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Effective implementation of Information communication technology (ICT) policy as a panacea for efficient and sustainable educational development in Nigeria amidst covid-19 Pandemic.

By

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Abstract

Across the world, Information and Communication Technology (ICT) has become an indispensable tool for socio-economic, political and educational transformation and sustainable development. The Nigerian educational system has since recognised this fact and thus introduced ICT policy to promote its educational development. Despite its adoption and clearly stated objectives and strategies that are focused on education, the document appears inadequate to cater for the needs of the country's education system, especially in critical situations. This paper was therefore designed to critically analyze the Nigerian ICT policy to ascertain its efficacy during the Covid-19 pandemic. The study adopted an exploratory qualitative design using literature review approach to generate data needed to answer the research questions. Data was gathered through secondary sources, specifically, via document analysis and meta-synthesis of literature, which included several peer-reviewed journals, reports and books, in order to provide answers to the research objectives. Results on objective one, which sought to know the various ICT platforms used during the pandemic, showed that some institutions employed e-learning facilities such as radio, television, Google Classroom, WhatsApp, Zoom, Telegram, Facebook, google, twitter, Instagram, Mobile Classroom App, School Gate, and e-learning portals to ensure learning during the lockdown. However, the learning was not comprehensive, all inclusive and synchronous to guarantee effective and efficient learning as stated in the policy. Answers on objective two, revealed that the platforms were not effectively and synchronously executed, not comprehensive and expanded to accommodate all the students who were scattered across the country. Further results on objective three, identified lack of access to ICT infrastructure, lack/ poor internet access and data, lack of digital competence, lack or unstable power supply and problem of funding as some of the major challenges that impeded the effective implementation of the policy during the pandemic area. Although the study has some significance in the area of encouraging reappraisal of the policy to accommodate future challenges so that a comprehensive, efficient, sustainable and synchronous education can be achieved for all Nigerians, this can only be achieved when more efforts are imputed. It is therefore recommended that, more infrastructures to support the policy be provided and policy redesign be done to accommodate similar occurrences, so as to make the ICT policy responsive and effective in advancing educational development in the country.

Key words:
Information and Communication Technology (ICT), Sustainable Educational Development, Covid-19 pandemic

CONTENTS

1.0 Introduction

Across the world, Information and Communication Technology (ICT) has become an indispensable tool for socio-economic, political and educational transformation and sustainable development (Gillpatrick, 2020). The significance of ICT has become even more imperative in the 21st century where there have been escalating socio-economic, security and health crises leading to disruptions and alterations in economic, social relationships and educational interactions. In education particularly, global exigencies have made usage of ICT the most reliable tool for generating , transferring and utilizing knowledge and skills among nations ((Ifijeh, Iwu-James and Adebayo, 2016). This has undoubtedly helped in reshaping and sustaining quality education at all times and levels, leading to significant development in the education sector.

The concept of Information Communication Technology can be defined as electronic means of capturing, processing, storing and disseminating information. Ogochukwu and Osuagwu (2008) defined Information and Communication Technology (ICT) as processing and maintenance of information, and the use of all forms of computer, communication network and mobile technologies to mediate information. It comprise all forms of information, network and computer technologies employed in transmitting audio, video, data or multimedia messages such as cable, satellite, fibre optics, wireless (radio, infra-red, wifi, personal area networks (PAN), campus area network (CAN), intranets, extranets, LANs, WANs, MANs, and the internet. The Nigerian National Policy on Information Communication Technology (2019) defined ICT as the art and applied sciences that deal with data and information. It encompasses all (equipment including computational machinery - computers, hardware, software, firmware, tools, methods, practices, processes, procedures, concepts, principles and the sciences) that come into play in the conduct of the information activities: acquisition, representation, processing, presentation, security, interchange, transfer, management, organization, storage and retrieval of data and information. From the definitions, it becomes obvious that ICT has a

great penetrating influence in education, through facilitation, generation, storage, management, transfer and use of educational knowledge and therefore, has great impact on its effectiveness and sustainability.

