

THE IMPORTANCE OF IMPROVING ICT USE IN TEACHING AND LEARNING FOR RESEARCH
AND DEVELOPMENT AMID COVID-19 PANDEMIC

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Abstract

Education is the process by which society deliberately transmits its accumulated knowledge, values, and skills from one generation to another through institutions. A sound educational system is therefore prerequisite to achieving progress, from the individual to the society to the economy. Discontinuity in education is a threat to learning in Nigeria and the effect of repeated closures of schools and academic programs on students' learning has adverse effects on the students, the parents and the nation as a whole. The ongoing discontinuity in education is caused by some global issues that affect almost every continents of the world and as a result led to total lockdown. This discontinuity in education was caused by COVID-19, a newly discovered coronavirus. But using emerging computer-based technology as a resource, students' researchers are encouraged to explore their own interests and to become active learners during the lockdown session. Hence, the efficacy and use of ICT facilities which provides e-learning platforms that will foster continued learning cannot be ignored. Thus, this study proposed E-Learning as advancement in Nigerian pedagogy amid Covid-19 Pandemic lockdown by proposing a method that will put an end to discontinuity in educational research and development that emerged as a result of COVID-19 pandemic lockdown. The proposed computer and android applications do not cost the lecturers and the students any more money than data subscription charges from their respective data network providers. Moreover, this framework also allows the institutional management to monitor these academic activities which involves research development and allow the lecturers to upload the courseware and lecture notes to the E-learning platform and interact with the students while the students will also access the e-learning platform to attend their various classes as scheduled by the lecturers or as directed by the school management. Thus, the e-learning platform serves as the meeting point or lecture room for the students, Researchers, Teachers alike.

Keywords: COVID-19, E-Learning, Pedagogy, Information communication technology

Introduction

The global provision of schooling is facing unprecedented challenges as a result of the COVID-19 crisis. Within the span of a few months, 191 countries had closed their schools to deploy social distancing measures in accordance with the World Health Organization (WHO) recommendations. More than 1.5 billion Students worldwide has been affected from pre-primary to university-levels. Classroom based learning has been affected by these closures. While some education systems, teachers, students and parents were somewhat prepared to adapt to existing distance learning programmes and platforms, millions were not because of the inherent problems associated with on line teaching and Learning (Harasim, 2019). In the context of COVID-19 school closures, paper-based and digital distance education platforms have become crucial to the continued provision of education for all. After more than a month of school closures across the world, many students are still struggling with remote learning. Global estimates suggest that 826 million students are without a household computer, 706 million lack internet access at home and another 56 million lack coverage by mobile 3G/4G networks (Onyema, 2020). To better gauge the scope of the impact of school closures and of the ensuing national education responses, a survey of ministries of education developed jointly by UNESCO, UNICEF and the World Bank was recently launched to more accurately inform a collaborative global education response.

Without adequate information and communication technology (ICT) devices, internet/mobile network access, educational resources and teachers' training, students simply cannot partake in distance education to continue on their learning trail. At most risk of being left behind are students from resource-poor areas, remote rural areas, low-income households and poor network zones. In addition, learners with disabilities like screen and hearing impairment, or those who use a different language in the home than in school will require more individualized support. Multiple delivery channels are an essential component to reach all students during this pandemic. A recent UNICEF survey found that 68% of the 127 countries were using a combination of digital and non-digital delivery of remote education (i.e. TV, radio and take-home packages). Even before the COVID-19 related school closures, the

use of radio, video and television for remote learning has proven to be strong components of well-designed numeracy, literacy and financial education programmes for children, youth and adults living in remote and rural communities. However, the implementation and reach of such programmes require the monitoring and support of trained educators.

Distance learning also requires that school systems consider the needs of parents and guardians who have to step in to facilitate learning to ensure the pedagogical continuity of their children, especially for the children in earlier grades (Nursery1-3), computer illiterate students who need more one-on-one support. The ability for parents and guardians to effectively facilitate home-based learning depends on a variety of interacting factors, including their education level, native language and time availability. Understanding parental digital literacy – which could be estimated from SDG 4 Indicator 4.4.1 that assesses ICT skills among youth and adults – is essential for targeting skill support and development for parents. Without ICT skills support for the adults in the home, Students from families with poor digital literacy are likely to fall even further behind.

