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Exploring the Potentials of YouTube Video-Resources in Enhancing Students Learning Outcome in Environmental Education

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Abstract: Environmental Education (EE) is imperative for advocating sustainable environmental practices and awareness. This work probed the potential of YouTube video-resources in boosting tutees learning outcomes in EE, and employed pre-test/post-test control group quasi-experimental research design. Subjects include all year two tutees from the Department of Science Education, South-East Federal Universities, while 166 of them were sampled purposively from two intact classes. Two instruments; Environmental Education Achievement Test (EEAT) and Environmental Education Interest Inventory (EEII) was used. Experts thoroughly validated them and was tested for reliability using KR-20 formula, and tau-equivalent reliability with 0.85 and 0.88 index value each. The experimental group received instruction with blended YouTube-video resources, while the comparison group received theirs utilizing conventional approach, for the four-weeks period. In analysing data, Analysis of Covariance, mean, and standard deviation were utilized. Findings suggest a statistically significant improvement in the academic achievement and interest among undergraduates exposed to blended YouTube video-resources compared to those taught conventionally. It was concluded that blended YouTube videos instruction significantly enhances students learning outcome in EE. Integration of educational video content into classroom instruction cum teacher training programs to promote digital literacy was recommended.

Keywords: YouTube Video-Resources, Environmental Education, Learning Outcomes and Digital Instruction

1. Introduction

Environmental Education (EE) in Nigeria, involves a structured learning process in which students acquire knowledge, develop skills, and cultivate interest in environmental sustainability through instructional resources. The teaching of EE is essential to instil in learners the right skills, attitude, perspectives and knowledge required to tackle pressing universal environmental issues like climate change, rapid extinction in biodiversity, and pollution. Environmental education (EE) is an interdisciplinary field of study that seeks to increase students' awareness, and understanding of ecological problems while promoting attitudes and behaviours that support sustainable development. Implying that EE integrates both scientific, social, and policy driven approach to equip learners with the required skills for responsible decision-making regarding environmental challenges.

In addition, EE boost public grasp of environmental issues and their impact on human well-being and the planet (Zhao, Liu & Han, 2024). According to World Health Organization (WHO) (2021), "United Nations Sustainable Development Goals (SDGs) (UN, 2015)", Obiagu *et al.,* (2024), EE nurture pro-environmental behaviours, (managing waste, conserving energy, supporting eco-friendly agricultural practices and improving air and water quality) leading to a cleaner and healthier environment. Scholars like Leiserowitz *et al.,* (2020) argued that EE arm tutees to understand climate science, assess risks, and implementation of mitigation and adaptation strategies.

Similarly, Zeng, Zhong, and Naz (2023) opined that EE prepares students for careers in environmental sustainability, conservation, and climate resilience and encourages individuals to analyze complex environmental problems through critical thinking. Furthermore, UNESCO (2021) noted that EE ensures that people understand environmental laws, support sustainable policies, and hold governments accountable for environmental protection efforts. Despite these benefits, undergraduate students often struggle with the course due to its complex, abstract, and interdisciplinary nature, leading to low academic achievement and diminished interest. This low achievement has been attributed to the traditional lecture-based teaching methods usually used by most lecturers, which rely heavily on textbooks and theoretical explanations.

Lecture-based teaching methods has been criticized for being ineffective in fully engaging students or fostering deep conceptual understanding (Mohammed & Ogar, 2023). Addressing these challenges, requires the exploration of alternative instructional strategies that can enhance student engagement, improve comprehension, and stimulate interest. Brame (2016), Mayer (2017), Mayer, Fiorella, and Stull (2020), suggested that digital tools, like multimedia resources makes learning more interactive and effective. Similarly, Mohammed and Ogar (2023) advocate for technology integration in the teaching of environmental education, emphasizing that conventional methods mostly used by lecturers has failed to yield the required learning outcome. Hence, YouTube video-resources is one of those multimedia resources.