Previous literature indicates that adoption of Information and Computer Technology (ICT) in education has made education more robust, effective and efficient. In Nigeria for instance, use of ICT has greatly improved students' knowledge, comprehension, practical skills, presentation skills and innovative capabilities to a great extent (Ifijeh et al., 2016). It has also proved to optimize teacher's delivery of information and adds value to the processes of learning and the organization and management of learning institutions. Most importantly, it is helping nations to enhance the educational system beyond classrooms and reaching out to all sects of society in common fashion. Thus, according to Ifijeh et al., (2016) sustainability and effectiveness of education in the 21st century can only be achieved with the effective and efficient deployment of ICT to access, process, share, and exchange, utilise or transmit knowledge or quality. This has awakened many nations to the consciousness of applying technology in education, as a result of which many policies and programmes aimed at digitising learning are being introduced.

The Nigerian government has since keyed into the idea of integrating technology in education. In recognition of the relevance of technology to educational progress, the federal government (through the Federal Ministry of Education) introduced the Information Communication Policy in Education, first in 2013, with the latest edition being in 2019.

The vision of this policy is to make an education that is universally accessible, empowering,

enriching and inclusive for all Nigerians. The policy aims to provide holistic and efficient education to Nigerian students through technological application, while also providing necessary teacher training and other technological support to advance education in the country. To achieve this, several objectives were formulated, which included using ICT to: facilitate the teaching and learning process; promote life-long learning and advance knowledge, foster

research and development; enhance universal access to information at all times; widen access to education and the range of instructional options and opportunities for any-where, any-time, any-pace and any-path learning and finally, develop and support technical infrastructure that maximizes digital creativity, sharing and innovation.

In order to achieve the objectives for human resources development and utilization of ICT in education, several strategies are outlined. These strategies are targeted at the building of knowledge and skills in information technology to accelerate educational development at all times and include: deployment of ICT to drive education in the country; provision of requisite ICT infrastructure such as campus network, internet connectivity, computers amongst others; development of ICT curriculum for primary, secondary, and tertiary institutions; use of ICT to streamline education delivery management; building and encouraging the development, utilization and sustenance of the ICT manpower required to achieve an ICT-enhanced education; developing and strengthening standards and guidelines for content and instructional materials in electronic media and the use of ICT tools in formal and non-formal Education; strengthening and expanding Open and Distance Learning as well as blended and e-learning; ensuring the provision of a common ICT infrastructure for education at all levels to support effective teaching, learning, administration and research.

In spite of these objectives and strategies that are focused on education, the document appears inadequate to cater for the needs of the country's education system, especially in providing critical response to emergency situations. Historically, the development of ICT is at the infant stage in many developing nations (UNDESA, 2018). Within the sub-Saharan context, for example, Ferri et al. (2020) highlight poor internet connectivity, poor infrastructural facilities, lack of operational capabilities and low teacher quality as some of the barriers that have limited the applicability and integration of ICT into key human capital development processes, such as learning and teaching within school environments. In Nigeria,

with the increasing adoption of digital learning interventions, there is still limited evidence of their effectiveness.

The Covid-19 pandemic which struck many nations across the globe further exposed the inability of the policy to effectively accommodate some of the peculiarities that hinder technological application, and thus impede the efficiency of ICT policy in achieving its objectives. At the onset of the COVID19 pandemic, and as a response to massive school closures globally, the continuity of teaching and learning within formal educational systems became significantly dependent on the ability to engage in online learning activities or an access to educational materials digitally (Dhawan, 2020). The emergent trend in electronic teaching and learning presents new opportunities as well as grave implications. As traditional classroom teaching transitions to online learning delivery, bridging existing digital gaps between students and teachers and those who are not connected became imminent and pertinent (Dayagbil et al., 2021; UNESCO, 2020). In Nigeria, over 39,440,016 learners in elementary and secondary schools and makeshift learning centres in internally displaced persons (IDP) camps could not access learning opportunities in mainstream settings. The immediate urgency to close schools to contain the spread of COVID19 did not match up with the expected pro-active mobilisation of support for educational access through digital means.

Although school closures at first led to a perceived proliferation of online learning, it is arguable that the efforts made by the federal and state governments across Nigeria to ensure that learning continues for every child did not fulfil the set objectives (Adegoke et al., 2020). According to The Education Partnership (TEP) centre in a 2020 study on learning during the pandemic, of the estimated 34 million Nigerian students missing out on learning opportunities during the COVID19 pandemic, about 70% do not have access to essential digital devices. Additionally, not all teachers have the technical capacity to facilitate e-learning with competence

varying across rural and urban locations. The requisite technological gadgets and logistics such as internet facilities, electricity and many others were either epileptic or inadequate to support

the visual learning in many areas. All these cast great doubt on the ICT policy and its ability to effectively impact education in the covid-19 era.

