EXAMINING IMPACT OF E-LEARNING ON SUSTAINABLE EDUCATIONAL DEVELOPMENT IN SUB-SAHARA AFRICA (A CASE STUDY OF NIGERIA)

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Abstract

With the emergence of the corona virus pandemic, there is an increase in the need for online learning or e-learning in African countries. Also, it is essential to discover the benefit and the chemistry that create the action for global development. The Sustainable Development Goals fashioned by the United Nations support that all learners will have the understanding and skills required to promote sustainable development. This research paper engaged with the qualitative method by consulting secondary data from published articles, journals, educational libraries, the internet, and other institutional reports. At the same time, content analysis reports all the data from various sources. Africa needs to understand the values placed on the different online learning moods. This is essential for sustainable educational development to be realized. Actions and other critical needs must be incorporated during the sustainable development and the enhancement of global citizens. The paper concludes and recommends that the various governments in Africa especially in Nigeria need to invest more in online learning and promoting sustainable development. The engagement of multiple stakeholders and other actors in realizing sustainable educational development must join hands together to make learning easy and accessible to all in Nigeria and Africa as a whole.

Keywords: Online learning, COVID-19, Education, Sustainable Development, Nigeria

Introduction

The World Health Organization (WHO) declared a global COVID-19 pandemic on 11 March 2020 after observing that most countries had reported thousands of confirmed COVID-19 cases.[1] By July 2020, in Africa, countries that were most affected were Algeria. Egypt, Ghana, Nigeria and South Africa, with South Africa accounting for more than 70% of all cases on the continent.[2] The number of cases continued to increase across the globe, with Africa predicted to be the most vulnerable continent to the coronavirus.[3]

On 27th February 2020 the Federal Ministry of Health in Nigeria announced the confirmation of the first case of Corona virus disease in Lagos State, Nigeria. In the same communication the Honourable Minister of Health announced that the Multi-sectoral Coronavirus Preparedness Group led by the Nigeria Center for Disease control (NCDC) has immediately activated its National Emergency operations Center. Since then, in less than 2 months, Nigeria has reached more than 50 cases across the country. NCDC keeps and updates figures daily. On March 19th, 2020 a circular6 from Federal Ministry of Education has granted an approval for the closure of all school for a period of one (1) month commencing from Monday 23rd March 2020 to prevent the spread of the Corona virus (COVID19).[4]

Online e-learning is described as learning experiences using various electronic devices (e.g. computers, laptops, smartphones, etc.) with internet availability in synchronous or asynchronous environmental conditions. Online e-learning could be a platform that makes the process of education more student-centered, creative, and flexible.[5] Online delivery of courses is cost-effective and easily accessible especially when delivering curriculum to students in rural and remote areas.[6] The United online e-learning is seen by the United Nations (UN) and the WHO as a helpful tool for meeting educational needs, especially in developing nations.[7] For instance, in Egypt, Medical colleges have implemented numerous creative strategies to combat the crisis, using various software/apps such as Google Classroom, Zoom, and Microsoft Teams to take online courses. In order not only to complete the course but also to stay in constant contact with

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[1] World Health Oganisation. "*Coronavirus disease (COVID-19) outbreak situation".* Geneva: World Health Organisation, 2020

[2] OECD. "COVID-19 in Africa: Regional Socio-economic implications and policy priorities. OECD". 2020. Retrieved from https://www.oecd.org/coronavirus/ policy-responses/covid-19-and-africa-socio-economic-implications-and-policy-responses96e1b282/ (Accessed on 10 October, 2021)

[3] World Economic Forum. "*Why Sub-Saharan Africa needs a unique response to COVID-19".* World Economic Forum. 2020

[4] Nlebem, "*Federal government orders closure of all schools in Nigeria as coronavirus spreads. 2020.* Retrieved from https://businessday.ng/coronavirus/article/fg-orders-closure-of-all-schools-in-nigeria-as-coronavirus-spreads/ (Accessed on 18 October, 2021).

