

An Assessment of the Use of Emerging Technologies in Education in Kogi State Tertiary Institutions in the New Normal.

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Date of Submission: 20-04-2023

Date of Acceptance: 30-04-2023

ABSTRACT.

The emergence of covid-19 pandemic, academic strikes and frequent holidays that often disrupt academic calendar necessitated the quest for integration of new approaches to teaching and learning in tertiary education in Nigeria. Hitherto, the adoption of common and available technologies to teaching and learning process has improved classroom activities in Kogi state tertiary institutions. Emerging technologies are the recent tools and ideas used to improve learning activities and instruction in an educational environment. This study seeks to provide an assessment of the impact of emerging technologies implemented by Kogi state tertiary institutions in post covid-19 pandemic era. A total of 251 responses were duly collated using an online survey instrument. The study revealed that both staff and student of Kogi state tertiary institutions have been utilizing available Emerging Technologies (ET) to support the teaching and learning process. Among the available emerging technologies (ET) includes web 2.0 tool such as WhatsApps have been fully utilized for sharing of lecture materials/assignment prior to covid-19 and is still being in use till date. The study also revealed that lecture method and blended method is currently implemented in Kogi state tertiary institutions, and that it has the potentials to improve academic performance of students if properly utilized. The paper therefore recommends that all stakeholders in tertiary education in Nigeria should put more efforts in the implementation and utilization of emerging technologies in the classroom

Keywords: Emerging Technology, pandemics...

I. INTRODUCTION

The emergence of COVID-19 pandemic in late 2019 led to complete lockdown across nations of the world including Nigeria and this resulted to negative effects on the economy including the educational sector as schools were totally closed

down during the period. Tertiary institutions in Nigeria such as Colleges of Education, Polytechnics and Universities (both State and Federal owned) were initially locked down completely and closed from academic activities with the exception of some private universities that engage their students via virtual learning platform. When the COVID-19 pandemic has gradually reduced, this pandemic becomes the new normal in the society such that individuals have to adjust the way they engaged in various activities. During the covid-19 pandemic, traditional classroom method of teaching and learning was no longer possible, as large gathering of any form was not allowed due to the nature of the pandemic. In their view, Onyeawuna, & Ogon (2022) stated that African tertiary institutions were left with no other choice than to adopt distance learning in order to continue with academic activities during the lockdown.

The Federal Ministry of Education in Nigeria later encouraged tertiary institutions to adopt electronic-learning technologies such as web 2.0 tools, open-source learning management systems and virtual learning platform such as Zoom, Google classroom and Google Meet to support teaching and learning process in the educational system. Olutola & Olatoye (2015) stated that electronic learning is one of the most efficient tools for advancing knowledge, skills and development in any nation. They noted that e-learning is necessary for quality education in Nigerian tertiary institutions where future leaders are trained and made to acquire the high-level technical capacities needed for economic growth and development.

Both the government and management of tertiary institutions have encouraged and persuaded students and teachers to use these technologies despite the fact that they were not fully prepared to use them before the lock down. In some institutions, lecturers were able to setup classes, post course material on their available learning

platforms such as Google classroom while students were able to access and obtain learning resources through the same medium.

The various forms and variants of Covid-19 that later came surfaced in late 2020 as well as the frequent interruption of learning activities has necessitated tertiary institutions to adopt hybrid approach to learning which combine face-to-face method with the use of technology in the classroom. This study focuses on the assessment of some emerging technologies adopted by tertiary institutions in Kogi State from 2020 to 2022 in the new normal.

Emerging Technologies Adopted by Tertiary Institutions in Kogi State.

Prior to Covid-19 pandemic, the face-to-face lecture method dominates teaching and learning in various tertiary institutions in Nigeria. The need to adopt new skills, innovations such as the integration of information technology into the classroom system that would help to constantly engage students in academic activities become inevitable under the new normal. Hughes & Acedo (2016) stated that innovative technology enhances the learning process for students of all ages as it helps learners to learn more and interact with the world. New innovations and learning approach in the field of education becomes inevitable under the new normal that will help simplify the teaching and learning process.

Emerging technologies are recent tools and ideas used to improve learning activities, instruction and interconnectedness in an educational setting. They help to simplify the teaching and learning process and improves the quality of contents, interactions, and teaching methods. George (n.d) defined emerging technologies as tools, concepts, innovations and advancements utilized in diverse educational settings to serve varied education-related purposes. He noted that emerging technologies may or may not be new technologies, evolving organisms that exist in a state of “coming into being,” as well as potentially disruptive, but their potential is mostly unfulfilled. Onyema (2019) opines that the adoption and usage of emerging technologies assist educators and students to interact more outside the classroom, and to set up classes at any time and place. These technologies have the ability to modify the teaching and learning process in such a manner that several learners are accommodated, enhanced research activities as well as improving the academic performance of students and job performance of staff in an academic environment.

Akshay (2019) listed popular emerging technologies used in education to include artificial intelligence, learning management system, school management system, cloud computing, augmented and virtual reality, internet of things (IoT), mobile learning, virtual and remote library and 3-D printing. Cukurova & Luckin (2018) viewed emerging technologies as those that have the potential to change the current state of affairs in education but are not limited to virtual reality implementations, augmented reality implementations, mobile learning devices, physical computing tools, internet of things hardware with sensors and technologies that allow collaborative learning at a great scale.

Emerging technologies are being deployed by tertiary institutions in countries where electronic learning have been fully implemented. Due to technological factors such as internet access, high cost of computing devices and power related challenges in Nigeria, it is almost impossible for tertiary institutions to implement full e-learning approach in their institutions. With the aid of available open-source web 2.0 tools (such as WhatsApp, Facebook, You-tube), virtual conferencing platforms (such as Zoom, Google Meet) and learning management system (such as Google classroom, Moodle), students can interact and share learning materials in their various departmental group forums. Lecturers can also setup classes, post announcement, give assignment/quiz and received feedback messages through these technologies.

