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June 2021

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Anyim, Wisdom Okereke, "Sustainable Development Goal on Quality Education: A Review of E-Learning Resources and Pedagogy in the University System" (2021). *Library Philosophy and Practice (e-journal)*. 5578.

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# **Sustainable Development Goal on Quality Education: A Review of E-Learning Resources and Pedagogy in the University System**

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## **Abstract**

The aim of this research was to review Sustainable Development Goal on quality education in line with e-learning resources and pedagogy that can be found in the university system. The review of the learning resources in the higher institution is based on the goal of the United Nations to build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all. Knowing that learning resources are vital part of quality education, the researcher identified different library e-learning resources, instructional learning tools and how they are employed in several cases. The study also looked at the advent of smart classroom which has turned classroom learning environment into the high-tech content, which creates an interactive classroom teaching efficiency for teachers and students in learning situations, promote the students' active learning and cooperative learning, and then improve the efficiency of pedagogy and outcomes of the students.

**Keywords:** Sustainable Development Goal, E-Learning, E-learning Resources, Pedagogy, University

## **Introduction**

In September 2015, the United Nations, through her General Assembly developed a 2030 blueprint for Sustainable Development that contains 17 agenda. The agenda were designed to give a clear road map for achieving sustainable development for all the member countries.

The Sustainable Development Goals are all inclusive as people of all backgrounds

including persons with disabilities are within the framework. The agenda were adopted in 2015 to cover 15-years lifespan (2030). At the targeted year, it is believed that all nations of the world would have been a better place for all. The Goals are meant to achieve a better and more sustainable future for all nations. They also focus on some of the global challenges which include poverty, inequality, climate change, environmental degradation, peace and justice (United Nations, 2021). The United Nations launched the Sustainable Development Goals that are arranged serially as follows:

GOAL 1: Ending of poverty in all it forms all over the world

GOAL 2: Eradication of hunger

GOAL 3: Ensuring good health and well-being for all people

GOAL 4: Ensuring quality education for all

GOAL 5: Promotion of gender equality

GOAL 6: Provision of clean water and sanitation

GOAL 7: Ensuring affordable and clean energy

GOAL 8: Creating decent work and economic growth

GOAL 9: Building thriving Industries, Innovations and Infrastructures

GOAL 10: Reduced Inequality to the barest minimum

GOAL 11: Building sustainable cities and communities

GOAL 12: Promoting responsible consumption and production

GOAL 13: Taking drastic action to combat climate change

GOAL 14: Judicious use of aquatic resources for sustainable development

GOAL 15: Management of land resources, mineral resources, forest reserve, animals for sustainable development

GOAL 16: Establishing strong institutions for peace and justice

GOAL 17: Promoting partnerships for implementation and compliance for achieving sustainable development goals.

### **Overview of Sustainable Development Goal on Quality Education**

Goal 4 of the Sustainable Development centers on quality education. This is based on the position education occupies in achieving a thriving future for all. Mkunbo (2016) opines that the aim of

goal 4 - Sustainable Development Agenda is to ensure inclusive and equitable quality education that promote lifelong learning opportunities for all people, irrespective of sex, age, race, ethnicity, vulnerable and people with disabilities or migrants. The goal caters for education at all levels - primary, secondary, tertiary, technical and vocational training and also from early childhood to adulthood. There are seven (7) targets the goal focusses on which must be achieved on or before the year 2030 according to United Nation (2015). These are enumerated below:

1. Ensuring that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.
2. Ensuring that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education
3. Ensuring equal access for all women and men to affordable and quality technical, vocational and tertiary education, including University;
4. Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship;
5. Eliminating gender disparities in education and ensure equal access to all levels of education, vocational training for children in vulnerable situation and disability people;
6. Ensuring that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy;
7. Ensuring that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity; and target
8. Building and upgrading education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all
9. 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

10. Substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and Small Island developing States

### **Actualizing Sustainable Development Goal (4) through the University Library Services**

The success of any educational policy hinges on the activeness of the library services. Library itself is an agent that enables education institution to meet the teaching, learning and research needs of teachers and learners. Therefore, Sustainable Development agenda on quality education receives strength through the power of information, knowledge provision and dissemination. Anyim (2021) acknowledges that the education sector in Nigeria has been in the revolutionary process to digitalize educational resources so that access to information becomes less cumbersome.

