve their studies via their online facilitation experiences.

Research Question 3: c) what are the students' levels of perception on how the NOUN mode of online facilitation assists them to study on their own?

The study revealed that a substantial number of the students affirmed that the NOUN's mode of online facilitation enables them to study on their own. However, the opinions of a few other students varied. These findings are consistent with the study of Agbebaku and Majebi (2020) which found that although online facilitation enables students to study on their own, they would require the regular presence of online facilitators during scheduled online sessions. This study's findings imply that the NOUN's authorities still need to ensure that facilitators attend their online sessions promptly and participate in training and retraining sessions that can help to improve more students' ability to study on their own.

Research Question 4: d) what are the students' levels of perception on how the availability of the NOUN mode of online facilitation allows them to continue their education?

The findings reveal that a significant number of students can continue their education, study, and work because of the NOUN's mode of online facilitation. Still, the study findings suggest that the NOUN's authorities need to further improve their mode of online facilitation by identifying and addressing other students' concerns to enable them to continue with their education.

Research Question 5: e) What are the students' levels of perception on how the usage of computers and access to the internet has helped them to improve their learning in the NOUN mode of online facilitation?

The study findings revealed that many of the students affirmed that their usage of computers and access to the internet has enhanced their learning and boosted their academic performance because of the NOUN's mode of online facilitation. These findings corroborate Mather and Sarkan's (2018) study which suggests improvement in students' online learning because of their use of information and communication technologies tools. The finding of this study is not surprising because Borup et al. (2019) state the positive aspects of online facilitation too, especially regarding the training of facilitators and tutors on information and communications tools to enhance the online learning experiences of students. Despite this positive result, there is a need for the NOUN's authorities to organise scheduled training sessions for students who require computer appreciation skills to enhance their learning and academic performance when participating in the institution's online mode of facilitation. This is in addition to the continuous training and retraining of facilitators and tutors to improve their capacities and students' experiences.

Research Question 6: f) what are the students' levels of perception on how the NOUN mode of online facilitation encourages them to study at their convenience time?

The study revealed that a significant number of the students indicated that the NOUN's mode of online facilitation enables them to study at their convenience time and get used to the online mode of learning. Yet, it is important that the NOUN's authorities continue to make its mode of online facilitation attractive to encourage more students to study at their convenience time and become more familiar with the online learning system of education.

## Conclusion and Recommendations

The study has established that the online facilitation at the National Open University of N has given many students invaluable benefits, even though there is room for improvement as regards online course delivery. To consolidate the positive perceptions that most students hold about the University's mode of online facilitation, and to improve the perceptions of a few students whose opinions differ, the University can introduce a pre- and post-semester-based survey to assess the expectations and experiences of students for necessary intervention. This study contributes to the existing literature on online facilitation and open and distance learning and can serve as a guide for other studies in the subject area. Nevertheless, as this study's findings are peculiar to the Apapa study Centre, the study recommends that similar studies be conducted at other key and small study Centres of the NOUN and similar institutions to compare the opinions of students, including identifying their concerns for the institutions' requisite intervention(s).

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***Commentary:***

# Reflections On Recent Developments in Inclusive Open and Distance Learning

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By its very nature, open and distance learning (ODL) ought to be inclusive, given that it is access oriented. In this short reflective piece, we mull over recent developments in the ODL terrain against the backdrop of the post-COVID-19 era and the advent of the Fourth Industrial Revolution (4IR), which is driven by artificial intelligence (AI). The outbreak of the COVID-19 pandemic forced populations worldwide to stay at home to avoid the spike in infections, which had the potential for devastating loss of human lives. In March 2020 UNESCO reported that an estimated 1.6 billion learners worldwide were negatively impacted by closures of institutions of learning due to the outbreak of the COVID-19 pandemic. The pandemic caused global disruptions on an unprecedented scale and forced work, teaching, learning, research, and daily communication to be undertaken online.

ODL can be described as an organised educational activity in which the constraints on study are minimised in terms of access, entry, or time and place, pace, method of study, or any combination of these. It is an educational design intended to reach learners in their homes, offices, shops, or anywhere, and to provide learning opportunities for them to obtain higher education qualifications without attending formal classes in person. ODL therefore creates opportunities for lifelong learning, no matter where or when the students want to study (Letseka & Pitsoe, 2014). It is mediated through the uses of information and communication technologies (ICTs). These technologies include access to the internet, learning management systems (LMS), video conferencing platforms such as Zoom, Microsoft Teams, or Google Meet, as well as gadgets such as laptops, Tablets, and smart phones.

