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Digitalization of Basic Education in Nigeria: Problems and Way Forward

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Abstract: This paper examined factors that is militating against digitalization of basic school education in Nigeria. Secondary data were used. The secondary data were gathered from print materials and online publications. The paper identified poor funding, shortage of digital facilities, power problem, poor internet connection, higher cost of digital facilities, poor digital skills and knowledge and shortage of digital experts, poor implementation problem, resistant to change and corruption as major problems that have militated against digitalization of basic education in Nigeria. The government should increase the funding of Basic education in Nigeria and more priorities should be given to the development of digital education. The government should provide adequate digital infrastructure facilities in all the Basic schools to aid accessibility and usability. Innovation Hubs/clusters should be set up in areas where they do not exist to make room for the laps that occurs in some areas in Nigeria, existing hubs should also partner with civil society groups to promote capacity building programs on digital education. The government should address the problem of power generation and distribution across the country. The government should invest more in the information communication technology to improve the connectivity level across the country etc.

Keywords: Basic education, Digital education, Technology.

Introduction

According to (Borisenkov, Gukalenko & Pustovoitov. 2021) digitalization in education is a variety of approaches for transitioning conventional modes of teaching and learning into the virtual world, such as online courses, online assessments, and web-seminars/conferences or workshops, among other things, using electronic platforms. (Daniel 2020) and (Ray 2020), digitalization involves electronic platforms which include, but are not limited to, Zoom, WhatsApp, Google Meets, Google Hangouts, Skype, Microsoft Teams, or FaceTime, where learning may be done synchronously or asynchronously online. (Bejinaru, 2019) viewed digitalization as the conversion of text, pictures, video, and music into digital format utilizing technologies such as a laptop computer, the internet, mobile devices, a scanner, a digital camera, a projector, and a printer, among others, that may be played by a computer.

(Machekhina 2017) defined digitalization as translation of all information kinds, such as text, audio, pictures, video, and other data from multiple sources into digital language. (Jagboro, Omotayo and Aboyade 2012) noted that digitization involves the process of making collections of historical and other

materials available online. (Pandey and Misra 2014) described digitization as the course of converting analog information to a digital format.

(Kannappanava; Rajamkanta and Tandur 2010) digitalization is the conversion of materials created in another format into an electronic form; this definition excludes materials that were initially created digitally, such as email communication. For (Witten and David 2003) digitalization is the process of taking traditional learning materials that are in book form and papers and converting them to the electronic form where they can be stored and manipulated by a computer.

The digitalization of education has brought fundamental changes to the entire educational sector. The benefits of digitalization in the education institutions have helped in the expansion in the accessibility of education services. (Ding, 2000) highlights the advantages of digitalization as follows:

1. Digitalization means no new buildings are required; improvement in information sharing and redundancy of collections reduced.

2. Digitalization leads to the development of internet in digitalized based institutions

3. Digital materials can be transmitted, sorted and retrieved easily and quickly.

4. It is cheaper to access electronic information than its print counterpart when storing files in an electronic device with compatible facilities and equipment.

5. Digital texts can be linked, made interactively; and improves the retrieval of more information.

Also, (Daily trust 2021) outlined the following as benefits of digital education;

Improved Accessibility and Access

One of the most inspiring digital transformation trends visible in education is the improved accessibility to school, lessons and even degree programs for students of all ages. Students who may have impairments that hinder their ability to access certain types of information will find out that technology can go a long way in removing these barriers. For example, text-to-speech programs and programs that transcribe dictated content can help to improve the ability of all students to access the information presented through schools. Those with visual or audio challenges, as well as reading disabilities, can all benefit from these different types of technology that allow them to learn and earn degrees.

Personalized Learning Approaches

Personalized learning approaches have also been an important component of the digital education revolution. Rather than trying to fit everyone into the same metaphorical box, many schools and programs have begun to realize the value of offering adaptable solutions for students based on their own strengths and weaknesses. It provides a number of benefits for students and learning institutions. When students are allowed to learn in a way that fits their own learning approaches best, it helps them absorb and retain critical information; personalization empowers them to move forward in their education. Learners become encouraged to earn the degrees and qualify for the educational and job opportunities that suit them well, but might have felt out of reach before.