[5] Singh and Thurman, A. "How many ways can we define online learning? A systematic literature review of definitions of online learning (1988–2018)." *Am Journal of Distance Education, vol.33, no.*4 (2019): 289–306

[6] Dhawan, "Online learning: A panacea in the time of COVID-19 crisis." *Journal of Educational Technology System,* vol.49, no.1 (2020): 5–22

[7] Colace, De Santo and Pietrosanto "Evaluation Models for e-Learning Platform: An AHP Approach. Frontiers in Education Conference, 36th Annual. San Diego, CA: Institute of Electrical and Electronics Engineers; (2006):pp.1–6.

the learners, this virtual class of e-learning was initiated to grow the certainty and confidence of the students in their faculty during the COVID-19 pandemic.[8]

The need for E-learning in Nigeria is an important issue for several cogent reasons. Firstly, the vast majority of the population lives below poverty level. They are unable to attend urban based institutions and thus remain deprived of higher education despite their superior merit. Secondly, those who joined workforce without completing their studies or education due to family commitments are unable to combine their work with studies and very few of them who have strong desire for higher studies could not do so because of the limited offer in the traditional institution of higher learning. Thirdly, the tradition of childhood, early marriage and religious belief in the country deprives the majority of female population from higher education. Besides, there are some other usual factors like physical disabilities, remoteness of localities, exorbitant tuition fees in most privately owned Universities and so on. These are some of the major issues responsible for why millions of Nigerians are deprived of higher education despite their knee interest and eligibilities. E-learning provides avenues for higher education for such a vast under-privileged population. Africa and Nigeria is generously endowed with human resources that need to be well equipped with literacy and skills to contribute to economic development, which is badly needed for this country.[9] Thus, it is crystal clear that the way forward is to embrace e-learning using both hands and supported by all necessary financial and infrastructural commitments. Therefore this paper will examine the impact of e-learning on sustainable educational development in sub-Sahara Africa (a case study of Nigeria).

Objective of the Study

The aim of this study is to assess impact of e-learning on sustainable educational development in sub-Sahara Africa (a case study of Nigeria). The specific objectives of this study are to:

I.   identify the conceptual issues on e-learning on sustainable educational development in Nigeria;

II. discover the impact of e-learning on sustainable educational development in Nigeria;

III. identify challenges facing implementation of E-Learning in Nigeria

IV. discover the recommendations to improve e-learning for sustainable educational development in Nigeria.

Methodology

The design of this study is qualitative in nature. This design derives data essentially from secondary sources. The choice of this study design is informed by the fact that it enables a researcher to obtain data in various literatures which can be utilized in achieving the objectives of the study. Also various data collected through secondary sources such as publications, books, journal articles, newspaper articles, and the library were analyzed through content analysis.

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[8]Kaur, etal, "Study of the effectiveness of e-learning to conventional teaching in medical undergraduates amid COVID-19 pandemic." *National Journal Physiology Pharm Pharmacology, vol.10*, no.7 (2020):1.

[9]Ajadi, Salawu and Adeoye. "E-learning and distance education in Nigeria. *The Turkish Online Journal of Educational Technology*, vol.*7*, no.4 (2008):1-10

Theoretical Framework

Constructivism, a learning theory that emerged in the early 1990's, rejects the objectivist view of reality and the idea that simply "communicating content to students will result in learning",[10] the "shovel ware" approach reflected in some distance education courses.[11] Constructivism would reject a linear, teacher-dominated instructional plan that defines learning objectives in advance in culminates in an objective assessment of observable behavior. Rather, it takes the view that each learner constructs his or her own subjective reality (i.e., creates meaning) through active engagement with the environment, the content, the teacher, and other learners. In Vygotsky's social constructivism, a community of learners, through their interactions and negotiations, may develop a largely-shared view of reality while recognizing the existence of a diversity of perspectives. Constructivism is focused on individual learning (meaning-making) rather than upon teaching; the instructor's role changes from being a conveyor of knowledge to one who facilitates (but does not completely control) an educational "transaction" promoting the development of the learner's thinking skills.Evaluation of learning is continuous, and is carried out by both the teacher and learner; learning how to evaluate one's own cognitive development (the highest of Bloom's "pyramid" of educational objectives) is an integral part of the learning process.[12]

Constructivist teaching strategies carry with them labels such as "collaborative" or "cooperative" learning, "learning communities," "problem-based," "discovery," and "hands-on" learning, all of which can be used to describe the online learning by students. The type of learning that has characterized the e-learning process from its inception is now beginning to become part of the educational mainstream.[13]Whileconstructive principles characterize the wide-ranging graduate seminar in humanities; it can also be found in science and engineering education, where it can be found in the laboratory, computer simulations, and group work, where students are encouraged to build their own concepts.[14] This theory is the main fulcrum of practical e-learning method and a great essence of practicum pedagogy.

E-Learning and Sustainable Educational Development in Nigeria: A Discourse

While online learning has long preceded COVID-19,[15]and has been growing steadily for more than a decade,[16]the advent of COVID-19 all over the world has resulted in rapid re-

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[10] Jonassen, D. *"Technology as cognitive tools: Learners as designers."* ITForum Paper #1. 1994. Retrieved from the University of Georgia College of Education Instructional Technology Forum Website: http://it.coe.uga.edu/itforum/paper1/paper1.html. (Cited in Pedagogy, Learning theories 12) (Accessed on 5 June, 2021).