YouTube videos (UTV) are pedagogical tool that accommodate divers learning styles, permitting tutees to visualize and interact with educational contents beyond traditional textbook-based instruction. Abu-Taieh *et al*., (2022) theorized that YouTube is a platform that is available to everyone who wish to seek Knowledge and could also serve as a substitute to physical classroom because it is user-friendly and readily available. Roy (2023) added that YTV gives learners quick access to knowledge, information storing and sharing, and serve as a good substitute for instruction delivery. Videos could be in form of recorded lectures, animated explanations, tutorials, experiments, documentaries, and interactive lessons covering various subjects and disciplines. Mayer, (2017) viewed YouTube video-resources for teaching as a digital educational content that integrates audio-visual elements to enhance students' comprehension and engagement in learning processes. While Hrastinski (2019) explained that as part of a virtual learning ecosystem, YouTube video-resources provide an asynchronous mode of instruction that enable students to explore and revisit educational didactic materials at any time convenience.

According to Brame (2016), Boateng *et al.,* (2016) video instructions has become an important part of higher education, functioning as a bedrock of blended learning, and a major instruction mode in online courses. YouTube video fosters self-directed learning, enabling students to explore environmental topics at their own pace, and increase motivation and interest in sustainability-related subjects.

Studies shows that YouTube video-resources enhances students' academic achievement by reinforcing theoretical knowledge with engaging audiovisual content (Mayer *et al.,* 2020), makes abstract concepts more tangible through visual and auditory stimuli (Mayer, 2017), and enhance student engagement, provide multimodal learning opportunities, and cater to different learning preferences (Zhao *et al.,* 2024). Similarly, Mohammed, and Ogar (2023), Beji and Saidu (2021) argued that visual demonstrations of environmental processes improve comprehension and retention of knowledge among students and foster more interactive and engaging learning environments.

Video-based learning, particularly through online platforms like YouTube, has emerged as a significant tool in higher education, offering vast educational resources to supplement face-to-face classroom mode of instruction. Despite the increasing evidence supporting the effectiveness of video-based learning, there remains questions unanswered in literature particularly on investigating the impact of YouTube video-resources in EE at undergraduate level. While some studies examined the general impact of multimedia learning in science education post covid-19

era (Brame, 2016; Beji & Saidu, 2021; Breslyn & Green, 2022), a few or none to the researcher's knowledge have explored its specific application to EE with reference to student interest and achievement.

Achievement means the level of students' attainment of educational objectives, as significantly influenced by their self-management abilities and perceived self-efficacy. Tsaousis and Alghamdi (2022) adduced that students with strong self-management skills and strong self-efficacy are more likely to achieve superior results. In this study, academic achievement cut across various dimensions of student performance, including cognitive abilities, personality traits, and motivation, reflecting in the overall student's success in educational settings. Achieving academic success is usually good but, in most cases, very difficult. It requires consistent sacrifices (personal effort and deprivations) and commitment towards succeeding. Catalogue of studies examined factors influencing achievement and how it is measured.

Example, "Tsaousis and Alghamdi (2022) identified some personal factors such as gender, personality traits, cognitive abilities, academic background, motivation, and self-constructs as significant determinants of academic achievement". Okoro et al. (2023) found motivation and interest as the major determinants of students' achievement. In addition to academic achievement, this study sought to find out how students' interest can be enhanced or improved in EE.

Interest is the expression of enthusiasm and engagement in a particular subject, which outrightly predict one's performance in a given subject. Academic interest connotes student's intrinsic motivation and engagement with academic contents, which significantly influences their academic performance and learning outcomes (Alhadabi & Karpinski, 2020). This implies that academic interest plays a crucial role in determining students' academic outcome. In agreement, Edache-Abah, and Dike (2019) argued that interest significantly predicts students' academic success in any subject. In a similar study, engagement and motivation positively predict interest Azor *et al.*, (2020). Okoli and Ukala (2025) described interest as a psychological force that propels individuals or students' into executing an action.

There exist enough evidences in literature on the pedagogical value of digital tools such as YouTube, WhatsApp, and Google Classroom among many others in promoting learners' engagement, motivation, academic achievement and interest. However, a good number of these works were carried out in western world where infrastructure that support the utilization of these resources abound. This study tends to bridge this gap by exploring the potential multimedia learning such as YouTube video resource in improving learning outcome in higher education, particularly in resource-constrained environment like southeast Nigeria where infrastructural barriers, digital literacy disparities, and sociocultural dynamics shape how students engage with these tools. Highlighting this distinctive perspective is a proof that this work is not just a confirmatory work but an addition to the already existing scholarly value in the global database.