Emphasis on upgrading learning resources and facilities to make access to information easier or instruction more engaging has led to the deployment of emerging technologies in library services. On this note, transformation thrives on the way in which information is stored, retrieved, and disseminated; ensuring that those information resources that initially had their presence in printed formats can now be accessed electronically. As clearly pointed in Anyim (2020), there are different modes of academic programs in the institution of higher learning now, which include distance learning, continuing education and campus system. According to the Anyim, all these programmes require that the library provide divers learning and information resources that are virtual, electronic and analogue in nature to support research and scholarship holistically.

Upgrading education facilities as one of the targets of the SDGs also concerns with the universal access to information through virtual libraries to facilitate research by making knowledge available to researchers, training of professionals in different fields through the provision of information materials required for the academic programmes, dissemination of the existing and new information for the users, provision of information materials and provision of resources and research support for students and faculty (Anyim, 2020 and Anyim, 2018).

The contribution of library towards a sustainable development of the education sector has been tremendously felt during the emergency situations occasioned by the Covid-19 Lockdown

(Anyim, 2021). During the period, libraries resorted to using the mobile technologies for accessing, retrieving, sharing, and dissemination of information in order to ensure that the education sector does not suffer the effect of the lockdown or any other emergencies (Anyim, 2020). University Libraries are not lagging behind in the use of mobile technologies. They also leveraged on online learning method to facilitate information literacy and learning skills for students and other users.

The universities, through the libraries and other resource-based facilities have contributed conspicuously on sustainable development in Nigeria, by supporting education advancements, human resource development, business, entrepreneurial skills development, digital innovations, and gender equality. This brings a milestone that moved the perception of libraries as centers for mere passive and recreational reading, to active research institutions and socio-economic development agents (Anyim, 2021). A meaningful education policy cannot be achieved without a well-established library that drives the development of a nation by enhancing the cause of education and academic research for a better life of all. Soblaje and Ogunmodede (2015), affirmed that without libraries, no meaningful educational effort can be carried out, as library services improve knowledge and skills for positive productivity and as a tool for economic revival. On that note, Orji and Maekae (2013) stated that the level of development of any nation is measured by the level of its achievement in education. The library improves the well-being of the citizens and that of a nation at large.

The library provides services to students and staff in many ways. Anyim (2016) stressed that through various sections, the library attends to users' queries, undertakes Selected Dissemination of Information (SDI), carries out Current Awareness Services, lending services, information literacy, research assistance, collaborations and so on. The University Library subscribes to some databases according to the programmes of the University. Access is via the virtual library. To assist students make maximum use of the Library, the Library publishes a brochure which provides periodic information as well as taking students, especially new students through an orientation of the services available in the Library and how to access them. Members of staff are encouraged to register in the Library in order to avail themselves of the services available in the University Library (Rhema University Library Brochure, n.d).

## **Actualizing Sustainable Development Goal (4) through Adoption of Improved Classroom**

There is education revolution going on in Nigeria. This stems across the length and breadth of the university. Rhema University Nigeria defines the revolution in the following manner “It’s about the head and heart going to school together, and raising great young people who will become standards wherever they go”. This has led to several transformation in the area of learning resources, pedagogy and programmes that supports Sustainable Development Goals on Quality Education (Rhema University Brochure).

### **Smart Classroom**

Smart Classroom is a setting that incorporates electronic devices and software into the learning environment. Typically, it is a digital classroom where a physical classroom extends into a digital space. This digital environment makes it possible for users to collaborate or continue their work outside the classroom. A smart classroom is technological-based which dwells on integrated multimedia software and ICT resources to function. Students find it engaging and easy to access learning resources, networks and track their learning progress. Instructors also find it resourceful in highlighting students’ work in a smart classroom. In an interview with students in Rhema University Nigeria, smart classrooms utilize educational applications and webpages, hardware, software, operating systems and social media channels to enhance student learning. It also utilizes feedback which help the students receive input from their lecturers so easily without delay. Smart classroom facilitates customization of feedback based on student, lesson, group and more.