Developing ICT Skills to Ensure Education Weathers the Storm of Future Crises

Reports of parents, teachers, communities and networks that have developed innovative and makeshift interventions, such as mobile-based Wi-Fi networks as well as on-demand content and textbooks available in clouds to widen digital capacities have certainly ignited optimism. However, these grassroots efforts largely serve as a short-term band-aid solution. Although they are inspiring, more fundamental developments to bolster access to and use of ICT are required both at home and in schools, and for all learners at University level where mental gaps are large. Hastily put-together remote teaching approaches have not proven to be optimal learning experiences and could be putting off some students' interest to learning. School closures such as those currently experienced by the more than 1.5 billion students worldwide are commonplace in some countries due to natural emergencies, conflict as well as budgetary or labour negotiations. Once schools reopen, building skills and support for distance education in the Universities can be emphasized and supported to be enforced to exist. This can help minimize learning interruptions as well as deter learners from leaving school early or dropping out in the event of future crises. In addition, there remains a possibility that the COVID-19 crisis and its ensuing confinement measures may not be short-lived as flare-ups of cases may spark future school closures in certain countries. As some countries begin to reopen their schools, they will need to select innovative remote teaching modalities that blend with face-to-face teaching to ensure that learners are better prepared for future school closures. Thus, given the importance of distance education in the current context and in anticipation of future crises, countries need to take responsibility for monitoring, facilitating and enabling access to ICT in schools as well as in the homes of all learners.

Current measures of ICT availability fall short of capturing the needs in certain countries especially Nigeria as there is very poor power supply here including grid- or solar based and access to computers for pedagogical purposes, which are Fundamental necessities (Leach 2009). At a global level, these indicators are needed to monitor ICT use and detect national trends. However, they are not sufficiently detailed or policy-oriented to provide governments with adequate information to improve access to and use of ICT in education as well as sufficient information on teacher training and digital skills. For instance, counting the number of computers per school or per student poorly reflects the use of computers, which may in fact be minimal if these devices are locked in poorly equipped and furnished computer labs.

Monitoring ICT Use in Schools to Better Inform Education Policies Post-confinement

Reliable data from school-based surveys reported by Leach 2009, can provide the quality ICT use data required to better inform education policy and practices, especially in developing countries like Nigeria. Capturing the complex set of factors involved will paint a more accurate picture of what is available and used by both students and Lecturers. This includes information, such as availability of digital infrastructure; internet connection speed; school activities in which Lecturers use ICT; training received by teachers to empower them to integrate ICT into their practices; strategies implemented by schools to develop digital skills; and perceptions by Lecturer on ICT use in educational research cum development and its barriers. Moreover, the presence of qualified technical staff (e.g. technologist, IT compliant librarians) is required to support the use of ICT in Universities, including ensuring digital access and ICT learning among Lecturers.

Literature Review

Overview of the Concept Education

Education is seen as the process by which society deliberately transmits its accumulated knowledge, values, and skills from one generation to another through institutions. In this regards, education here simply refers to schooling, that is, a formal training acquired in a recognized institution. Education is at the center of a nation's development, through education people are empowered both academically and in skill acquisition. A nation that has a strong stable and functional educational system invariably has not only the powerful instrument to fight and eliminate poverty but also has a solid foundation to build a sustainable economy. The benefit of a good educational system to any nation is further emphasized when the United States Embassy in Nigeria stated that education is the most important way to approach community/national development.

A sound educational system is therefore prerequisite to achieving progress, from the individual to the society to the economy. Goel (2006) corroborates this thought when he observed that the quality of human resource of a nation is easily judged by the number of literate population living in it, that is, education is a must if a nation aspires to achieve growth and development and more importantly sustain it. As human beings attempt to gain knowledge through acquisition of formal learning, modern technology has made it even more possible to look beyond the classroom learning arrangement to update, expand and test what he already knows. Today, the development and introduction of new communication technologies has given both the learners and the instructors the opportunity to search for more information as well as interact positively and progressively from different locations. For many years, educators have been exploring ways to combine different learning styles and student-constructed knowledge with the theory of practice-centered learning. Instead of being passive recipients of knowledge, students are now capable of constructing their own knowledge with guidance from the Lecturer.

