

THE IMPACT OF COVID-19 PANDEMIC ON MODES OF TEACHING AND LEARNING SCIENCE IN NIGERIAN SECONDARY SCHOOLS

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ABSTRACT

The Pandemic of COVID-19 has affected most of the education systems in the world and changed the way school conduct their daily activities. As a result, the learning activities changed to online mode of delivery. This study explores the Impact of COVID-19 Pandemic on modes of teaching and learning science in Nigerian schools. It is argued that conventional strategies of teaching are not adequate for teaching and learning science during the pandemic because of the lockdown and social distancing. The paper discussed the concept of science education in Nigeria, educational policies and practices before COVID-19 pandemic, concept of COVID-19 pandemic, the necessity of e-learning as the best alternative during the pandemic, the challenges as well as opportunities and implementation of e-learning in Nigeria. Hence, the study concludes that the present world pandemic is making the educational sector to look inward. Institutions at all levels are now embracing e-learning as an alternative to the face-face contact learning thereby helping the schools cover gaps the pandemic might caused the institutions academic calendar.

The study recommended among others that government should be proactive in ameliorating the challenges identified with e-learning in teaching science and build on opportunities e-learning offers educational institutions even in Post COVID-19 era.

Keywords: COVID-19, Science Education, e-learning, Pandemic, Social Distancing, Teaching & Learning.

Introduction

The World globally is faced with COVID-19 Pandemic which has held the economy at ransom not exempting the education sector. In March 2020, the Nigerian government ordered the emergency closure of all Primary, Secondary Higher Institutions of learning. This Pandemic has brought about recent changes and disruption in the Educational sector which serves as a catalyst for the development of any nation.

The Conventional mode of teaching fails and teaching and learning suffer a severe setback all over the world including

Nigeria. Teaching and Learning of Science Education is evolving. Many decades ago in Nigeria, the Conventional methods of teaching holds sway in the educational sector (Aina & Langenhoven, 2015). Educational sector globally seems to be shifting towards e-learning in order to cushion the effect of this pandemic. During COVID-19 School closure, teachers in Nigeria had to change their pedagogical approach from face-to-face to distance learning with little or no preparation.

Moving to distance learning requires specific professional development for teachers as this way of teaching raises many

challenges in designing and facilitating learning. Jeschofing & Jeschofing (2011), asserted that there is also a steep learning curve for teachers to familiarize themselves with the range of learning technologies available. Distance learning requires time-commitment compared to the face-to-face learning and interaction with the students several times per week.

In Nigeria, the lockdown in the country cause by COVID-19 Pandemic is severely impacting Science Education. The Pandemic has exposed the weakness in teaching and learning in Nigerian School because the typical teaching paradigm fails. However, developing countries like Nigeria is posed with the challenge of shifting from the traditional teaching method to e-learning during Pandemic. The challenges arise because of the varying degree of preparedness of the institutions, lack of infrastructures, paucity of funds and policies issue in Nigeria Education Sector.

Kennedy & Archanbault (2012), found that many teachers felt the strategies used in their face-to-face classroom did not make sense in the Online environment. As a result, teachers have to change their approaches to teaching and beliefs about teaching and learning. It means switching from giving knowledge to guiding knowledge, which provides the students what they needed as they needed it. This approach allows teachers to present the content in various ways, using text and multimedia and offered numerous chances for students to interact with the course content (Dipietro, 2010)

Regarding the current circumstances, Sintema (2020) has explained that Science, Technology, Engineering, Mathematics (STEM) subjects, which include Sciences, affected negatively in terms of learners performance in the National examinations. In Nigeria, it was noticed that there was a drop in students' performance in science subjects in the last external examination i.e. National Examination Council (NECO) and

West African Examination (WASSCE) held in 2020 due to the COVID-19 crisis, the researchers and educators around the world are trying to find possible alternatives that can work for students to have a paradigm shift from face-to-face mode of learning to on-line education. There is need therefore, to explore the impact of COVID-19 pandemic on modes of teaching science in Nigerian schools

Concept of Science Education In Nigeria

Science Education is a distinct form of creative human activity which involves distinct ways of seeing, exploring and understanding reality. Science, being a fundamental part of life and essential to our understanding of the world teaches us a way of finding out about the world and this help us to develop a growing body of ideals and work.

Science Education plays a vital role in the lives of individual on the development of a nation scientifically and technologically. Education is the total process of human learning by which knowledge is imparted, faculties trained and skill developed. (Urevbu, 2001). Education in Nigeria just like any other country is an instrument for achieving national development Country Educational policies are expected to change due to the review and modifications as the needs may arise from time to time. Many of the changes experienced in the education industry were occasioned by nation's commitment to the implementation of such international protocols as the Education For All (EFA), the Millennium Development Goals (MDGS) as well as Nigerian Home-grown Medium-Term Development Plan, the National Economic Empowerment and Development Strategy (NEEDS) etc.