From the foregoing, it is evident that the Nigerian ICT policy is still at its nascent stage. The implication is that due to lack of preparation, any educational system that is without the necessary technological infrastructure in place will have to shut down at the commencement of the lockdown necessitated by the COVID-19 pandemic (Ifijeh et al., 2016).This feature is common in the African continent (Nigeria inclusive) as challenges such as infrastructure, broadband as well as data cost among others has affected some educational institutions. Furthermore, one of the aims of The Global Education 2030 Agenda of UNESCO (2020a) is quality education which aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Therefore, it is imperative to pay more attention to the digitalisation of teaching and learning in Nigerian educational institutions. However, to the best of my knowledge, there is still paucity of research that specifically looks at the level of implementation and effectiveness of the ICT policy in promoting sustainable education during the pandemic. It is now important to examine the document as it affects education during covid-19 period.

Consequently, this literature study explores the digitalisation of teaching and learning in Nigeria amid COVID-19 pandemic. It particularly examines the ICT policy in education vis-à-vis its level of implementation during the covid-19 period, to establish how efficacious or otherwise it worked in promoting comprehensive and sustainable education. The objectives of the study are therefore to; (1) identify what ICT policies were adopted to ensure effective teaching and learning at all levels of education during the covid-19 lockdown in Nigeria; (2), how adequate was the policy in integrating ICT in Nigerian educational system to provide comprehensive and all inclusive education during the lockdown; (3), what challenges hindered effective implementation of the policy; (4), what agenda is needed to redefine the national policy to cater for the country's education system, especially in times of national emergencies.

1.1 Significance of the study

This study is significant in that it will awaken the government and other relevant stakeholders on the importance of having ICT fully implemented in our schools. This is necessary to prepare for and manage similar future occurrences without having our educational calendar altered or putting our children out of school. Similarly, the study will advance the relevance of ICT in promoting and providing comprehensive, efficient, sustainable and synchronous education to all Nigerians at all times to meet the Millennium Development Goals in education and ICT policy objectives. The study will also provide opportunities for evaluation, redesign and appraisal of Nigerian ICT policy in education to identify areas that need adjustments or modification, so that its benefits can be fully achieved.

1.2 Theoretical Anchorage

1.2.1 Social theories

Social theories are a group of theories developed by a set of authors but key among them are Mackensie and Wajcman (1985). They include structuration theory, Activity theory, Actor-network theory, Social presence theory, Systems theory etcetera. Social theories focus on how humans and technology affect each other. They argue that technology does not determine human action, but that human action shapes technology. Some of these theories focus on how decisions are made with humans and technology: humans and technology are equal in the decision, humans drive technology and vice versa. The interactions used in the majority of the theories look at individual human interactions with technology. The theories described are purposefully vague and ambiguous, since the circumstances for the theories change as human culture and technology innovations changes. Among the Social theories, this work will focus on the Systems theory.

1.2.2 Systems Theory

This theory was developed by Hughes and Luhmann (2008), this theory is mainly concerned with the historical development of technology and media with an emphasis on the relationship and connections between the equipment and machines being built and the social,

economic, political and cultural factors surrounding it, which is controlled by humans. It sees an interconnection between machines and the activities of humans, stating that results can be gotten in any area if structures, systems and plans are properly coordinated by human activities.

With regards to this topic, the theory shows that effective interface between human and technology will improve teaching and learning even in emergency situations that inhibits social or physical approach to learning.

Therefore, effective implementation of ICT will lead to sustainable development of the education sector amidst the covid-19 pandemic if all the plans and policies outlined are properly executed and enforced by the systems put in place, so, there needs to be a functional working relationship with systems and structures.