Virtual Reality

Virtual reality has become an increasingly important component of technology across all sectors. Although it was initially used as a form of entertainment, it has also attracted attention for its potential in training sequences or even shopping. In the world of education, virtual reality can provide students with the chance to _experience' the material they learn before they actually move into real-world applications. For example, in the hospitality industry, students can see firsthand the different potential work environments, feel as though they are in a situation where they need to serve customers, and receive training that gives them hands-on experience without even leaving their classroom.

Cloud-Based Learning Opportunities

The cloud offers students and teachers the chance to connect from virtually anywhere. They can use these types of applications while sitting in a lecture hall in person, from home, or even half-way

around the world. When the pandemic hit, it only accelerated the potential for these types of applications. Teachers began using a variety of different platforms to host lectures and post videos for students to help them keep up with their education despite not being able to meet in person. These platforms offer a host of opportunities. They enable the streaming of lectures, thus making online classes possible and interactive. Students can also use many applications to submit their assignments, track their syllabi, and even connect and engage with others in their class. The platforms can be used to break out into smaller groups so that students can collaborate together on projects and assignments. Cloud-based applications that have been designed specifically for students can even allow students to take exams. Students from a wide range of backgrounds have more access to classes and educational opportunities. Learners who require degree programs that offer improved flexibility, students who do not live near a college or university that offers their desired program, or those who cannot attend class in person for any number of reasons will all experience benefits from the growth of cloud-based learning.

Teaching Digital Citizenship

As these digital transformation trends have impacted students in a variety of ways throughout their lives, students need to know how to interact politely and civilly online. This is similar to students learning how to be professional in an office or hospital setting. Schools have begun to recognize this importance, and teaching students in the principles of good digital citizenship has become an increasingly important trend throughout education. When educating students on being a good digital citizen, schools empower students to embrace the full capacity of technology. To see the best results from digital citizenship instruction, institutions should aim to make it part of the culture for the students and teachers alike. These principles guide people to behave more collaboratively online, which can help students succeed in their classes and in a professional environment.

Big Data

Schools have long collected a wealth of information about their students, including their demographics, grades and classes. Big data provides them with the opportunity to take this information much further and use it to better understand student trends and successes. Big data refers to the growing technological capabilities to track large amounts of data and interpret it with the assistance of algorithms to find patterns and helpful information. This includes the convergence of a variety of different sources of data. Schools may have previously gathered a wide range of useful information about students, but it was siloed and only really accessible to the particular person or department who collected the data. This made it harder to put the information in context and understand everything it could tell the school about the educational experiences they provide. Schools that learn how to break down these silos will find that they have a better chance of building a thorough understanding of their students and degree programs.

The digitalization programme in Nigeria includes all the forms of educational institutions from the basic to the tertiary education. Basic education is one of the educational programmes of the Nigerian government targeted at reducing the number of out of school children and to increase access to quality education. According to the (federal government of Nigeria national policy on education 2013) the goals of the basic education include; The goals of Basic Education are to: provide the child with diverse basic knowledge and skills for entrepreneurship, wealth generation and educational advancement; b. develop patriotic young people equipped to contribute to social development and in the performance of their civic responsibilities; c. inculcate values and raise morally upright individuals capable of independent thinking, and who appreciate the dignity of labour; d. inspire national consciousness and harmonious co-existence, irrespective of differences in endowment, religion, colour, ethnic and socio—economic background; and e. provide opportunities for the child to develop manipulative skills that will enable the child function effectively in the society within the limits of the child's capability. The policy went on and noted that human and material resources shall
be deployed to achieve the set goals. Such resources included technological and digital resources.

One of the strategies adopted by the Nigerian government to realize the objectives and goals of the

basic education is the digitalization programme of digitalizing all educational institutions in the country including the basic education. The federal government of Nigeria have developed and approved action plans that will ensure provision of a satellite-based education system for 4,360 users in the senatorial districts, including the installation of 109 receiver satellite unit modems, servers and antennas in three schools in each state. 4,360 android tablets and 109 solar units would be deployed to the Basic schools across the federation.