All these strategic educational plans have always brought about new roles for the education industry because of its nature as an investment for economic, social and political development Education is seen as an aggregate tool for

empowering the poor and the sociality marginalized groups, it is also an effective means of developing the capacities and the potentials of human resources as well as the development of competent work force through the acquisition of practical life skills relevant to the world of work as a veritable means of developing sound intelligent learning societies fit and relevant to the 21st century. According to Ahmed Rufai (2013), every Nigerian child therefore deserves access to quality education which is relevant to the need of Nigerian economy

Educational Policies and Practices before COVID-19 Pandemic

Educational Policies are government's statement of intention, expectations, aspirations, standards and requirements for quality educational practices and delivery which are usually the offshoot of the assessment of the need of the society at any given time. All over the world, Nations set laws and policies guiding their educational system in such a way as to meet their economic and developmental needs. Through these laws and policies, stakeholders in education are guided in the delivery of education to the citizens of the nations.

In all settings, formal education takes place in the school system within the four walls of the classroom. Physical interaction between the teacher and the students, during classroom teaching and learning are the hallmarks of good lesson periods. It is essential in teaching process that the three domains of learning: affective, psychomotor and cognitive domains as identified by Bloom Engelhart, Frust, Hill & Krathroohl (1965) are effective. This can only be achieved through the various interactions that take place in the classroom. The use of physical materials as teaching aids, like concrete objects that students can touch and feel during lessons in the classroom, is an important aspect of lesson delivery and learning process. There are some of the

acceptable basic fundamental process in formal education throughout the world.

Generally, educational policies cover education in all tiers (early, childhood, nursery, primary, secondary and tertiary levels) of education.

However as good and laudable as these policies may sound, their success at achieving their set goals is largely dependent on the implementation and this is where the practice comes in. Practice is the reality of the workability of formulated policies. Challenges at the point of policy implementation may render a policy useless. That is what usually happens when policies are no more in tune with prevailing situations and circumstance. Hence, need to put in place a policy follow-up system that will be for policy review in this COVID-19 Pandemic era.

Covid – 19 Era and Nigeria Education System

The period witnessing the COVID – 19 has been described by many scholars as a traumatic era globally because all aspects of the economies have been affected by the Corona virus disease Ajetunmobi (2020) opined that the outbreak of the Corona virus disease (COVID-19) in 2019 is one of the major landmark in health challenges in human society and that its pandemic nature has affected many countries of the world either directly or indirectly through fear, anxiety etc.

In Nigeria, the COVID-19 ushered in a pathetic case of disequilibrium in the national education system. Schools were closed down for many months, some schools were able to find alternative means of teaching. The e-learning mode become an option for some schools while majority of the public schools had challenges of holding learning activities. Even, the rural areas without electricity suffered the most.

Many students, not having the required gadgets couldn't partake in the virtual teaching mode used by some schools;

this definitely will affect the academic growth of such learners. The impact of poverty was deeply felt by a lot of low income earners as they couldn't go out to make ends meet with multiple effects on the education of their children. Teachers who were not ICT friendly had challenges of keeping abreast of development in their schools on the issue of COVID-19.

The lockdown occasioned by the COVID-19 in Nigeria is severely impacting Science education. The effect of the pandemic is alarming in the educational system of the nation (Sahu, 2020). Social distancing, wearing of face mask and regular washing of hand with soap are some of the community mitigation measures that are recommended during the influenza pandemic (Ahmed, Malizia, Van Druenen & Marchal, 2020). Social distancing is a step taken to reduce physical contact with other individual (European Centre for Disease Prevention and Control, 2020). It is a measure taken during pandemic to restrict when and where people can gather to stop the spread of an infectious disease

COVID-19 Era has exposed lapses in the education system at all levels. This situation should be a major concern to educational stakeholders responsible for all programmes. Since school is one of the major fields to train citizen for the roles they have to take in developing their nation, then school programme should as a matter of fact consider the danger of ill – equipped graduates of schools at all levels and see the roles school can play in the development of adaptive and copying skills for every citizen.

E-learning in Science Teaching and its Challenges in the COVID-19 Pandemic Era

The e-learning is classified as Computer-based and Internet-based (Arkorful & Abaidoo, 2014). The type depends on the user mode. The Computer-based involves the use of ICT while the Internet-based is purely online. The

Computer-based include the use of computer hardware and software (Algahtani, 2011), the Internet-based comprises of e-mail, blog and other references (Almosa in Arkorful & Abaidoo, 2014). Thus, the e-learning could be classified as blended online learning.

The definition of blended learning varies according to individual perspective (Bryan & Volchenkova, 2016). The blended learning is rotation, self-blended and enriched virtual. Cleveland-Innes and Wilton (2018) categorized blended learning to three which are blended presentation and interaction, blended block and fully online. Some tools are peculiar to e-learning for effectiveness depending on the types. The benefits of e-learning are enormous; some of the advantages according to Pande, Wadhai and Thakare (2016) include flexibility, efficiency in knowledge and qualification enhancement, motivation of students' interaction, cost effective and others.