Using emerging computer-based technology as a resource, students are encouraged to explore their own interests and to become active educational workers, with opportunities to solve some authentic problems (Edwards, & Clear, 2001). They added that many educators are enthusiastic about the use of this E-Learning advancement in Nigerian Pedagogy amid Covid-19 Pandemic. This new teaching medium have adapted strategies from small-group and interactive techniques to the online world. The present era is regarded as the knowledge age, where information is available anytime, anywhere and to whoever has the appropriate medium to access, share or distribute as applicable. This fact cannot be ignored in this part of the world because, development in any nation has been argued to be dependent on its level of educational advancement and as it is today; no country can claim to be educationally advanced except it embraces technology for its educational activities (Yusuf, 2005). Learning is becoming more complex, especially in a developing nation like Nigeria as a result of high volume of information the learners are expected to process and cope with at all levels of our educational system, therefore, every serious country whose aim is to compete favourably in today's knowledge should rethink her process of educating her young ones. Feenberg (1999) proposed five reasons for technology use in education: (1) motivation, (2) distinctive instructional abilities, (3) higher productivity of teachers, (4) essential skills for the Information Age, and (5) support for new teaching techniques. According to Harasim (2019), the internet is particularly compatible with the way students now prefer to learn. Online education offers more than convenience. For all the mythology of the classroom, many students show up and snooze rather than learn, but the internet forces students to focus and to be active participants in learning rather than empty vessels into which academics try to pour their knowledge.

Educational institutions are using the provided advantages such as simple and fast creation of micro content, social factor which ensures instantaneous communication and feedback which in their own turn promote further creation and improvement of digital content as well improving communicative skills which are very important in the study process (Scardamalia, 2012). Some institutions in the attempt to create a safe study environment choose to build their own inner networks, others choose integrative approach and use already existing media open to the public and try moving the study process into the public space creating studying communities there. Students in digital environment really profit communicating with their peers and lecturers who could enable the students to achieve a higher level of understanding. Online discussions enable students to improve their literacy skills. The use of internet in education requires focusing on the interests and needs of the students as well as enhancing connections with the students not only due to physical presence in the classroom.

Amadi and Urho (2015) analyzed the effects of discontinuity in education as a result of strike actions on educational development management of Universities with a survey design. The study selected seventy-five non-academic staff and sixty academic staff from each population of the university which total one hundred and thirty-five respondents.

The results obtained showed irregularity of academic programmes, examination malpractices and cultism amongst students, certificate racketeering, erosion of dignity and respect of higher education are the effects of strike actions. The measures to eradicate strike actions in Universities include stifling all aspects of collective bargaining, both employees and managers to allow third party in negotiations and both labour and management to base subsequent negotiations on the rules and regulations binding labour matters. They, therefore, recommended that previous agreement on salaries, fringe benefits and other working conditions between labour and management government should be respected as at when due. Adavbiele's (2017) study was designed to x-ray the implications of discontinuity in education as are sult of incessant strike actions on the implementation of Technical education programme in Nigeria. The study took an exploratory view on the concept of discontinuity in education as a result of strike actions in Nigeria with particular references on notable strike actions that have occurred in Nigeria. The types of strike were explained and some of them examined include: recognition strike, economic strike, jurisdictional strike, sympathy strike and wildcat strike. The causes of strike actions were also examined and they include: unfair treatment to the employees/victimization, violation of legislation and poor application of the provision of collective bargaining. The implications of discontinuity in education as a result of strike actions on Technical education programme were examined also. A major contribution made in this paper was in the area of repositioning the mindset of stakeholders on the implications of these incessant strike actions on the implementation of Technical education programme in Nigeria. One of their commendations was that the Government should ensure adequate provision of infrastructures and facilities in various institutions.

E-Learning

Rosenberg (2001) defines learning as the process by which people acquire new skills or knowledge for the purpose of enhancing their performance'. He explains that the perceptions of learning in organizations are undergoing a distinct transformation. First, training should no longer only focus on the act of training but must demonstrate a positive impact on performance or outcomes. As the world is changing the learning scenario is changing with the change in the introduction of information and communication technology, which gives room to the new concept called e-learning. In his book Rosenberg (2001) defines e-learning as a networked phenomenon allowing for instant revisions and distribution. In addition, it is delivered using standard Internet technology. E-learning goes beyond training and instruction to the delivery of information and tools to improve performance. The benefits of e-learning are many including cost-effectiveness, enhanced responsiveness to change, consistency, timely content, flexible accessibility, and providing customer value. The discussion emphasizes the need for organizations to build a strategic foundation for e-learning, addressing the emerging approaches to e-learning in addition to synthesizing other learning efforts of the organization.