Despite formulation of different policies and programmes to ensure a free digitalization of educational institutions in Nigeria, it seems that there are many problems militating against digitalization of basic education in Nigeria. It is important to examine the problems. Based on this, this paper examines the problems militating against digitalization of basic education in Nigeria.

Problem Facing Basic Education Digitalization in Nigeria

There are many factors that have hampered the digitalization programme in the basic school education in Nigeria. Some of these problems include; poor funding, shortage of digital facilities, power problem, poor internet connection, higher cost of digital facilities, poor digital skills and knowledge and shortage of digital experts, poor implementation problem, resistant to change and corruption.

Poor Funding

The major issue in development of digital education is shortage of funds. One of the most serious problems threatening the digitalization of Basic schools in Nigeria is that of dwindling level of public funding in the face of rising demands and hence rising cost of Basic education. This shortage of funds affects installation of digital infrastructure facilities in schools. Basic institutions cannot realize its digitalization programme optimally without funding. This situation calls for increased fund initiative from both the government and educational stakeholders so as to sustain the digitalization policies and programme of Basic education in Nigeria. The inability of the Nigerian government to objectively accept and implement the 15% - 20% funding formula for education recommended by the UNESCO impact negatively on the digitalization of Basic schools in Nigeria. Digitalization programme is an expensive project that requires huge public investment from the federal, state and local governments. It is unfortunate that the allocation coming from each of the tiers of government for the administration of the schools are not adequate (Ogunode & Jegede 2020; Ogunode, Somadina, & Yahaya 2021). Funding for the purchase and maintenance of modern and state-of–the–art digital equipment by the government remains a major constraint (Asogwa, 2011).

Shortage of Digital Facilities

The lack of adequate digital resources and facilities to meet with the goals of basic education in Nigeria and the global challenges is a factor that has impeded on the digitalization programme of basic education in Nigeria. Digital resources such as e-learning platform is critical for schools to enable them integrate into the digital education system (Ogunode, Jegede & Musa, 2020). The absence of these digital resources in majorities of Basic schools in Nigeria has slow down the development of digital education in the basic schools across the country. Infrastructural facilities in most basic schools in Nigeria are in a state of disrepair. (Abubakar, 2018) observed that digital facilities are lacking in most basic schools and the few computer systems are being infected with a virus which makes them unfit for the digitalization project. The e-library is still not adequate to meet the needs of the growing population of the basic community (Ogunode & Dahir, 2021). There is a significant deficit of basic learning resources which including multimedia systems, magnetic boards, computers, printers, plotter etc. Electricity supply in basic schools is irregular and inadequate. The access roads to the most basic education schools are in bad shape. The water supply and reticulation in the schools have completely failed. (Ogunode & Stephene 2021) noted that Shortage of infrastructural facilities in the Nigerian Basic Education is also as a result of corruption in the administration of Basic Education in the country. Infrastructural facilities include; administrative block, classrooms, libraries, laboratories, ICT centre, tables, desks, black board, white board, water,

electricity, internet services and road network. Many Basic education schools in Nigeria do not have adequate infrastructure facilities to deploy for teaching and learning. Funds allocated for the provision of capital projects, replacement of facilities, repairs and maintenance in many primary schools in the Nigeria basic education ended up been diverted into private pockets.