[11]Jonassenet al. "Constructivism and computer mediated communication in distance education." *The American Journal of Distance Education, vol.9*, no.2 (1995):7-26

[12]Garrison, "A cognitive constructivist view of distance education: An analysis of teaching-learning assumptions." *Distance Education vol.14*, no.2 (1993):199-211

[13] Aderonmu, *"A Framework for Sustainable Education in Nigeria: Strategies of Re-integrating Vocational Skills into Educational Curriculum."* Department of Architecture, Covenant University, P.M.B 1023, Ota, Ogun State. 2012

[14] Wankat and Oreovicz,(n.d.). "*Teaching engineering."* Lafayette, Indiana: Purdue University. Electronic version; 285-288

[15]UNESCO, "*United Nations Decade of Education for Sustainable Development (2005- 2014): International implementation scheme.*" Paris: UNESCO. 2005.

orientation[17]of the education system from a face-to-face mode to up scaled online teaching.[18] Following the COVID-19 outbreak, one common trend in education systems globally has been to respond to the pandemic with emergency online protocols, marking the rapid transition of face-to-face learning to online learning systems. According to Moore et al.,[19]online learning is commonly described as providing "access to learning experiences via the use of some technology" (p. 130). 'Wholly online learning', according to Oblinger and Oblinger,[2020]encompasses a range of technologies such as the worldwide web, email, chat, new groups and texts, audio and video conferencing delivered over computer networks to impart education.[21] The fundamental change to online mediation has had a dramatic impact on the relationship between teachers and learners. Online pedagogy now focuses on the activities of the learner and sees teaching primarily as a means of support, with the teacher as a facilitator.[22]

In terms of Sustainable Education for Sustainable Development (ESD) implementation, Mireku[23]indicated that the use of ICT lends itself to more learner-centred settings, enabling students to collaborate with their peers and engage more deeply with content and practical skills. Willis, Weiser and Kirkwood,[24]observed that educators can integrate technology and media in ESD through activities that encourage children to explore, create, solve problems, communicate, collaborate, investigate, and demonstrate their learning about the world outside their classrooms. However, despite policy emphasis and the benefits that ICT can offer to ESD, before COVID-19, not all educators had made the shift from traditional conventional ways of teaching to the use of ICTs as teaching and learning tools. Where ICTs are used, there are many challenges. This can be attributed to factors such as inadequate infrastructure and lack of capacity. Too often, online facilitators do not take their lesson preparations as seriously as they could, and this lack of commitment has a profound and negative effect on the quality of online learning. Moreover, the learner is challenged to own, manage and schedule their learning.[25] This can be a difficult task

[16]Moore, Dickson-Deane and Galyen, "e-Learning, online learning, and distance learning environments: Are they the same?" *The Internet of Higher Education,* vol. 14, (2011):129-135.

[17] UNESCO. "*Proposal for a global action programme on education for sustainable development and follow-up to the United Nations Decade of Education for Sustainable Development (DESD) after 2014.* Paris: UNESCO. 2015

[18] Mireku, "*The impact of Information and Communication Technology (ICT) on effective teaching of Environmental Education in rural high schools."* Unpublished Master's thesis. South Africa: University of Fort Hare. 2016.

[19]Moore, Dickson-Deane and Galyen,"e-Learning, online learning, and distance learning environments: Are they the same?" *The Internet of Higher Education,* 14, (2011): 129-135.

[20]Oblinger and Oblinger,*"Educating the next generation."* EDUCAUSE. 2005. Retrieved from http://net.educause.edu/ir/library/pdf/pub7101.pdf (Accessed on 12 May, 2022)

[21]Dhull and Sakshi, "Online Learning*." International Education & Research Journal, vol.3, no.*8, (2017): 32-34

[22] UNESCO. "*United Nations Decade of Education for Sustainable Development (2005- 2014): International implementation scheme."* Paris: UNESCO. 2005.

[23]Mireku,"*The impact of Information and Communication Technology (ICT) on effective teaching of Environmental Education in rural high schools."* Unpublished Master's thesis. South Africa: University of Fort Hare. 2016

[24]Willis, Weiser and Kirkwood, "Bridging the gap: Meeting the needs of early childhood students by integrating technology and environmental education." *International Journal of Early Childhood Environmental Education,* vol.2, no.1, (2014):140-155.