Methodology

The methodology adopted for this study is the Agile Teaching/ Learning method. This methodology emphasizes agility, communication and learning processes. This study reveals that, despite the fact that COVID-19 pandemic has led to partial and complete lockdown of many countries, yet, academic activities can still be going on despite the lockdown. Many studies have established the importance of distance learning programmes, though; distance learning programme does not solely depend on the use of computer technologies but also involved physical administrative activities (Hasim 2019). He further proposed a framework (see Figure 1) that will allow lecturers and students to participate in academic activities through the use of some open source computer and android applications. Using these computers and Digital Smart Phone (android and iphone) applications do not cost the lecturers and the students any additional monetary implication other than data subscription charges from their respective data network providers. Moreover, this framework also allows the institutional management to monitor these academic activities. The framework indicates that the lecturers will upload the courseware and lecture notes to the E-learning zones, while the students will also access the e-learning zones to attend their various classes as scheduled by the lecturers or as directed by the school management. Thus, the e-learning zone serves as the meeting point or lecture room for the students and the lecturers alike. Also, the e-learning zone allows the students to take and submit assignments; the lecturers can as well assess the students by the use of various technical functions embedded in the e-learning zones.

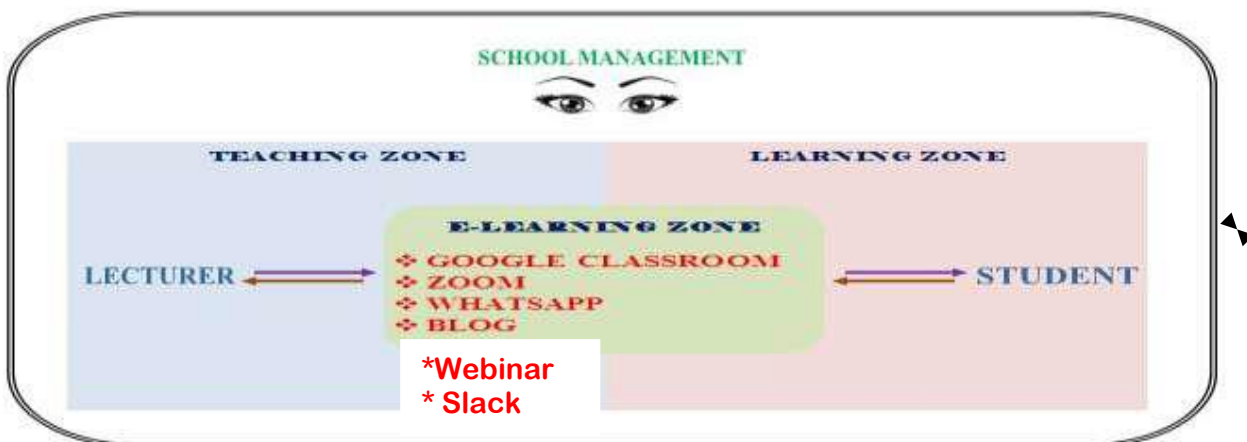


Fig. 1: Teacher Student Learning Management System: Harasim (2019)
Implementation of TSMS (Teacher Student Learning Management System)

The e-learning zone is the combination of android, iphone and computer applications for the purpose of teaching and learning. The following are the android / i phone and computer software applications that are proposed to be used at this zone.

Google Classroom: This is a free web service that is developed by Google for schools that aims to simplify creating, distributing and grading assignments in a paperless way with the purpose of streamlining the process of sharing files between lecturers and students.

Zoom: This is a video communication that provides video telephony and online chat services through a cloud-based peer-to-peer software platform that is used for distance education and social relations.

WhatsApp: This is a freeware, cross-platform, messaging and voice over IP service owned by Facebook, Inc. It allows users to send text messages and voice messages, make voice and video calls and share images, documents, user location and other media.

Blog: This is an online journal or informational website that displays information in a reversed chronological order with the latest post appearing first. It is a platform where a writer shares his/her view on any subject.