Power Problem

Power supply problem in Nigeria has contributed to the slow pace of development in the digital education of basic schools in Nigeria. Energy problem is major challenge in Africa and especially in Nigeria. For instance, (Thisday, 2022) noted that West Africa has one of the lowest rates of electricity access in the world with only about 42% of the total population and 8% of rural residents, having access to electricity, yet only three countries are on track to provide access to electricity by 2030. ‒At this slow pace, 263 million people in the region will be left without electricity in ten years,‖ the World Bank said in its ‗Putting Africa on the path to universal electricity access' report. Also, Energy Progress Report released by Tracking SDG 7 in (2022) observed that Nigeria has the lowest access to electricity globally, with about 92 million persons lacking access to power which is stifling the country's industrial growth and causing other problems. The World Bank noted that tackling Africa's energy access crisis requires significant efforts, one of which is that West and Central African countries need to look beyond their borders and further integrate their national utilities and grids to other systems in the region. Many schools are not yet connected to electricity especially in developing countries, Nigeria inclusive. In such countries the government has not been able to connect all parts of the country to the national electrical grid. Consequently, those schools that fall under such areas are left handicapped and may not be able to offer computer studies (Mungai, 2011). According to Mohammed and Yarinchi (2013) Inadequate power supply is one of the major problems confronting teaching and learning process in Nigeria with particular reference to computer among others as it brings about digression, failure to achieve the desired goals and objectives in time. Electricity is essential for the operation of all ICT appliances without which they cannot function effectively (Osakwe, 2012).

Poor Internet Connection

Poor internet connection is common problem in Africa especially in Nigeria. The inability of the government to ensure a meaningful internet connection across the Nigeria have affected the digitalization of educational institutions. For instance, (Guardian 2022) reported that only 12.1 per cent of the Nigerian population currently enjoys Internet services (Meaningful Connectivity) quality in the country. This is according to an in-depth research by the Alliance for Affordable Internet (A4AI). A4AI, which explained that 81 per cent meaningful connectivity gap exists in Nigeria, claimed that only 6.6 per cent of the rural population and 16.4 per cent of the urban have good Internet service. This is coming as broadband penetration in Nigeria hits 42.3 percent, while users increased to 80.7 million. The Nigerian Communications Commission (NCC) statistics, which revealed this, also informed that Internet users via the narrow band also rose to 145.8 million within the same period. But A4AI explained that meaningful connectivity is a policy framework and Internet access metric to understand the quality of Internet access someone has. (Olatunde-Aiyedun, Ogunode,
& Eyiolorunse-Aiyedun 2021) and (Olatunde-Aiyedun, Eyiolorunse-Aiyedun, & Ogunode 2021) identified poor power supply as barriers to integration of educational institutions into e-learning programme.

Higher Cost of Digital Facilities

The high cost of digital facilities in Nigeria has contributed to poor development of digital education in the basic schools in Nigeria. Many teachers and students cannot afford to buy the digital resources to support teaching and learning programme in their respective schools. (Yinka, 2018) concluded that cost as one of the factors which influence the provision and use of digital services, indicating that the cost of digital facilities is too high for many to afford. (Abdull 2017) stated that monthly internet rates are exorbitant and the charges for satellite television are unaffordable for most Nigerians due to high rate of poverty. The high cost of digital facilities has made it difficult for Nigerian Schools to acquire

and install digital facilities for the use of teachers and students. High costs of infrastructures such as the Internet and power is one of the challenges faced in promoting digital education in Nigeria (Edsembli 2021; Ogunode, Lawal & Olubunmi, 2021).

Poor Digital Skills and Knowledge

Digital literacy presents many opportunities through several inter-connected areas and the beneficiary institutions and Nigerian students are already engaging with digital technologies and digital media and using them to carry out their learning programme. Globally, digital literacy has become indispensable for all students and teachers, whether to communicate in the school, carry out academic work, write exams with them and carry out research with the facilities. Digital literacy is compulsory for education stakeholders that want to contribute significantly to the development of education. It is unfortunate that many school administrators, teachers and students in the educational institutions especially in the basic schools are not digital literate and this has affected the development of digital education at that level of education. Recently, a World Bank Development report indicated that more than 50 percent of Nigeria's over 200 million population do not have digital skills and therefore cannot use data services, according to the 2021 (World Bank Development Report, 2021). The report further revealed that for Nigeria, despite having national data infrastructure compared to peers, there is still a huge gap in data usage, as critical demand side barriers persist. Chief economist at World Bank described the gap as a huge policy problem for Nigeria and the West African region. The report indicated that across Nigeria, the largest segment of the population is in the usage gap because they report a lack of digital literacy. More than half of the population is reporting that they don't have the skills to use data services, so this is a huge policy challenge, one of the largest for Nigeria and for the region. (Businessday, 2020). (Oyekanmi, 2016) observed that there is low ICT literacy in the educational institutions in Nigeria.