[25]Mtetwa, "*Delivering the Bachelor of Education degree program in science, mathematics, and technology education through an open distance and electronic learning model: Experiences from the University of Zimbabwe".* In D. Mtetwa & C. Dirwai (eds.), Open Distance and Electronic Learning (ODel) and the Bachelor

for some students who, for the first time, may be experiencing the ability to control what was typically controlled by the facilitator.

The idea of e-learning or virtually learning, was painted clearly in Anyim[26]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.[27] 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 suits his or her personal style and discipline area. As opined by Border, Stoudt and Warnock,[28] 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,[29] 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, researches 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.[30] On this note, e-learning needs to be viewed as a fully integrated component of the whole educational process. Border, Stoudt and Warnock,[31]dwell on Fowler and Mayes[32]to explain how learning relationships can enhance the conceptualization and reconceptualization 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.[33]Laurillard's Conversational Framework,[34]also illustrates the importance of communication in the learning process and

of Education Degree at the University of Zimbabwe. (In Press). Harare: Department of Science Design and Technology Education, University of Zimbabwe. 2020.

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

[27]Goyal S,. "E-Learning: Future of Education. *Journal of Education and Learning, vol.6*, no.2, (2012): 239-242.

[28] Border, J.; Stoudt K. and Warnock, M. "E-Learning Concepts and Techniques E-Learning Concepts and Techniques." Institute for Interactive Technologies, Bloomsburg University of Pennsylvania, USA. 2006. Retrieved form https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/E%20learning%20%20 (2).pdf

[29] Naidu, "E-Learning: A Guidebook of Principles, Procedures and Practices, 2nd Rev. ed., CEMCA. 2006.

[30]Cacciamani, et al. Effects of a social tutor on participation, sense of community and learning in online university courses. *British Journal of Educational Technology*, *50*(4), (2019).1771-1784.

[31]Border,Stoudt and Warnock, "E-Learning Concepts and Techniques E-Learning Concepts and Techniques." 2006. Institute for Interactive Technologies, Bloomsburg University of Pennsylvania, USA Retrieved form https://engineering.futureuniversity.com/BOOKS% 20FOR%20IT/E%20learning%20%20 (2).pdf

[32]Fowler and Mayes. "Learning relationships from theory to design". Vol. 7. No.3. (1999): 6-16

[33] Anyim, "E-Lawyering and Virtual Law Practice: A Paradigm Shift for Law Library System Library Philosophy and Practice (e-journal)." (2019): 2904. Retrieved from https://digitalcommons.unl.edu/libphilprac/2904 (Accessed on 20 October, 2021).

[34]Laurillard, "*Rethinking university teaching: A framework for the effective use of educational technology.*" Routledge, London. 2001.

highlights a series of actions and interactions which can be supported to varying degrees by new technologies.[35]

Impact of E-Learning on Sustainable Educational Development in Nigeria

E-learning as a construct is a pertinent ICT tool in the digital regime of education often required for competitive productive development. It is inclined to the learning theory of constructivism. Constructive learning is a process in which students 'construct' meaning based on prior knowledge and experience. E-learning as a tool enables the building of mental models or schemes which in turn provide meaning and organisation to subsequent experience, unlike the traditional didactic method 'of teaching since education in the digital world is now learner centred. E-learning ensures that knowledge is created through an active process in which the learner transforms information, constructs hypothesis and make decisions using mental models.[36]This is in conformity with technology learning tools of ICT. The following are some of the impact of E-learning on sustainable educational development in Nigeria:

1. provide a wider access to education generally but specifically in University education in Nigeria.
2. ensure equity and equality of opportunities in education
3. enhance education for all and life-long learning
4. provide the entrenchment of global learning culture
5. provide instructional resources via an intensive use of ICTs
6. provide flexible, but qualitative education
7. reduce the cost, inconveniences, hassles of and access to education and its delivery viii enhance more access to education.

Innovation in educational technology enhances strategies such as crossover teaching, a comparative understanding of learning that bridges formal and informal settings. Similarly, in flipped classrooms, it blends learning as it focuses on student engagement and active learning and gives the instructor a better opportunity to deal with mixed levels, students' difficulties and differentiated learning preferences. It develops teaching and learning through virtual reality. Virtual classroom is applied in education for augmented reality and mixed reality generated on computer (https:/en.m.wikipedia.org). Teaching through 3D printing technology is described by Nisha,[37]as a technology wherein you can print objects and makes teaching engaging and gives wider scope for experimentation. These reflect few of the benefits of innovative teaching activities in Africa.