Webinar: This is a seminar conducted on the internet using video conferencing software. A key feature of a webinar is its interactive elements and the ability for a presenter to give, receive and discuss information.

Slack: This is a proprietary business platform developed by American Software company Slack Technologies. It is just a messaging app on steroids. It is meant for team collaboration

Advantages of the TSMS

Good feedback mechanism: This framework ensures adequate feedback, as the students can interact with their colleagues and lecturers alike. This allows them to ask and answer questions that seem difficult or not well understood. Moreover, since the e-learning zone is padded with various types of applications, it will be easy for any student to use any of the platforms to communicate with their lecturers and their fellow colleagues.

Continuous learning: In this regards, this framework allows continuous learning, as there is no obstruction by either the lecturer or the student to the scheduled classes on the e-learning zone.

Removes the cost of developing individual distance learning platforms: With this framework, there is no need for any institution of learning to develop any distance learning application of their own since this framework presents the open sources distance learning applications.

Cheap cost of implementation and accessibility: In this framework, there is no implementation or maintenance fee required, since the e-learning platform is open source and can be used by any individual free of cost. Nevertheless, the network provider charges data subscription fee for accessing the internet.

Makeup classes: The multiple platforms technique will allow any student who missed a class to access other platforms for makeup classes since the courseware is available on other approved e-learning platforms and is available for use any time by the students.

Exposure to new teaching method and platform: Though all the e-learning platforms on the e-learning zone might not be new to some, yet, it will be a means of exposure to new teaching methods and platforms for many others.

Disadvantages of the TSMS

Instability of electrical power supply: The first disadvantage to be addressed here is this because of the current state of the epileptic power supply Nigeria is facing as a country. This poses a major threat to the smooth running of this system as many lecturers and students will spend so much on generator and fuel usage.

Network problem: The unpredictable network problem is another issue here as some areas in the country may have network issues at different times of the day.

Internet Access (Data subscription): The rate at which the data subscribed are deducted is quite alarming and this can be a major drawback as lecturers and students will need to be subscribing from time to time so that they can be available for the online classes.

Affordability of learning equipment (Smart Phones and computers): Not all students have and can afford Smartphones and computers because some parents are still struggling to fund their children's education and may not be able to provide smartphones/ i phones and / or computers to them at some point in their studies.

Inadequate technical knowhow: Since it is not all the lecturers or students that are aware of some of the platforms, some people will need training, guide or help in order to use the platforms successfully.

Environmental Distraction: As observed from the society, series of environmental distraction can be a drawback to this system. These could include various addictions, house chores, family influence are.

Duplication of courseware on different learning platform: Since the platforms offer similar services, the materials, courseware and lecture notes will be available on all the platforms therefore duplicating the materials on the platforms.

Unexpected shutdown operation of any of the e-learning platform will lead to obstruction in learning:

Some technologies and application have either been bought over by new people with new terms and conditions or go into extinction fully.

Conclusion

Education is the solution that liberates an individual from ignorance and slavery while the university is the brainbox of a nation as it plays a lead role in ensuring the transformation of countries from developing to developed nation. This study proposed a framework that allows lecturers and students to participate in academic activities during the lockdown session through the use of some open source computer and smart phone applications that also allows the institutional management to monitor ongoing academic activities. The framework indicates that the lecturers will upload the courseware and lecture notes to the E-learning zones and interact with the students while the students will access the e-learning zones to attend their various classes as scheduled by the lecturers or as directed by the school management. Thus, the e-learning zone serves as the meeting point or lecture room for the students and the lecturers alike.

Recommendations

This study, therefore, recommends the following:

1. The Federal Government as well as private educational institute owners should look into this proposed framework with the e-learning platforms used and practice continued education during the lockdown session and can also come up with other e-learning platforms that might have not been included here to achieve effective and continued education despite the ongoing global pandemic lockdown
2. More so, Stakeholders like NCC (National Computer Commission), buoyant companies like SHELL Nigeria, NNPC can give grants to University students that will solely be for them to purchase Digital Learning Devices like computers and Smartphone in order to participate actively in e learning.
3. School Management can organize seminars for Lectures in order to educate them on the use of this novel Learning Management System especially for non-technical Lecturers who may not be conversant with the use of modern ICT technologies.

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