The Sustainable Development Goal 4, Target 8 emphasized on education facilities, that is to build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all (United Nations, 2015), which institutions of higher learning has embraced by adopting classroom environment that will enhance students’ learning experience. Smart classroom contains the features of intelligent technology, intelligent application, and wisdom management (John, Izang and Awolabi (2018). The emergence of these new technologies will have a profound impact on our teaching

environment, teaching mode, teaching content, evaluation mode and management mode and so on (Li and Yang, 2013). The use of ICT-based instructional strategies is in conformity with global best practice. It repositions instructional model from lecture to student-centred instruction, thereby increasing all forms of interaction and incorporating formative and summative assessment.

### **E- Learning Pedagogy**

The idea of e-learning or virtually learning, was painted clearly in Anyim (2019) who observed that learning is no longer confined to the bricks and walls but can take place without physical barriers such as time and distance so far as web-based databases, software and other digital facilities are available. E-learning can be defined as a learning method devoid of paper printed instructional material. E-learning is the use of telecommunication technology to deliver information for education and training (Goyal, 2012). Meanwhile, with e-portals, digitalized course contents can be accessed from any Internet-enabled device, allowing teachers to meet with students at any location in cyberspace. Every academic staff has a preferred teaching method which suit his or her personal style and discipline area. As opined by Border, Stoudt and Warnock (2006), the carefully considered integration of e-learning tools can improve these pedagogic approaches and enable varied and improved interaction with students at all levels, both on and off campus.

According to Naidu (2006), the term E-learning comprises more than online learning, but incorporates all educational activities that are carried out by individuals or groups working online or offline. In order to achieve a greater learning experience, Biggs (2002) suggested that combination of all aspects of our teaching, from learning outcomes through teaching methods to assessment, is vital to ensure the continued quality enhancement of the learning experience we offer to students. On this note, e-learning needs to be viewed as a fully integrated component of the whole educational process. Border, Stoudt and Warnock (2006) dwell on Fowler and Mayes (2000) to explain how learning relationships can enhance the conceptualization and re-conceptualization cycle which facilitates deep understanding of the learners. They describe how interactive courseware and online discussions can play a major role in supporting these cognitive processes by engaging the learner in meaningful dialogue with tutor and peers. Laurillard's Conversational Framework (2001) also illustrates the importance of communication in the learning process and highlights a series of actions and interactions which can be supported to varying degrees by new technologies. (Glasgow Caldonian University, 2004)

Multimedia resources occupy a prominent place in e-learning systems which require a

high-bandwidth network for efficient content access. In some situations, e-learning serves as an alternative to traditional classroom learning, which is especially beneficial to remote and lifelong learning and training. On the other hand, e-learning can significantly complement classroom learning order than replace it. Since the Covid -19 pandemic outbreak, e-learning has become a normal and indispensable pedagogy in academic and professional education. Universities and other higher institutions are constantly exploring to create more appealing and effective online learning environments by integrating appropriate pedagogical methods, to enhance system interactivity and personalization, and to better engage learners. (Goyal, 2006 and Zhang, Zhao, Zhau and Nunamaker, 2004).

Mohammed (2021) outlines the e-learning pedagogical approaches that can facilitate teaching, learning and research activities in the university as follows:

- (i) Assessment of students' learning which is an essential component of effective teaching and learning in the online environment
- (ii) Writing assignments including short essays, research papers, case study responses which are some of the examples that be derived from e-resources. Students can search for review and information on an assignment electronically. Faculty on the other hand can assign students to small groups to provide peer feedback and build community.
- (iii) Asynchronous discussion activities which take place within e-resource platforms. An instructor can initiate class discussions with a set of questions. This can be achieved via the Learning Management System (LMS)
- (iv) Provision of a visual representation of connections between concepts for students learning, labelled links and show relationships between concepts. It is a good approach for formative assessment to evaluate student's knowledge at certain checkpoints in the course, and;
- (v) Students' presentations which can be modified to the online learning environment. Students can create presentations (i.e., slide deck or poster) to present to instructor and classmates online and receive instructor and peer feedback.