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[35]GlaskowCaldonian University. "*E-Learning Guides.*" 2004. Retrieved fromhttp://www. Learning services. gcal.ac.uk/ apu/eguides/intro.pdf (Accessed on 30 October, 2021).

[36]Bates, *"Managing Technology Changes Strategies for University and College Leaders".* San Francisco. Jersey Press. (2010).

[37]Nisha, *"How is 3d printing going to change education?"* 2017. Retrieved from www.quora.com (Accessed on 13, May 2022).

Challenges Facing E-Learning and Sustainable Educational Development in Nigeria

According to Mogboh,[38]Africa, and also in Nigeria, there are contending challenges facing the implementation and use of E-learning:

1. Unstable Energy Supply: There is no steady substantial sustainable energy/electricity supply to enhance or support ICT usage. This is nowhere to be found in rural areas. Energy is linked up with provision of Wi-Fi facilities or energy points to charge electronic gadgets.

2. Covid-19 pandemic induce stress, poverty and ill-health. The pandemic has deluded our mindset with gloomy and characterizations of various forms of depressive moods. Negative phenomena such as ill-health, lack of food and other basic amenities like cleanwater, drugs/hospitals, lack of information to alleviate these issues compound the lack of interest in digital knowledge and usage. Generally, the communication network is poor and inaccessible especially in rural areas.

3. Lack of funds: This goes with lack of infrastructure for digitalization of schools and organisations. Schools are bereft of such ICT facilities, even radios in hinterland schools. Students cannot afford to buy android phones much less a laptop. It is hoped the Federal Government announced palliatives for the schools during this pandemic will contain the provision of ICT materials. Some schools which provided online teaching/learning could not cover all its students because they could not afford to buy the gadgets nor credit data to access such facility.[39]

4. Governments non democratization policy of digital learning. Although the curriculum stipulates computer education but this has not been matched with accompanying digital installations and supplies in schools. There is even a dearth of technical support staff to

5. Poor teaching method. Teachers are rooted to the traditional classroom methods of physical constructivist organization of teaching and learning through oral lectures. The use of virtual classrooms and blended lectures are yet to be ingrained in the methodology of teaching and learning.

6. School management cadre's lack of zeal in implementing e-learning policy guidelines. There is a general lack of interest across the management cadre of the education system. This is because of lack of knowledge and a motivating factor to learn.

7. Lack of skills on technology: Doubt on the reliance of technology by the older generation for an entire course. Likewise, the fear of change due to a fixed mindset from the traditional way of doing 9 things that is the fear of the unknown from the known which is usually the case when you are introducing a novel technology.

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[38]Mogboh, "*E-learning as a new construct of sustainable educational delivery in Nigeria*" 19th AARD E-Conference, Ignatius Ajuru University of Education, Port Harcourt, July 13th – 16th, 2020.

[39]Zalat, Hammed and Bolbol, "The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff." *PLoS ONE vol.16,* no.3, (2021): e0248758.

Conclusion

It is evident that COVID-19 exposed inequalities among students in institutions of learning as observed from the Nigeria. The pandemic further exposed that ICT and ICT infrastructures are essential for teaching and learning. The pandemic has revealed that although technology mediation is now a common practice in educational institutions there is little evidence of significant impact on teaching and learning practices, therefore giving the various institutions of learning an opportunity to rethink their delivery systems and approaches to enhance quality. This change will not happen quickly and there is scope to mediate teaching and learning differently for sustainable educational development to be achieved.

Recommendation

The following recommendations are outline for the achieving sustainable educational development through the online learning in Nigeria:

1. With good help, students and workforce can preserve gaining knowledge of and coaching, although bodily apart. This calls for a funding in ICT and ICT infrastructures, potential building of students and team of workers, provision and affordability of ICT gadgets and facts.
2. The studies as shown in this paper additionally offer a professional reference base for online instructor education, which ends up in opportunities for a framework for boosting skills for trainer educators in accomplishing on-line coaching and the development of different standards to decorate excellent. This may be finished in collaboration with international and country wide ICT corporations for schooling and provision of infrastructure.
3. While there is a need for a national educational framework and attainment standards, sufficient community and parental sensitization, and appropriate teacher development, it may be practical Nigeria for federal and state governments to devolve issues of methodology and process to the lowest possible level, ideally the school or institution. Governments should examine this with key stakeholders.

4. Governments should prioritize the training of teachers in the use of technology and in conducting lessons online. Embarking on a programme of continuous educational improvement including the engagement and motivation of all learners through digital methods.

5. Contributing to a national review of the curriculum and development plans for reform. This is essential has it will pave way for a stronger learning process for the learners.