The notion of openness is multifaceted and highly contested. Gourley & Lane (2009) conceive of openness in distance learning as a system of higher education offerings where there are no barriers to entry, no entry requirements – only exit standards. Where a person's background and previous advantage or disadvantage are entirely irrelevant. They argue that "open education potentially opens not only who produces the 'content' and the 'context' in which the 'content' is learned, but also who validates that learning so that it has the currency in the labour and/or interest markets". For Letseka (2021:134), openness denotes "removing barriers to access learning, flexibility of learning provision,

student-centredness, supporting students and constructing learning programmes with the expectation that students can succeed". In this regard, "ODL is accessible in terms of time, pace, space and people, without barriers".

The concept of inclusion is another area of contestation. When inclusion is superficially practised, it concomitantly results in exclusion. Mutanga (2015) argues that the main conceptual weakness of current understanding around inclusion and exclusion is a failure to engage with social justice concerns. It is difficult to agree on what educational exclusion means. Moreover, the language of exclusion is so versatile and adaptable that there may be a temptation to dress up every deprivation as a case of social exclusion. Ainscow (2005) highlights the following key elements for inclusion in education. First, inclusion is a never-ending process of finding better ways to respond to diversity. Second, it aims at identifying and removing barriers. Third, it is concerned about teaching presence, participation, and achievement of learning objectives for all students. Finally, it is about ways in which groups of learners who may be at risk of marginalisation, exclusion or underachievement might be supported to succeed. Thus, inclusion requires a deeper conception of access, one that incorporates the full range of resources which inform required understanding of access and value in learning (Czerniewicz & Brown, 2009). Maile (2016) argues that for those who could not get the right skills in the first chances, ODL provides opportunities that can be regarded as second chances.

During COVID-19 the requirement for work, teaching, learning, research, and all forms of communication to be undertaken online was premised on the perceived ubiquity of the offerings of the 4IR. When learners and students were forced to stay at home it was generally assumed that they will be in family households that have access to electricity and reliable internet connectivity, and that they will have the basic tools of the trade such as laptops, Tablets, and/or smart phones. However, this assumption was flawed in that it glossed over critical fault lines of global socio-economic inequalities. Chancel, Piketty, Saez & Zucman (2022) write that global wealth inequalities are more pronounced than income inequalities. The richest 10% of the global

population currently takes 52% of global income, whereas the poorest half of the population earns only 8.5%. On average, an individual from the top 10% of the global income distribution earns $122,100 per year, whereas an individual from the poorest half of the global income distribution only makes $3,920 per year. Chancel et al (2022) argue that the poorest half of global population barely owns any wealth at all, possessing just 2% of that total. In contrast, the richest 10% of the global population own 76% of all wealth. On average, the poorest half of the population owns 'Purchasing Power Parity' (PPP) of $4,100, while the top 10% own $771,300 on average.

What do these indicators mean for ODL? They put the 4IR and digital transformation at the centre of the way work is done. But they also highlight the potential for massive digital exclusions. Ironically, the outbreak of the COVID-19 pandemic can be said to have functioned as a catalyst for innovative ideas and the rollout of digital transformation initiatives in ODL. These ideas and initiatives marked the integration between the physical, digital, and biological spheres (Neto, Maia, Neiva, Scalia, Salgueirinho & Guerra, 2020). Machines and algorithms ushered in the era of fully autonomous robot surgeons operating in hospitals, as well as autonomous vehicle driven by AI. There has been a burgeoning of smart learning centres at universities worldwide in areas such as cyberlearning and intelligent technologies, as well as endowed Chairs in nanoscience and nanotechnology, AI in education, innovation and development, online learning, open educational resources (OERs), and open distance and e-learning. These smart learning centres and endowed Chairs are dedicated to advancing cutting edge research in AI in education in support of the attainment of sustainable development goals (SDGs); the role of big data and data analytics; open educational resources (OERs); innovation and development; online learning, and open distance and e-learning to mention a few.

In 2021 UNISA launched the Academic Development Open Virtual Hub (ADOVH), which is a fully automated self-recording studio which caters for self-recording and streaming of educational videos to UNISA's distance education students. During the UNISA International Open Distance e-Learning annual research conference in August 2023

the ADOCV celebrated the arrival of Ulwazi, the first artificial intelligence humanoid at UNISA, further cementing the university's embracing of AI in higher education.

With a student headcount of over 400 000, including international students from 130 countries worldwide, making it one of the world's *mega* universities in Africa. In 2021 UNISA readapted its comprehensive open distance eLearning (COD*e*L) strategy to enable it to administer online examinations for over 180 000 students. UNISA's COD*e*L strategy embraces digital transformation to leverage on 4IR technologies, thus allowing it to become a fit-for-purpose, future-fit and tech-fit institution. Focused and strategic use of AI within organisations with large student numbers such as UNISA assists with data manipulation and brings efficiency to mundane repetitive tasks, resulting in quick and accurate decision-making. Thus, in future, AI is going to be pivotal to the way ODL is conceived and practised.