2.0 Literature Review

The main purpose of integrating diverse technologies into the teaching and learning process is to create more room for comprehensive and all inclusive remote learning, and this is one of the key areas of the Nigerian ICT policy in education. According to Suvin (2020), one of the cornerstones of Nigerian ICT policy in education is to provide students with the opportunity to learn anywhere, anytime with diverse online technology tools that promote remote and self-paced learning. The outbreak of Covid-19 pandemic brought about massive school closure across the world. In China for example, Huili (2020) observes that as a result of the new coronavirus epidemic most universities in China have encouraged their professors to apply online teaching instead of in-class teaching. Similar procedures have been carried out in the US, UK and Australia and Africa, where the face-to-face approach of learning was suspended and learning through technology became the order of the day. This literature review will therefore focus on: the overall of Covid-19 in Nigeria, the digitalization of teaching and learning and various ICT facilities that were used ((based on ICT policy in education) to ensure continuity and effective teaching and learning during the lockdown, the adequate and the

extent of ICT policies implemented during the lockdown to promote effective learning and the challenges that affected these policies.

3.0 COVID-19 Pandemic in Nigeria

The Covid-19 pandemic which struck the world in the last quarter of 2019, officially registered its presence in Nigeria on February 27, 2020, according to the Nigeria Centre for Disease Control [NCDC] (2020). The first positive case was linked to an Italian who arrived in Nigeria through the Lagos Airport. Nigeria was characterised by WHO as one of the 13 high risk African countries with respect to the spread of COVID-19. In a bid to curtail the further spread of the virus, a travel ban was placed on returnees from the 13 high risk countries through border closure announced by the Presidential Task Force (PTF) for COVID-19 on the 9th of March 2020 (Agusi et al, 2020; Amzat et al, 2020). However, exactly one month after the first case, that is 27th March 2020, the virus has spread to 10 States in Nigeria, bringing it to a total of 81 infected persons (Amzat et al, 2020). Consequently, one of Federal government's measure to limit the spread of the virus, was to close all schools in Nigeria, including tertiary, secondary and primary schools on the 27th of March 2020 (Eze et al, 2021;Ogunode 2020a; Jegede, 2020; Ogunode, Abigeal and Lydia, 2020). This affected 39,440,016 primary and secondary school learners across Nigeria, including those in internally displaced camps (Oyediran, 2020; Owoyale-Abdul Ganiy and Jibril, 2021). Therefore, the Federal and State governments as well as those within the private sector, in response to the education emergency instituted measures to cushion the impact of schools' closures by implementing diverse learning interventions through remote learning using technological platforms, internet-based tools and traditional media in the Nigerian educational system (Azubuike et al, 2021).

3.1 Digitization of Teaching and Learning and the use of ICT Facilities during the Lockdown

The use of digital technology has become a key component of teaching and learning in

the 21st century (Gillpatrick, 2020). In the educational parlance, digitalization connotes the translation of text, images, video and audio into digital format using such tools as the laptop computer, internet, mobile devices, scanner, digital camera, projector and printer among others that can be played by the computer (Bejinaru, 2019). It also refers to the various models of transition of traditional forms of teaching and learning into the virtual environment, that is online courses, online examinations and web-seminars among others through the aid of electronic platforms (Borisenkov, Gukalenko and Pustovoitov. 2021). These electronic platforms according to Daniel (2020) and Ray (2020) include, but not limited to FaceTime, Google Hangouts, Skype, Microsoft Teams, Zoom, or WhatsApp, where learning is executed online either synchronously or asynchronously.

Generally, *Barak (2017)* from his study found how teachers integrate web-based technologies to facilitate individual and collaborative, synchronous and asynchronous active learning, in class and outdoors. During the period of lockdown, learning through digital technology became very imperative. Many universities and colleges adopted different ICT infrastructural facilities to ensure teaching and learning. Oke and Fernandes (2020), reported that social media platforms such as Facebook and Instagram, WhatsApp were used by different institutions. In addition, there was deployment of manpower where teachers, lecturers were usually meant to interact with students using technological facilities like Zoom to promote visual teaching and learning (Olatunde-Aiyedun, Eyiolorunse-Aiyedun and Ogunode, 2021).

3.2 Implementation of ICT policies during the Covid-19 Lockdown in Nigeria

In order to ensure learning continues even in the phase of covid-19 and school closure, the ICT policy was activated. One of the focal areas of the policy is to provide a comprehensive

and all inclusive teaching and learning to Nigerian students at all levels through technological application. There is no doubt, the outbreak of COVID-19 catalysed the integration of these technologies in education in the country. With the lockdown procedures in place, teachers were

compelled to adopt the visual teaching approach (Olatunde-Aiyedun, et al., 2021). Various online learning methods were adopted, especially at the university level to ensure continuous learning. However, literature reports by Adeleke (2021) indicates that about 46% of its estimated population of 206.1 million people still lack access to internet connectivity (Adeleke, 2021).