Shortage of Digital Experts

Digital professional in all nations constitute a major input in the accomplishment of digital educational goals and objectives, also trained and effective digital experts are the principal asset of any technological educational system. (Abu 2017) observes that IT constitute not only a vital input to education but also a major drive in the production process and in determination of the output system. ICT is relatively a very new development in Nigerian educational system and plays a vital role in teacher education to effectively surmount the enormous task of capacity and nation building. One of the greatest barriers to digital education in Nigerian basic schools is shortage of trained digital personnel, therefore staff need to be trained to become sufficiently competent to make personal use of digital facilities. (Olatunde-Aiyedun, & Ogunode, 2021) concluded that poor funding of education in Nigeria is responsible for shortage of professionals in the system.

Poor Implementation Problem

The poor implementation of education policies such as the digital literacy policy in the Nigerian schools have also affected the development of digital education in the basic schools across the country. The Nigerian government through its agencies such as National Information Technology Development Agency (NITDA), Federal Ministry of Science & Technology and federal ministry of education have set a target of achieving 95 percent literacy level in the country by 2030 and the Ministry of education as well as the Ministry of Communication and Digital Economy have a target to achieve 60 percent digital literacy for youths and adults by 2025 (NITDA, 2021). The poor implementation of these policies in the schools have limited the digitalization programme in the basic schools. (Punch 2021) reports that stakeholders identified that Nigeria has made several signs of progress in the development of the education system, however, policies, innovations, and practices seem disconnected or disjointed. Nigeria has one of the most robust education policies, but a major challenge is the implementation of the policies. Federal agencies such as the NUC, the NCCE, National Board for Technical Education, and TET-Fund are responsible for formulating, funding, monitoring and implementations of higher education teaching and research policies. (Ola 2020) also noted that the key challenges of basic education are attributed to the funding problems and non-

implementation of policies. The non-implementation of policies has an impact on the standard of education and has impeded development of education in Nigeria.

Resistance to Change

There is a resistance to change by both school administrators, teachers and students from traditional pedagogical methods to more innovative, digital-based teaching and learning methods. There is problem with digital education because of the attitude of the teachers and students. Resistance to Change is a major problem in the advancement of digital education in basic schools in Nigeria. The general attitude of people towards change and what digital literacy offers, is a hindrance in promoting digital literacy. Many teachers in basic school in Nigeria lack the basic digital training, not to mention specialized training required for digitalization. Also, digitalization is a complex process which requires specialized skills. However, a good number of teachers who may be involved in the digitalization process in Basic schools may not be skilled as they do not possess adequate knowledge or competence in the handling of digitalization equipment (Ogunode, Dahir, Yahaya & Jegede, 2021).

Corruption

Corruption in the administration of Basic education in Nigeria has affected the digitalization programme of basic schools. Funds meant for the capital and recurrent services in the Basic schools are been diverted by the officials of the ministries. Funds budgeted for development of digital education and programme are been diverted into private banks. Many public funds meant for the infrastructure facilities development in schools in Nigeria are diverted and mismanaged. (Osunyikanmi 2018) noted that Nigeria has been experiencing underwhelming development amidst overwhelming corruption. Education is not insulated from this malaise. Corruption allows a high percentage of the funds allocated to the sector to get diverted into the private accounts of public officials. According to (Ogbonnaya 2010), some heads of educational institutions receive 10% gratification for the execution of any project in their institution. (Ogunode & Stephene 2021) concluded that shortage of funds, inadequate teachers, shortage of infrastructural facilities, poor quality of education, large out of school children, poor capacity development, poor implementation of Basic education policies and increase in the cost of Basic education administration are the effects of corruption on Basic education administration in Nigeria.