## **E-Learning Tools**

E-learning tools encourage student collaboration; improve team working skill and independent thinking. Many of the developing e-learning tools encourage student motivation and desire to remain in online educational environments. The online learning community offers a wide array of e-learning tools. The e-learning educators and developers need to determine which tools fit a particular pedagogical need before deciding on which tool to incorporate into the e-learning strategy. As educators, it is paramount to recognize that there isn't one single tool that brings e-learning to life. E-learning requires three categories of tasks that e-learning tools must perform for it to be considered effective. Border, Stoudt and Warnock (2006) described three categories of tasks that e-learning tools must cover as follows:

### **Category 1**

#### **Create:**

This involves creating curriculum consisting of locating and integrating separate courses into a coherent sequence or other structure; creating courses requires integrating separate clusters and pages of content as well as providing overall navigational mechanisms such as a table of content or index; creating lessons requires selecting and linking pages or other objects into a coherent navigational structure. creating pages requires entering text and integrating it with graphics and other media. It may also include inserting cross-reference hypertext links and creating medial components requires creating the individual pictures, animations, sound, music, video sequences, and other digital media.

### **Category 2**

#### **Offer:**

Offering or hosting curriculum and setting up online schools which involves presenting the collections of courses to learners in ways that show relationships among the individual products and perhaps tracks which the learner had accessed or completed; offering individual courses which are ways of making courses available to learners as a coherent whole. It may also require tracking the parts of the individual courses they have accessed and completed; offering lessons which involves the ability to present multiple pages or other components as a coherent whole; offering individual pages which involves dispatching pages to learners as requested and offering media

components which involves supplying media as requested. It may also involves storing them economically and streaming them efficiently.

### Category 3

#### Access

This involves accessing collections by enrolling or subscribing to them; accessing individual courses which involves the capability to open the course for display, choose from its lessons, and navigate among them; accessing pages which involves a way to request them and to display them when they arrive; accessing pages which involves a way to request them and to display them when they arrive and accessing media components which involves the ability to play or display the individual media.

#### Example of Instructional E-Learning Tools and their Uses

<b>Tools</b>	<b>Description</b>
Assessment Tool	This includes forms, templates, and technologies for measuring performance of the students
Hybrid/Blended Course	This involves online and face-to-face presentation of course curriculum to facilitate teaching and learning activities
Workshop and Training Material	Materials used in a workshop setting for the purpose of professional and career development
Presentation Tool	Teaching materials (text and multimedia) that are used to present curriculum and concepts to learners. Example: Projector, PowerPoint etc.
Development Tool:	Software development applications platforms for authoring technology-based resources. Example: websites, learning objects, apps, etc.
Animation	Successive drawings that create an illusion of movement when shown in sequence. The animations visually and dynamically present concepts, models, processes, and/or phenomena in space or time. Users can control their pace and movement through the material typically, but they cannot determine and/or influence the initial conditions or their

	outcomes/results. Animations typically do not contain real people, places or things in movement
Simulation	Demonstrate a real or imaginary experience where users' actions affect the outcomes of tasks they have to complete. Users determine and input initial conditions that generate output that is different from and changed by the initial conditions
Tutorial	Users navigate through a set of scaffolded learning activities designed to meet stated learning objectives, structured to impart specific concepts or skills, and organized sequentially to integrate conceptual presentation, demonstration, practice and testing. Feedback on learner performance is an essential component of a tutorial
Quiz/Test	This is used to assess or evaluate the knowledge or skills of students
Authorware	Used for creating online training. You can reduce learning time and speed development with the familiar Macromedia user interface.
Horizon Wimba	A versatile e-learning tool that allows for dual-way live voice and video for real-time classrooms and interaction between student and teacher. It also incorporates a public and private chat
LeanLinc	Used for real-time video and audio conferencing or classroom presentations and participation
Macromedia Breeze	A synchronous e-learning tool that contains a course and content management, integration with other software including other Macromedia products. Breeze also has the survey feature, you can also record the sessions, set up meeting rooms, share applications and use whiteboards, use of a camera is supported as well as real-time verbal communications
Saba's Centra	A synchronous e-learning tool that can be utilized for web seminars and virtual meetings. Some of the features associated with Centra are real-time interactivity, allowing student and teacher, or two corporations to connect and meet with each other, as if in the same room. There is a whiteboard available for interactivity, you can poll students, or the students can raise their hand, there is a text chat, as well as the

	microphone feature which allows one to talk instantly and another to give instant feedback verbally.
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### **Library-Based E-Learning Resource**

To discuss the advancement that has taken place in the university learning resources, we can recall that university hitherto was made up physical resources both in the library and classroom. This prevailed until the advent of technology. The revolution came with innovations and changes that shifted attention from collection of physical information resources and analogue mode of instruction to documents and instruction created and distributed in electronic form.