According to Olatunde-Aiyedun et al., (2021) some professors and students have complained about problems with online teaching and lack confidence in its effectiveness, due to technical hitches and poor technological knowledge.

Furthermore, the policy emphasises the need for continuous training and capacity building of manpower to acquit them with the necessary ICT knowledge and skills needed for effective teaching and learning. However, previous literature have shown that in spite of the policy statement, there is still lack of adequate ICT knowledge among many staff, and this has led to a serious set back to our educational system in Nigeria (Ojelade, Aregbesola, Ekele and Aiyedun, 2020).Computer education introduced into the Nigerian secondary school since 1988 has largely been unsuccessful as a result of teachers' incompetence (Yusuf, 1998). Empirical studies have established that teachers' ability and willingness to use ICT and integrate it into their teaching is largely dependent on the professional development they receive (Davis, 2003; Pearson, 2003; Selinger and Austin, 2003). The Nigerian national ICT policy is silent or has not done enough on teacher education and teachers' ICT professional development as envisaged by the review of Culp, et al. (2003).

In addition, to the policy objective to widen access to education and increase opportunities for any-where, any-time, any-pace and any-path learning, the level of implementation during the covid-19 appears inadequate. Although the potential for ICT to provide innovative learning approaches such as virtual learning is already being widely explored in both traditional and non-traditional educational settings, this was evidently not synchronously implemented during the pandemic. Due to disparities in technology access between urban and rural areas, the countries struggle to leverage emerging advancements in

Information Technology (IT) for greater economic and social benefits, and increased global competitiveness (Ohemeng and Ofosu-Adarkwa, 2014). The situation was not different in Nigeria during the lockdown where there were reported discrepancies in technology, such as internet connectivity speed, digital facilities and technological knowledge available between urban and remote areas. The immediate urgency to close schools to contain the spread of COVID19 did not match up with the expected pro-active mobilisation of support for educational access through digital means.

Although school closures at first led to a perceived proliferation of online learning, it is arguable that the ability of the education policy to ensure that learning continues for every child in every location did not fulfil the set objectives (Adegoke et al., 2020). This suggests that the policy did not envisage challenges such as lockdown that could necessitate a comprehensive and synchronised learning in times of health emergencies.

The ICT policy also aims to develop and support technical infrastructure that maximizes digital creativity, sharing and innovation. During the covid-19 lockdown and subsequent schools closure, the government, through relevant agencies, made efforts to provide technical support that increased information sharing between staff and students. However, inadequate provision for audio-visual learning aids such as: projectors, computer, screen and power supply/generators to facilitate this learning further exposed the ineffectiveness of the policy in addressing emergency situations (Ojelade, Aregbesola, Ekele and Aiyedun, 2020).

3.3 Challenges to Implementation of ICT policy in Education

There is a plethora of research pointing to numerous challenges that affected the implementation of ICT education policy. One of the key challenges has to do with unstable internet service. At the university level for instance, unstable internet services have been identified as a major challenge (Ogunode, 2021). ICT services are not well planned to cover all parts of Nigeria. The network services are so weak that connecting to the internet is a problem. The inability of network providers to cover many parts of the country frustrated many schools

from switching into the online platform during the COVID-19. This challenge also affected learning to be done synchronously thereby bringing about a disparity amongst learning content and speed.

Unstable electricity has long been acknowledged as an obstacle to the integration of ICT tools in teaching (Adavbiele 2016). The policy did not adequately provide a solution on how to tackle epileptic power issues and this further exposed its defectiveness during the covid-19 pandemic as most schools and students could not effectively utilize the limited available ICT facilities for teaching, researching and carrying out other academic works. Therefore, despite the objectives of the policy in promoting education that is universally accessible, enriching and all inclusive to Nigerian students at all times, it appears that little work has examined the policy to ascertain its capacity to promote sustainable education during the covid-19 era.