Conclusion Recommendations

This paper examined factors that have hampered the digitalization programme in the basic school education in Nigeria. The paper concluded that poor funding, shortage of digital facilities, power problem, poor internet connection, higher cost of digital facilities, poor digital skills and knowledge and shortage of digital experts, poor implementation problem, resistance to change and corruption are the major problems that have militated against digitalization of basic education in Nigeria. Based on these problems identified, the paper recommended the following:

1. The government should increase the funding of Basic education in Nigeria and more priorities should be given to the development of digital education;

2. The government should provide adequate digital infrastructure facilities in all the Basic schools to aid accessibility and usability. Innovation Hubs/clusters should be set up in areas where they do not exist to make room for the laps that occur in some areas in Nigeria, existing hubs should also partner with civil society groups to promote capacity building programs on digital education.

3. The government should address the problem of power generation and distribution across the country.

4. The government should invest more in the information communication technology to improve the connectivity level across the country.

5. The government should subsidize the price of digital facilities for teachers and students. Government should provide tax incentives/ reliefs for telecoms to enable them to reduce the costs

of data. Telecoms can also provide tech parks using intranet with available resource materials to allow for access to the internet.

6. The government should organize training for teachers and school administrators on digital skills.

7. The governments should employ more digital experts and post them to schools.

8. The government should implement all policies in regard of digital education in all level of education especially the basic school education in Nigeria;

9. In order to ward off resistance to change, there should be more orientation programs on the need and importance of digital literacy using the bottom-top approach of reaching out to grass root individuals.

10. The government should deploy all anti-corruption agencies in the country to monitor the funds released to all the basic schools across the federation.

References

1. Abdull, J.K. (2017). Deployment of information communication technology (ICT) for teaching and learning in Basic schools in Bauchi State, Nigeria. *Journal Technology 7*(3), 50–55.

2. Agyeman, O.T. (2007). ICT for education in Nigeria. Survey of ICT and education in Africa. Nigeria country report: world fact book.

3. Akinyemi1, I. A., Amaechi, L. I., Etoh, L. C. (2022) ‖Digitalization of education in Nigerian secondary schools: benefits and challenges. *Journal of Education & Humanities Research* (JEHR) *Institute of Education &Research (IER), University of Balochistan,Quetta- Pakistan. 13, (I), 34-44*

4. Businessday (2021) Over 50% of Nigeria population lack digital skills. https://businessday.ng/technology/article/over-50-of-nigerias-population-lack-digital- skills-world-bank/

5. Daily trust (2021) Digital learning and Nigerians education sector. https://dailytrust.com/digital-learning-and-nigerias-education-sector/

6. Ding, C.M. (2000). Acess to digital information: some breakthrough and obstacles. *Journal of Librarianship and Information Science 32(1)*

7. Fabunmi, B. A., Paris, M. and Fabunmi, M. (2009). Digitization of library resources: challenges and implications for policy and planning. *International Journal of Africa and African American studies 5(2): 24-36*

8. Federal Republic of Nigeria (2013). National Policy on Education. 6th ed. Lagos: Nigerian Educational Research and Development Council.

9. Guardian (2022) 81 % of Nigerians lack meaningful internet connectivity' https://guardian.ng/business-services/81-of-nigerians-lack-meaningful-internet- connectivity/

10. Daniel, J. (2020). Education and the COVID- 19 pandemic. *Prospects, 49*(1), 91-96.

11. Edsembli (2021). Digital learning: 7 key challenges and their solutions. *https://www.edsembli.com/digital-learning-4-key-challenges-and-their-solutions*

12. NITDA (2021) National Digital Literacy Framework (NDLF), Draft Document, Version 1.0, December 2021, Pg21.

13. Ogbonnaya, N.O. (2010). Principles and applications of educational policies in Nigeria. Nsukka: University Trust Publishers.