Regrettably, despite works that has been done by government, researchers, policy makers, individual and organizations to addressing issue, issues relating to low interest and achievement among students, little or nothing could be said to have been achieved. Suggesting that more work needs to be done. Given these gaps, probing the effectiveness of YouTube video-resources in promoting undergraduate students' learning outcome in environmental education is of particular importance in this study. By providing engaging, visually rich, and accessible content, YouTube videos can complement traditional teaching methods and improve learning outcomes. Nonetheless, acknowledging the challenges of YouTube videos in EE, such as; information credibility, risk of distraction by pop up videos, and technical and accessibility issues. Careful selection, guided usage, and pedagogically sound integration are necessary to fully leverage its potential. By addressing these bottlenecks, the work offers practical data for education stakeholders striving to optimize digital learning resources for improved academic outcomes in environmental studies.

1.1 Theoretical Framework of the Study

The study's framework was anchored on 'Cognitive Theory of Multimedia Learning (CTML)' by Richard Mayer's (2005). CTML predicate that students digest information more efficiently when instructions are delivered utilizing words and pictures. That is, by integrate both verbal and visual elements (dual coding) ensures a deeper understanding and retention among learners. This theory is in consonant with this study as YouTube videos, support

the combining of narration, text, animations, and real-life visuals, thereby reducing cognitive overload and encourage active engagement, and meaningful learning. In synergy with the forgoing, the result of this work which shows improvement in achievement and interest among learners align with the principle that a well-designed multimedia resources could stimulate multiple cognitive channels, even in a complex subjects like environmental education.

1.2 Research Questions

Using YTV and CA instructions, this study seeks to ascertain;

1. If method of instruction significantly influences average achievement rating of students in EE?
2. If method of instruction significantly influences average interest rating of students in EE?

Hypothetically, using YTV and CA instructions;

1. Students' average achievement rating in EE is not statistically significant.
2. Students' average interest rating in EE is not statistically significant.

2. Methods

A Quasi-Experimental, involving a before-and-after test design with a comparison group was deployed. This design was appropriate as it permit comparison between two or more groups while using intact classes (Creswell & Creswell, 2018).

Diagrammatic representation of the research design:

'Experimental Group A = O_1 Xa $O_{2'}$

'Experimental Group B = O_1 Xb $O_{2'}$

Where:

O_1	=	Pretest (before)
Xa	=	Treatment
Xb	=	Treatment
O_2	=	Post-test (after)
-----	=	non-randomized

Two federal universities located in the South-East were selected for the study, one as experimental while the other as control, both taught using YouTube videos and conventional approach respectively. Participants consisted of year two undergraduate from the Department of Science Education, Federal Universities in South-East offering SED 206 (Environmental Issues) during 2023/2024 academic session. Sampling purposively, two universities, with 88 and 78 (166).

Two instruments; Environmental Education Achievement-Test (EEAT) and Environmental Education Interest-Inventory (EEII). Both EEAT and EEII were developed by the researchers using SED 206 past questions, WAEC/NECO question papers, biology textbooks and reviewed literatures. To ensure that EEAT questions covered the content scope, table of specification were developed by the researchers for even generation and distribution of questions. EEAT has section A which contain participants demographic, while section B contain 15 multi-choice (A-D) questions. Each correctly answered question attracts 2 marks given a maximum of 30 score and a minimum of 0. Similarly, EEII has part A which contain participants demographic data, and part B contain 12 question items structured in 'four-point Likert scale with response options ranging from Strongly Agree (SA) to Strongly Disagree (SD), with scores of 4, 3, 2 and 1 respectively'. All responds attract mark, with maximum score being 48 and a minimum of 12.

The content scope of the study include; biodiversity and ecosystems, conservation of natural resources, climate change, environmental values, and sustainable development. The questions for EEAT and EEII were

generated within this scope. Both EEAT and EEII were thoroughly validated and piloted tested at UNIZIK using a sample of 20 year two students. EEAT yielded a reliability coefficient value of 0.85 using KR-20. Justification was because the items were scored dichotomously while EEII gave an internal consistency of 0.88 using tau-equivalent reliability. Justification was because the items were monochotomously scored.