4.0 METHODOLOGY

The study shall adopt an exploratory qualitative design using literature review approach to generate data needed to answer the research questions. Data for the study will be gathered through secondary sources, specifically, via document analysis and meta-synthesis of literature which shall include several peer-reviewed journals, reports and books. Sources qualified for inclusion as data in this study are recently published journals, policy and reports from national and international organisations on the following themes namely, Information Communication Technology, Covid-19, and Sustainable Development.

An exploratory design is considered suitable to reveal the extent to which educational institutions in Nigeria digitalised teaching and learning amid COVID-19 pandemic, with emphasis on the policies adopted, how adequate there were and the various challenges, if any, that ensued. Exploratory research is employed in research when there is a need to tackle a new problem on which little or no previous research has been done on the subject under investigation (Brown and Brown, 2006; Guragain, 2019). Several studies have been carried out around the integration of technologies in teaching and learning, but none considered this in

relation to Covid-19 pandemic in Nigeria, and to the best of my knowledge, none has specifically looked at the Nigerian ICT policy in Education as a technological policy and how it impacted educational development during the lockdown period.

5.0 RESULTS AND DISCUSSION

This section presents the findings and discussion of the study. The findings of the study are based on the efforts by the Nigerian education sector to implement the ICT policy in education at all levels of education during the Covid-19 pandemic. The following sections present the findings.

5.1 Information Communication Technology platforms employed during the Covid-19 Pandemic

From the literature reviewed above, it is evident that the outbreak of Covid-19 pandemic in Nigeria compelled government at all levels to implement virtual learning for both the primary,

secondary and tertiary education programmes for learners to learn remotely as well as ensure the continuity of academic programmes. Findings from empirical studies revealed that, many primary and secondary schools adopted visual or remote online learning platforms (Chukwuemeka, Chizoruo and Lilian, 2020; Oyeniran and Oyeniran, 2020; Azubuike,2021; Azubuike, Adegboye and Quadri, 2021). According to the cited studies, platforms adopted for learning during the lockdown include radio, television, Google Classroom, WhatsApp, zoom, telegram, Facebook, google, twitter, Instagram, Mobile Classroom App, School Gate, and e-learning portals among others. This corroborates Oke and Fernandes (2020), report that social media platforms such as Facebook and Instagram, WhatsApp are veritable tools for transmitting information and thus can enhance teaching and learning process. At the tertiary education level, there was employment of ICT policies for online teaching and learning including Telegram, Microsoft Teams, WhatsApp groups, Google Class and Zoom (Oyediran et al, 2020; Chukwuemeka et al, 2020; Olatunde-Aiyedun, Eyiolorunse-Aiyedun and Ogunode, 2021). However, it was also revealed that tertiary institutions in Nigeria closed in March 2020

because of the lockdown and only reopened in October same year. This implies that students' progress was impeded as there were variations in years of completion with their contemporaries in other climes. Also, from the literature, remote and online learning was more applicable in private institutions (Ojo, et al., 2021).

5.2 The Effectiveness of the ICT policy in Education during Covid-19 Pandemic in Nigeria.

Judging by what is documented concerning the application of ICT during the pandemic to promote teaching and learning vis-à-vis the policy objectives, it can be established that the effectiveness of ICT policy is still at its lowest ebb. Undoubtedly, findings from literature attest to the application of technology in education but this was not comprehensive, all inclusive and synchronous to guarantee effective and efficient learning as stated in the policy. Based on the reviews, it was found that technological application in education did not match the policy objective of giving all inclusive, enriching and effective learning to Nigerians.

The level of technical knowledge and capacity in the country was inadequate to accommodate the large number of students who were scattered across the country and expected to learn through the several online platforms (Olatunde-Aiyedun et al., 2021). This was largely attributed to factors such as poor network, lack of technology literacy and adequate ICT facilities (Chukwuemeka, et al., 2020), thus corroborating findings of Adeleke (2021) that about 46% of Nigerian population still lack access to internet connectivity and other supportive aids to promote e-learning technology.

In addition, findings from literature indicates that most teachers still lack the needed level of technological literacy to effectively utilise the limited ICT facilities for teaching and learning. Though the policy recognises ICT as a panacea for promoting teaching, it is silent or has not done enough on teacher education and teachers' ICT professional development.