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# Information for Authors

## Formatting Instructions

## Regular articles

All portions of the manuscript must be **double-spaced** and all pages numbered starting from the title page.

The Title should be a short phrase describing the contents of the paper. Where possible the title should not be longer than 18 words. Please do not type titles in upper case. The Title Page should include the authors' full names and affiliations, the name of the corresponding author along with phone, and e-mail information. Present addresses of authors should appear as a footnote. For joint publications, the name of the corresponding author should be indicated with an asterix to it.

The Abstract should be concise informative and completely self-explanatory. The Abstract should be between 200 and 250 words. Complete sentences, active verbs, and the third person should be used, and the abstract should be written in the past tense. Standard nomenclature should be used and abbreviations should be avoided. No literature should be cited.

Following the abstract, about 3 to 5 keywords that will provide indexing references should be provided. A list of non-standard Abbreviations should be added. In general, non-standard abbreviations should be used only when the full term is very long and used often. Each abbreviation should be spelt out and introduced in parentheses the first time it is used in the text.

The Introduction should provide a clear statement of the problem, the relevant literature on the subject, and the proposed approach or solution. It should be understandable to colleagues from a broad range of disciplines teachable and learnable by open and distance learning approach.

Materials and methods should be complete enough to allow experiments to be reproduced. However, only truly new procedures should be described in detail; previously published procedures should be cited, and important modifications of published procedures should be mentioned briefly. Subheadings should be used. Methods in general use need not be described in detail.

Results should be presented with clarity and precision. The results should be written in the past tense when describing findings in the authors' experiments. Results should

be explained, but largely without referring to the literature. Discussion, speculation and detailed interpretation of data should not be included in the Results but should be put into the Discussion section.

The Discussion should interpret the findings in view of the results obtained in this and in past studies on this topic. State the conclusions in a few sentences at the end of the paper. The Results and Discussion sections can include subheadings, and when appropriate, both sections can be combined.

Implications for ODL: Authors should point out the implications of their findings for ODL in various aspects of policy, practice, administration and other areas. Implications for ODL especially in developing nations and technology starved environments may also be mentioned.

The acknowledgments of people, grants, funds, etc. should be brief.

Tables should be kept to a minimum and be designed to be as simple as possible. Tables are to be typed double-spaced throughout, including headings and footnotes. Each table should be on a separate page, numbered consecutively in Arabic numerals and supplied with a heading and a legend. Tables should be self-explanatory without reference to the text. The details of the methods used in the experiments should preferably be described in the legend instead of in the text. The same data should not be presented in both table and graph form or repeated in the text.

Figure legends should be typed in numerical order on a separate sheet. Graphics should be prepared using applications capable of generating high resolution GIF, TIFF, JPEG pasting in the Microsoft Word manuscript file. Tables should be prepared in Microsoft Word. Use Arabic numerals to designate figures and upper case letters for their parts (Figure 1). Begin each legend with a title and include sufficient description so that the figure is understandable without reading the text of the manuscript. Information given in legends should not be repeated in the text.

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*Examples of in-text references*: Abdallah (2000), Agbu et al. (2016), (Ofulue, 2011), (Agbebaku and Majebi, 2020), (Ogidan, 2012; Jegede, 2005 a, b;) Ofoha, 2010, 2013), (Peters et al. 1999)

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Marshall, J. (2016) Online Course Selection: using course dashboards to inform student enrollment decisions. Open Learning: The Journal of Open, Distance and elearning, 31(3), 245-259.

Ojo, O., Olakulehin, F., Olowola, R., Adeoye, F. & Salawu, I (2007) Evaluation of assessment methods as correlates of quality assurance and certification standards in ODL Institutions. Indian Journal of Open Learning, 16(3), 245-253

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Maudlin, M.P. and K.L. Gustafson. (1997) Is Instructional Design a paradigm for Public Education. In CLR. Dills & A.J. Romiszowski (Eds.) Instructional Development Paradigms. Edu

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Short Communications are limited to a maximum of two figures and one table. They should present a complete study that is more limited in scope than is found in full-length papers. The items of manuscript preparation listed above apply to Short Communications with the following differences:

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- Abstracts should be between 200 and 250 words, with three (3) to five(5) keywords below.
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- References should follow the American Psychological Association (APA) style, 7th edition.
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***Abridged Version***

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