To adjust to the present situation, libraries have shifted towards new media that is, electronic resources for their collection developments, combined with physical books. The library provides users access to different kinds of information resources in print and electronic formats to support teaching, learning, research, and other academic activities (Anyim, 2021). An electronic resource requires computer access or any electronic product that delivers a collection of data, be it text referring to full-text bases, electronic journals, image collections, other multimedia products and numerical, graphical or time-based, as a commercially available title that has been published with an aim to being marketed. These may be delivered on CD ROM, on tape, via internet and so on (Mohammed, 2021).

It is understood, that inclusion of electronic resources in the library does not render physical resources useless but it makes a library more fit to meeting diverse needs of the users. Mohammed (2021) opined that, a well-equipped library is the that comprises physical and e-resources which are rich in content for easy access within the university library and outside the university library, and also that it must provide access to quality resources and innovative services to stimulate creativity, intellectual curiosity and to facilitate lifelong learning and research within its community. Electronic information resources have garnered very much attention due to several benefits that associate with it in a manner that makes access, manipulation and searching of information easier; acquisition of information resources faster and storage and maintenance convenient. In the same vein, due to the several advantages of electronic information resources such as their timeliness, search facilities, remote access and up-datedness, they have become more indispensable after the arrival of the Internet in the academic environment (Muhammed, 2021).

The provision of electronic information resources in tertiary institutions of learning is a new way of gaining quick access to a great number of research information globally (Ekong and Ekong 2018).

### Example of Library Based E-Learning Resources

<b>Learning Resources</b>	<b>Resources' Description</b>
Text book	Material that expatiates concepts and advances knowledge on a particular course or subject for deeper understanding
Journals	Materials that record research findings or observation. Users need it to ascertain current happenings or development in a particular field of study
Reference Materials	Material used for a specific and authoritative information or fact.
Audio CDs	These are learning resources that contain recorded voice or sound used for learning to facilitate students' learning experience (Anyim, 2019)
Video CD/DVD	These contain recorded moving visual images that show real people, places and things that enable students to learn skills or knowledge. The tool helps in demonstrating practical and abstract concepts (Anyim, 2019)
OPAC	Online Public Access Catalogue enables researchers to see the holdings of the library and location where such resources could be found on the shelves. For registered users who are not physically present in the library, they can through the OPAC access what resources are available in the library (Anyim, 2019)
Social Networking Tool	Collaborative tools and applications that enable users to connect and communicate with others for the purpose of sharing information, e.g Facebook, Whatsapp, Linkedin, Google scholar, Researchgate etc.
Database	This contains online information resources that is available on the Internet.

Photographic Image	Photographs or images of real people, places or things that visually presents concepts, procedures and phenomena that help students to learn skills or knowledge.
Illustration/Graphic	Material that presents visual concepts, models, and/or processes (that are not photographic images) that visually present concepts, models, and/or processes that enable students to learn skills or knowledge. These include diagrams, illustrations, graphics or infographics in any file format including Photoshop, Illustrator and other similar file types.
E-Portfolio	A collection of electronic materials assembled and managed by a user. These may include text, electronic files, images, multimedia, blog entries, and links. E-portfolios are both demonstrations of the user's abilities and platforms for self-expression, and, if they are online, they can be maintained dynamically over time. An e-portfolio can be seen as a type of learning record that provides actual evidence of achievement.

## Conclusion

Study reveals that there will be no sustainable development in any society without a quality education. United Nations Sustainable Development Goal on quality education has so far sharpened the nations' commitment in developing education sector leading to improved human development, skill improvement and gender equality. Quality education plays important roles in shaping people's attitude, critical thinking and helping them make informed decisions. To achieve United Nations Sustainable Goals on quality education, teaching pedagogy has to be improved together with the learning resources that accommodate flexibility and ease of access. This is the reason university in Nigeria and other institution of higher learning have embarked on educational revolution that brings in innovation of teaching with the 21<sup>st</sup> Century facilities, learning resources and improved pedagogy in order to train both the head and the heart so that the students can graduate and become useful to the society and the world.

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