2.1 Treatment Procedure

Prior to the experiment, the researchers first obtained authorization from both schools. Two lecturers (one from each institution) were trained (Research Assistants (RAs) for one weeks on how to teach EE concepts using YouTube video- resources and lecture method of instructions. Lesson plans for each instruction were prepared and handed to the RAs. To ensure the equivalence of the participants in terms of academic achievement and interest levels, a pre-test was conducted prior to treatment. Similarly, to ensure robust research findings, we proactively controlled for potential extraneous variables. For instance, the Hawthorne effect was mitigated by conducting instruction in students' usual lecture hall, with their regular lecturers, and according to their established timetable. To address the disparity of groups, Analysis of Covariance utilized. Furthermore, to prevent subject interactions, participants for both groups were intentionally drawn from separate schools. Treatment lasted for four weeks, and on the last day, post-test was administered using the same instruments but reshuffled after pretest. Throughout the period of the treatment, researchers kept in touch with the RAs to ensure they followed the instructions religiously.

Answering study's questions, descriptive analysis, utilizing means and standard deviations, was performed while testing the hypotheses utilized inferential analysis of Analysis of Covariance (ANCOVA), at 0.05 alpha level. Justification for ANCOVA was because the design permits the use of pre-test, which acts as covariate; as such, helped to establish the homogeneity or equivalence of the two groups before treatment.

3. Results

Question One: Do students mean achievement score in EE differ based on method of instruction?

Table 1. Descriptive Statistics for achievement Scores based on Strategies

Instructional Strategies	N	Pretest		Post-test		Mean Gain
		Mean	SD	Mean	SD	
Blended Youtube-Video	78	12.36	3.24	25.62	2.72	13.26
Conventional Method	88	11.07	4.56	21.34	2.79	10.27

Key: Mean score = Average rating, Standard deviation = SD

Result in table 1 indicate that students instructed with blended YouTube-videos had a pre-test average achievement rating of 12.36 with SD score of 3.24, and a post-test average achievement rating of 25.62 with SD score of 2.72, while their counterpart taught using conventional method had a pre-test average achievement rating of 11.07 with SD score of 4.56, and a post-test average achievement rating of 21.34 with SD score of 2.79. Mean gain scores of 13.26 and 10.27 were recorded for the two groups respectively. Suggesting that, students taught using blended YouTube-videos outperformed their counterpart taught using conventional method.

Question Two: Do students mean interest score in EE differ based on method of instruction?

Table 2. Descriptive Statistics for Interest Scores Based on Strategies

Instructional Strategies	N	Pretest		Post-test		Mean Gain
		Mean	SD	Mean	SD	
Blended Youtube-Video	78	20.96	3.56	40.85	3.69	19.89
Conventional Method	88	21.25	5.95	36.06	4.49	14.81

Result in table 2 suggest that students taught with blended YouTube-videos had a pre-test average interest score of 20.96 with SD score of 3.56, and a post-test average interest score of 40.85 with SD score of 3.39, while

their counterpart taught using conventional approach had a pre-test average interest score of 21.25 with SD score of 5.95, and a post-test average interest score of 36.06 with SD score of 4.49. Mean gain scores of 19.89 and 14.81 were recorded for both groups respectively. Demonstrating that, students taught using blended YouTube-videos had increase in their interest rating than their counterpart instructed using CM.

Ho1: Students mean achievement score in EE do not differs significantly based on method of instruction

Table 3. ANCOVA on Mean Achievement Score of Students by Methods of Instruction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	786.519[a]	2	393.260	52.749	0.000	.393
Intercept	8419.705	1	8419.705	1129.356	0.000	.874
Pre_test_A	31.018	1	31.018	4.161	0.043	.025
STRATEGIES	688.461	1	688.461	92.345	0.000	.362
Error	1215.216	163	7.455			
Total	92504.000	166				
Corrected Total	2001.735	165				
a. R Squared = .393 (Adjusted R Squared = .385)						

The analysis in table 3 highlight the probability value associated with the calculated value of F (92.35) for the effect of blended YTVR and conventional method on students' achievement mean scores is (0.00). Since the p-value (0.00) is less than (0.05) level of significance, the null hypothesis is therefore rejected. Implying that significant difference exists in the mean achievement scores of undergraduate student taught EE using blended YTVR and those taught using conventional method in favour of those taught using blended YTVR. In addition, the partial eta squared value of 0.362 suggest that the effect size of YTVR on students' achievement is 36.2%. Insinuating that 36.2% upswing in learners' achievement is credited YVR effect.