This corroborates studies indicating poor teacher literacy in ICT at all levels of education in Nigeria (Ojelade, Aregbesola, Ekele and Aiyedun, 2020; Culp, et al.2003). Thus, the objective of ICT policy to ensure continuous training and capacity building of manpower to acquit them

with the necessary ICT knowledge and skills needed for effective teaching and learning is still not well realised.

Furthermore, it was found that though concerted efforts were made to provide online learning opportunities to Nigerian students during the pandemic, these opportunities were limited and asynchronously carried out. The developers of the policy did not capture the modalities for ensuring "anywhere anytime" learning, especially in times where situations would necessitate school closure as witnessed during the pandemic. Therefore, the policy objective to widen access to education and increase opportunities for any-where, any-time, any-pace and any-path learning became a herculean task. As a result, only few students and educational institutions with the capacity to access the necessary gadgets and supporting facilities benefitted from the technologically-aided learning. Even at that, learning became asynchronous as many socially and economically disadvantaged students were left out of the train. This aligns with Ohemeng and Ofosu-Adarkwa (2014), that technological disparities between urban and rural areas have a great impact on promoting all inclusive learning. It also aligns with Adegoke et al., (2020) submission that the efforts of education policy to ensure that learning continues for every child in every location did not match the set objectives.

Similarly, the level of implementation of the ICT policy objective to develop and support technical infrastructure that maximizes digital creativity, sharing and innovation has not been adequately carried out. From the available empirical reports, provision of audio/ video learning aids such as: projectors, computers, screen and power supply/generators has not matched the expected results and this became obvious during the lockdown (Ojelade, Aregbesola, Ekele and Aiyedun, 2020), thereby further exposing the inability of the ICT policy to effectively address e-learning in emergency situations.

6.0 Challenges of Implementation

Although the Nigerian ICT policy in education has been implemented to a greater extent, there are obvious challenges that hindered its effective implementation particularly

during the covid-19 era. Among the challenges found in the review include, lack of access to ICT infrastructure, lack and poor internet access, lack of digital competence, lack or unstable power supply and problem of funding.

Evidently, the studies reviewed in this research has shown that both primary and secondary schools are constrained on access to digital devices (Igbokwe, Okeke-James, Anyanwu and Eli-Chukwu,2020; Azubuike et al, 2021). Similarly, students in tertiary institutions lack android phones to participate in online learning (Okeji and Alex-Nmecha, 2021). During the COVID-19 pandemic therefore, access to ICT infrastructure became a major challenge to the digitalisation of teaching and learning especially at tertiary level of education in Nigeria (Oyediran et al, 2020; Azubuike, 2021; Ojo Joseph et al, 2021). This is confirmed by Kerres (2020) that not all universities have e-learning communication tools to participate in online learning.

Internet and electricity challenges were some of the other challenges identified. This is in line with Ogunode finding (2021),that unstable internet and electricity services are a major impediment to the effective application of ICT in Nigeria. During the pandemic, there was unstable internet and power supply to support online learning. The inability of network providers to cover many parts of the country, especially in rural areas, frustrated many schools from switching to the online platform.

Another challenge experienced and which affected the implementation of ICT policy during the pandemic is lack of digital literacy. Most teachers and learners in the country lack the necessary digital skills to participate in online learning (Igbokwe et al, 2020; Eze et al, 2021) and this became a serious challenge during the lockdown. On the other hand, a study on the prospects and limitations to e-learning revealed computer skills remain a constrain to compliance with teaching and learning among instructors in private tertiary institutions in Nigeria (Oyediran et al, 2020). This evidence confirms that both educators and learners lack the digital competencies required to participate in digital teaching and learning.

Funding has always been a problem in Nigeria and education is not an exemption. The issue of funding is so critical to the educational sector and its ability to implement policies including ICT. It is on that premise that Adeoye, Adanikin and Adanikin (2020) averred that such poor budgetary allocation allows deficiencies that inhibits the growth of e-learning and creates challenges when institutions attempt to digitalise teaching and learning during pandemic such as COVID-19.

According to them, this type of budgetary allocation will not give room for infrastructures such as ICT platforms, electricity and personnel training amongst others needed for digitisation of teaching and learning in Nigeria.

7.0 Implications

Notable among the implications is the fact that educational development and process in Nigeria cannot compete favourably with what obtains in other countries of the world due to lack of access to ICT infrastructure, poor internet access, digital incompetence and unstable power supply. This has in no small way affected our e-learning education policies in the country. World over, efficient and effective education policies are driven by ICT as emphasized by UNESCO, this gives reasons for our slow and poor pace of e-learning education policies and programmes.