14. Ogunode, N. J. & Jegede, D. (2020). Challenges of using ICT for administration of secondary schools in Nigeria and the ways forward. Unpublished Article

15. Ogunode, N. J., Somadina, O. I. & Yahaya, D. M. (2021). Inadequacy of Information Communication Technology (S) in Public Universities in Nigeria: Causes, Effects and Way Forward, *Middle European Scientific Bulletin* (17), 344-354

16. Ogunode, N. J., Attah, G. E. & Ebute, J. (2023). Investment in education in Nigeria: barriers and way forward. *European Journal of Higher Education and Academic Advancement* 1 (2), 61-71

17. Ogunode, N. J. & Dahir, N. (2021). Challenges preventing public primary school students from using Information Communication Technology for learning in Nigeria and the way forward. *Electronic Research Journal of Social Sciences and Humanities* 3(3),45-55

18. Ogunode, N. J., Jegede, D. & Musa, A. (2020). Administration of Information Communication Technology (ICT) in Nigerian secondary schools: Challenges and the ways forward. *Electronic Research Journal of Engineering, Computer and Applied Sciences* 2(2020),50-63.

19. Ogunode, N. J., Nasir Dahir, N., Yahaya, D. M. & Jegede, D. (2021). ICT usage for primary school administration in Nigeria: challenges and way forward. *International Journal on Human Computing Studies* 3(7), 1-9

20. Ogunode N. J., Lawal, M. M. & Olubunmi, A. (2021). Inadequacy of Information Communication Technology(S) in Nigerian public primary schools. *Central Asian Journal of Social Sciences and History* 2(12), 104-112

21. Ogunode, N. J., Akinyode, F. & Ayoko, V. O. (2023). Education policy instability in Nigeria and implications for educational development in Nigeria. *Web Synergy: International Interdisciplinary Research Journal, 2(1), 1-12* 3

22. Ola, T. Y. (2020). Information Communication Technology (ICT) in Nigerian schools: problems and the solutions. *Electronic Research Journal of Engineering, Computer and Applied Sciences www.erjsciences.info* Volume 3 (2020), 31-40

23. Olatunde-Aiyedun, T.G., Ogunode, N.J. & Eyiolorunse-Aiyedun, C.T. (2021). Assessment of virtual learning during covid-19 lockdown in Nigerian public universities. Academicia Globe: Inderscience Research, 2 (5) 159- 175. https://agir.academiascience.org/index.php/agir/article/view/132 or https://doi.org/10.17605/OSF.IO/S6N2Q

24. Olatunde-Aiyedun, T.G., Eyiolorunse-Aiyedun, C.T. & Ogunode, N.J. (2021). Post covid-19 and digitalization of university lecturers in Nigeria. *Middle European Scientific Bulletin*, 11(1). http://cejsr.academicjournal.io/index.php/journal/article/view/488

25. Olatunde-Aiyedun, T.G. & Ogunode, N.J. (2021). Shortage of professional science and environmental education teachers in Nigeria. *Asian Journal of Science Education*, 3 (1),111. https://www.researchgate.net/publication/350819014 Shortage_of_Professional_Science_and_Environ mental_Education_Teachers_in_Nigeria

26. Olatunde-Aiyedun, T.G. & Ogunode, N.J. (2021). School administration and effective teaching methods in science education in Nigeria. *International Journal on Integrated Education,* 4 (2), 145- 161. 10.13140/RG.2.2.11502.54080

27. Oyekanmi, A. (2016). Information and Communication Technology (ICT) needs and competence level of basic technology teachers in Kwara state. Retrieved July, 18, 2019 from https://www.coursehero.com/file/39570341/journalism-and-communication information-and-communication-technologydocx/

28. Osunyikanmi, A. F. (2018). Prioritizing quality education in Nigeria: a commitment to sustainable development goals. *International Journal of Advanced Studies in Economics and Public Sector Management | IJASEPSM*. 6 (2), 10

29. Onyia, M. N. (2020). Digitalization of education in Nigeria: A path to technological advancement. https://www.thisdaylive.com/index.php/2019/09/15/digitisation-in Nigerian-Education/

30. Punch (2021). An impact assessment of higher education in Nigeria. https://punchng.com/an-impact-assessment-of-higher-education-in-nigeria/

31. Ray, K. (2020). What is remote learning? *https://www.techlearning.com/how-to/what-is-remote-learning.*

32. Yinka, Y. O. (2018). ICT education programmes in Ondo State, Nigeria. *Journal of modern technology, 4*(1), 81-94.