Ho2: students mean interest score in EE do not differs significantly based on method of instruction.

Table 4. ANCOVA on Mean Interest Score of Students by Methods of Instruction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1145.168[a]	2	572.584	35.729	0.000	.305
Intercept	16015.848	1	16015.848	999.395	0.000	.860
Pre_test_Inte	196.707	1	196.707	12.275	0.001	.070
STRATEGIES	922.670	1	922.670	57.575	0.000	.261
Error	2612.163	163	16.026			
Total	247353.000	166				
Corrected Total	3757.331	165				
a. R Squared = .305 (Adjusted R Squared = .296)						

The analysis in table 4 highlight the probability value associated with the calculated value of F (57.58) for the effect of blended YTVR and conventional method on students' interest mean scores is (0.00). Since the p-value (0.00) is less than (0.05) level of significance, the null hypothesis is therefore rejected. Implying that significant difference exists in the mean interest scores of undergraduate student taught EE using blended YTVR and those taught using conventional method in favour of those taught using blended YTVR. Similarly, the partial eta squared value of 0.261 is an indication that 26.1% upswing in learners' interest was as a result of YVR experience.

4. Discussion

This study affirms the pedagogical value of digital tools (blended YouTube-videos) in enhancing student academic achievement and interest in EE with its findings. The results demonstrated that students instructed environmental education (EE) with blended YouTube-videos had significantly higher achievement and interest compare to those taught with lecture method. Concepts in EE are best understood when visual presentation are deployed. Blended YouTube videos offer a dynamic and contextualized and individualized learning that textbooks or lectures alone may not effectively convey.

This finding corroborates with the findings of Mohammed and Ogar (2023), Noetel et al. (2021), and Edache-Abah and Dike (2019), whose findings suggest that student in exposed to YouTube-enhanced EE lessons scored significantly higher on achievement tests than their fellows. Also, Beji and Saidu (2021), Khan, Saeed and Anwar (2023) reported in their study a remarkable increase in students' academic achievement, especially in units involving pollution, biodiversity, and climate change using video instructions. According to "Khan *et al.,* (2023) students reported that videos made learning "more real" and "less abstract," leading to better conceptual understanding and memory retention". These synch in researcher findings is attributed to the richness of video instruction to activate most sense organs due to the multimodal nature of content. YouTube is a rich and free (Abdulhadi (2022), user-friendly, and enjoyable source of learning (Abu-Taieh *et al.,* 2022). On the contrary, "Edache-Abah and Mumini (2019) who investigated the effect of YouTube on performance of secondary school students in biology concepts found that the experimental group taught with YouTube videos did not perform better than the control group taught using conventional methods".

Also, Boateng *et al.,* (2016), Alobaid (2020) found that students had negative perceptions about videos instruction, and almost all the participants indicated that they had issues with it. DeCoito and Estaiteyeh (2022) found that with YTVR, teachers short change implementing creative and student cantered pedagogy with teaching subject content knowledge. Breslyn and Green (2022) found that the use of video to support online learning are declining among teachers. Similarly, Umoh (2024) found that YouTube videos are useful but raise a concern of content-credibility as well as being a potential distraction for students. These findings echo the fact that while YouTube appears to be a good pedagogical tool, its effectiveness depends on how its deployed.

Furthermore, the findings also aligned with the observations of Huang *et al.,* (2023), Azor *et al.,* (2020) who also reported in their study that use of YouTube videos in Environmental Science classes increased learners' curiosity and classroom participation by providing up-to-date real-world examples, especially concerning biodiversity loss and climate action. Similarly, Edache-Abah and Dike (2019) reported significant difference was observed in student ratings, with those in YouTube-supported Environmental Education lessons expressing greater enjoyment and interest than their counterparts in conventionally taught classes. Also, this finding aligned with the findings of Kwansawad (2021) who carried out a study to examine the impact of video reflection on EFL and reported that video reflection improve instructions delivery. This implies that video instruction improves both teachers and students' perspective. The relatedness of these findings was linked to the entertainment, immediacy, and personalized nature of multimedia video content in learning EE. Also, Noetel *et al.* (2021) analyzed 105 students who were exposed to videos learning in their university, reported that YTV instruction propmote students' interest and boost learning outcome.