Despite the vital roles e-learning plays in Education, in many countries of the world, most developing nations including Nigeria are yet to unlock the full potential of it. The e-learning attempts to shift focus of the educational environment away from physical teacher-student context while disseminating information (Franklin & Nahan, 2018). In some parts of the globe, e-learning is not a new phenomenon in promoting education. Nigeria schools are using it to promote distance education and life-long learning (Reuter 2009).

Engagement in learning may increase when the student works alone rather than relying on a laboratory partner or sharing equipment center (Reuter 2009). Also distance learning allows students to work at their own paces. Teaching and learning in an e-learning environment happens differently than in the traditional classroom and can present new challenges to instructors and learners participating in the online learning environment.

The possible challenges instructors and learners face in an e-learning

environment must be considered in order to ensure learner's success. These include little or no preparation time by the teachers, steep learning curve for teachers to familiarize themselves with range of learning technologies available, availability of quality time when compared to face-to-face learning, interaction with the students several times per week (Jeschofnig & Jeschofnig, 2011), lack of infrastructures and policies issues.

On part of students, the challenges faced include adaptability, struggle, technical issues, computer literacy, time management and self-motivation. All these challenges need to be solved through proper initiatives for students' future benefits at any level of education. To overcome all these challenges, teachers should discover the need of their students, strengthen executive function skills and use differentiated instruction to help each student succeed.

Conclusion & Recommendation

It has been shown in this study that the COVID-19 Pandemic had an impact on teaching and learning of science in Nigeria. As a result, it seems essential to build and develop teachers' digital competencies in terms of creating hands-on activities and experiments, fostering interactions with students, managing students' behaviour, assess students' learning and time management. The beneficial features of e-learning are the ability for students to learn at

their own pace, obtain certificates of completion, and the simplicity of learning materials. E-learning propels students to spend time online and requires commitment of time and resources to complete the course.

The study among other recommends that-

- Government should be proactive in ameliorating the challenges identify in this study and build on the opportunities of e-learning offers educational institution, even Post COVID-19.
- Science teachers need to consider various aspects to create an interactive online environment.
- Training & workshops for science teachers on the usage of ICT in teaching science should be encouraged.
- Appropriate measure should be given to maintenance, provision of stable internet to support easy and fast learning and teaching science through e-learning.
- Students should be motivated in the use of e-learning for teaching and learning science.

REFERENCES

- Ahmed Rufai, R. (2013) "Foreword" *National Policy on Education. F.R.N, NERDC, Lagos.*
- Aina, J.K. & Langenhoven, K. (2015). The likely implications of active learning in Physics through peer instruction (PI) in Nigerian Schools. *International Journal of Law, Education. Social and Sports Studies (IJLESS) 2(3), 8-15.*
- Algahtani, A.F. (2011). Evaluating the effectiveness of the E-learning Experience in Some Universities in Saudi-Arabia from male students' perception. Durham theses, Durham University.
- Bryan, A. & Volchenkova, K.N. (2016). Blended learning: Definition Models, Implications for higher education. *Educational Sciences. 8 (2), 24-30 DOI:10, 14529/ped 160204.*
- Clevand-Innes, M. & Wilton, D. (2018). Guide to blended learning. Burnaby Commonwealth of Learning.
- Di Pietro, M. (2010). Virtual School Pedagogy: The Instruction practices of K-12 virtual school teachers. *Journal of Educational Computing Research, 42 (3), 327-254.*
- Franklin, U. E., & Nahari, A. A. (2018). The Impact of e-learning on Academic Performance: Preliminary examination of Kind Khalid University: *International Journal of Academic Research in Progressive Education and Development, 7(1), 83-96.*
- Jeschofnig, L. & Jeschofnig, P. (2011). Teaching Laboratory Science Courses Online: Resources for best practices, tools and technology, 1st edn. San Francisco John Wiley & Sons.
- Kennedy, K., & Archambault, L. (2012). Offering preservice teachers field experiences in K-12 online learning: a national survey of teach education programs. *Journal of teacher Education, 63 (3), 185-200.*
- Pande, D.; Wadhai, V.M. & Thakare, V.M. (2016). E-learning system and Higher Education: *International Journal of Computer Science and Mobilize Computing 5 (2) 274-280.*
- Reuter, R. (2009). Online versus in the classroom: student success in a hand-on lab class. *The American Journal of Distance Education 23 (3), 151-162.*
- Saliu, P. (2020). Closure of Universities due to Coronavirus diseases 2019 (COVID) – Impact on education and mental health of students and academic staff. *Cureus 12(4), 1-6.*
- Sintema, E. (2020). Effect of COVID-19 on the performance of Grade 12 Students: *Implications for STEM Education EURASIA Journal of Mathematics, Science and Technology Education, 16(7) 1-6.*
- Urevebu, A. O. (2011). Methodology of Science Teaching. Juland Education Publisher, Lagos.

COVID 19 PANDEMIC AND ONLINE