Also noted is the disparity in graduation period for students in our secondary and tertiary institutions, due to the ills noted in the ICT sector, there seem to be delays in graduations of students due to technical issues experienced especially with those learners who could not access ICT.

Additionally, There are also financial strain and stress where parents and guardian are under serious financial pressures to access and buy data for their children and wards to connect; most parents are in the low or average socio-economic status, after paying tuition fees, they are also faced with the challenge of buying , ICT systems and data.

The inability of our educational system to be proactive in ICT policy implementation and apply technology to promote comprehensive, all inclusive and all time learning through e-

learning platforms constitute a reduced foreign exchange; socio-economically that should have been gotten from foreign students who will come to study in the country. What we observed was little or no foreign students studying in our public tertiary institutions due to the poor education policies including ICT issues.

It has also been observed that educators and learners lack the digital competencies required to participate in digital teaching and learning.

8.0 Conclusion

Significantly, it is worthy of note from the findings above that the digitalisation of teaching and learning by most educational institutions during the Covid-19 pandemic in the country is largely very crucial to ensure sustainable education as contained in the ICT policy. There have been concerted efforts to promote the policy but this has come under serious challenges, especially during the lockdown period. Also, it can be seen that the ICT policy in education did not properly envisage challenges such as lockdown that could necessitate a comprehensive and synchronised learning in times of health emergencies that necessitates school closure. In education particularly, global exigencies have made usage of ICT the most reliable tool for generating , transferring and utilizing knowledge and skills among nations (Ifijeh, Iwu-James & Adebayo, 2016). This has undoubtedly helped in reshaping and sustaining quality education at all times and levels, leading to significant development in the education sector.

9.0 What needs to be done to bring the policy on the right track.

The major strength in effective and sustainable education depends on the integration of diverse technologies in the provision of personalized learning for students anytime and anywhere through remote learning (Fisk 2017; Suvin, 2020). What this means is that policies targeting application of ICT in education must be robust, comprehensive and carefully designed to accommodate the exigencies of the 21st century technology application. Therefore, with a barrage of challenges as revealed in this study, it is evident that educational institutions in Nigeria, specifically those from the public sector and rural areas are yet to meet the

objectives of Nigerian ICT policy through a fully digitalised teaching and learning at primary, secondary and tertiary levels to handle situations where physical mode of learning would become impossible. There is therefore a compelling need for the government to collaborate with stakeholders in other sectors, such as civil societies, business, policymakers, institutional regulatory bodies, educational professionals and the international community. This, the government must do by recognising the role of each stakeholder to ensure an efficient digitalisation of teaching and learning so as to prepare for the future even when an emergency arise. Based on this, the following.

10.0 recommendations are made:

Governments at all levels should increase access to ICT infrastructure through the provision of the needed facilities required for full digitalisation of teaching and learning processes across all levels of education so as to meet the target and objectives of ICT policy and make it more effective in times of lock down.

Through the above, bridge the gap emanating from varied access to digital skills acquisition by ensuring that the cost of technology adoption is low. That is, to ensure the cost of diverse technologies for teaching and learning are reduced and are affordable for both students and educators.

In addition, government should partner with internet, digital, and telecommunication service providers to ensure ICT infrastructure such as internet broad bands and network devices are provided and in good standard and condition to facilitate the digitalisation of teaching and learning process at all levels and at all times to respond to challenges that would warrant closure of schools in future.

The study also recommends that there should be provision for skills training for primary and secondary school teachers as well as lecturers and students in tertiary institutions on how to integrate different technologies in teaching and learning. This will increase the literacy level and make for better utilization of available ICT facilities in our schools, colleges and universities.

Finally, this study recommends more efforts by the Nigerian education sector to ensure that all ICT policies regarding ICT development in Nigerian schools are well conceived, formulated and implemented, taking into consideration the modalities for their implementation in all circumstances. This will help address some of the policy shortfalls or Lacuna that was experienced in the ICT policy during the pandemic, which made it incapable of achieving its objectives. With all these done, an inclusive, comprehensive and sustainable educational development will be possible even in lockdown periods.

11.0 References

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