On the contrary, Kassa, *et al.,* (2024) found that multimedia learning strategy like YTVR show no performance difference among the tutee in three learning style groups. In a similar report, tutees' use of YTV, were found to lower their learning outcome (Gong & Tao 2024). Kassa *et al,* (2024) stressed that technology alone cannot boost educational system. For example, EdTech alone cannot change an unskilled instructor into a skilled one by magic. Other issues of concern is the issue regarding YouTube content quality (Shoufan & Mohamed, 2022), knowing how to search YouTube to avoid returning videos from unknown and untrusted creators (Fyfield *et al.*, 2021), as well as student laziness to surf the space diligently and avoid popup views (Mohamed and Shoufan, 2022).

Evidently, majority of literatures support YouTube videos resources as a veritable educational tool due to its multimodal content that supports visualization, contextualization, and self-paced learning. However, most of these findings fails to acknowledge the limitation of this resource in Africa and Nigeria in particular. For instance, in higher institutions in Nigeria, due to infrastructural deficiency; poor internet connectivity, lack of access to computers, higher

cost of data and lack of electricity, students right to education and engagement in e-teaching and learning remain poor. Where the resources are available, sustainability becomes the main challenge obstructing its integration. Yidana *et al,* (2023), Umoh (2024) opined that Africa institutions need massive investments in digital infrastructure, skilled personnel in digital literacy, and policies to ensure equity in distribution and access for all learners.

5. Conclusion

The findings confirmed that students taught EE using blended YTVR demonstrated significantly an improved academic achievement and interest compared to their counterpart taught with CM. The findings corroborate with numerous studies acknowledging the effectiveness of multimedia instruction over conventional methods. It revealed further, the importance of leveraging multimedia tools such as YTVR in classrooms, for cognitive gains, for positive affective outcomes like interest. Hence, a call for educators and stakeholders to strategically develop and integrate high-quality video content into instructional design to jack up learning experiences, especially in courses with abstract contents like EE. When this is done, the full potentials of YTVR instruction will be properly harnessed.

5.1 Recommendations

The following are recommended:

1 Stakeholder in Education sector should redesign the curriculum to incorporate blended YouTube video-resources as an instruction delivery strategy in EE. When developed (instructive digital-videos) it will serve as complementary tools for classroom instruction, supporting visual and auditory learners and enhancing general conceptual understanding of concepts.

2 Teachers should be trained on digital literacy and video pedagogy, through workshops, conferences and seminars, to efficiently source, appraise and blend YouTube video-resources into instructional strategies.

3 Teachers should be encouraged to design learning tasks for students that require them to create or review YouTube videos, to foster content mastery, creativity, and digital communication skills.

5.2 Limitations of the Study

The researchers acknowledge some drawbacks that may have directly or indirectly influence the outcome of this study to include but not limited to.

1 By utilizing intact classes, the researchers acknowledge that there could be pre-existing differences among students and this may have introduce selection bias that could possibly influence the final outcomes.

2 Teacher variable and other extraneous classroom variables that may have also present potential threats to internal validity.

3 Another factor that would have probably influence the outcome of this study is the duration of the study. The treatment lasted for four weeks, which may not be enough to generalize that the improvement in their achievement and interest level was as a result of the treatment.

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Geoffrey Ukala: Conceptualization, Methodology, Investigation, Writing – Original draft, Supervision and Resources. Josephine Ese Konyeme: Methodology, Writing – Original draft. Folasade Oluyemisi Olayinka: Methodology, Writing – Review and Editing, Validation. Nsimeneabasi Michael Udoh: Supervision, Project administration, Formal analysis. Sunday Ayodele Taiwo: Formal analysis, Supervision. Oluwakemi Mogelola Anyanwu: Investigation, Writing – Original draft, Project administration. Abike Yemisi Ajibare: Methodology, Writing – Original draft. Adenike Margaret Dada: Writing – Review and editing. Akinbiyi Benard Ambode: Writing – Original draft, Writing – Review and editing. All the authors read and approved the final version of the manuscript.

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Ethical Considerations
This study-involved humans' participation, as a result, an approved was sorted and granted by the University of Nigeria, Nsukka committee on research ethics. The study was executed in line with the institutional regulations. The subjects were assured of confidentiality and anonymity, and they gave consent to fully join the project.

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