II. STATEMENT OF PROBLEM

The face-to-face lecture method which is usually dominated by lecturers in the classroom environment while students only receive instructions has been practiced in most tertiary institutions in Kogi state before the emergence of COVID-19 pandemic. When academic activities commenced after the global lock down, there were still variant forms of covid-19 which create uncertainty as to whether large classroom activities should be allow to continue or not. Building large classrooms and maintenance of existing infrastructure by the management of tertiary institutions became a difficult task as a result of the ravaging effect of covid-19. There was also disruption of academic activities emanating from disagreement between the federal government and academic staff union of universities/ other tertiary institution over poor funding of tertiary institutions in Nigeria.

The problems mentioned above have prevented smooth and effective academic activities

in Kogi State tertiary institutions. This situation if it is not properly checked and addressed will result to poor development of the entire Kogi state in future. The adoption of emerging technologies into Kogi state educational system can help to resolve the problems mentioned above. This study therefore seeks to assess the level of integration of emerging technologies by tertiary institutions in Kogi state.

Objectives of the Study

This study aims at providing an assessment of the impact of emerging technologies implementation by Kogi state tertiary institutions in post covid-19 pandemic era. The specific objectives of this study include:

1. Assess the level of technology tools implemented prior to the emergence of covid-19.
2. Identify specific emerging technologies used by Kogi state tertiary institutions in coping with the new normal post pandemic era.
3. Assess the benefits of emerging technologies for students of Kogi state tertiary institutions.

III. REVIEW OF RELATED LITERATURES

Several studies have been carried out on the best practice to constantly engaged students in tertiary institutions due to the disruption of academic activities usually experienced in some developing countries. Gurajena, Mbunge & Fashoto (2021) in a study on how best to engage students outside classroom revealed that emerging technologies have transformed the teaching and learning process by supporting educators and students to interact more outside the classroom at any time as well as providing new forms of teaching for students to acquire the necessary skills to develop in this globalized world,

In a related study by Edeh (2019) on emerging technologies in teaching and learning process in Nigeria reveals that the integration of emerging technologies in teaching and learning process has changed all facets of educational process ranging from; the nature of classrooms, quality of content, methodologies, mode of students' engagement, and evaluation. He noted that emerging technologies has increase the interest of learners, and the quality of outcome in educational process and innovations, creativity and flexibility to learning, thereby equipping both the educators and the learners with necessary problem solving and survival skills in a digital world.

The integration of the mobile technology into education has put learning in the palm of both teachers and their students. Apart from its innovativeness, its portability and ease of use has

made it more versatile than desktops and laptop computers. Mobile computing devices such as iPads, Tablets and Screen touch phones have become a technological tool of choice in the classroom. Teachers could help students re-focus the use of their mobile phones for more rewarding functional use (Moemeke, 2019). Osumah & Ikhara (2016) conducted a study on utilization of mobile devices for improving science education and reported that mobile devices have prospective ways of improving the teaching and learning processes as the tools are portable and easy to be carried about everywhere by both teachers and students.

Emerging technologies such as Learning Management System (LMS) has improved the learning and teaching experience as well as academic performance of students. Learning management system is software that provide virtual learning environment for tertiary institutions to create and manage online courses for their students. According to Ismaila (2022), learning management system offers various tools such as communication tools, student assessment tools, attendance submissions, performance evaluations and other supporting classroom learning and teaching tools which allowed students to be divided into various groups and classes. He also stated that learners who use a learning management system can learn at their own pace with time flexibility, learn from their peers, reviewing of class notes, and videos. LMS as a web-based application enables users to access the web with modern computing devices, as it is specifically designed to create, distribute and manage the delivery of educational content to learners. AI-Busaidi & AI-Shihi (2020) noted that learning management system has faced a massive growth in usage due to the emphasis on remote learning during the covid-19 pandemic as it enable students and teachers to interact via the internet and facilitates sharing of course related information and resources.

Learning management systems have been found useful as they allowed courses to be delivered to students in both asynchronous and synchronous mode. Aldahwan, NoufAlsaed & Nourah (2020) stated that LMSs represents the best way to provide educational content in higher education settings by supplying worldwide material through their enormous benefits such as improved and faster learning, cost-effectiveness, effective interaction between learners and teachers.

One of the emerging technologies popularly utilized by students in tertiary institutions is Web 2.0. It is a term used to describe the current state of the internet where all kind of users including students and teachers create content and

share information individually as well as in group forums. The development of Web 2.0 technology as a social media has changed the way students create knowledge and share their thoughts and opinions with others, creating new ways of organizing and connecting with family and friends. It has great benefits to tertiary institutions users such as their ability to improve communication and interaction through web applications such as Facebook, WhatsApps, Instagram, Twitter, Telegram and YouTube; these software applications enhanced interactive, collaboration, and knowledge sharing. In their view, Kenneth & Roelien (2019) stated that Web 2.0 technologies have the ability to transform, accelerate, develop, and improve skills; to encourage and involve learners to participate; to strengthen teaching; and to help universities change. Olorunsola & Ogwueleka (2021) opined that internet and social media have brought about a 360-degree change in the communication process, which have resulted to significant impact on communication efficiency in the teaching and learning process by facilitating clarity, ease, speed, security and prompt feedback in the communication process.

Cloud computing is a technology used in tertiary institutions, that allows both students, teachers and administrators to access information from their computing devices without the installation of a specific program and this make access flexible and facilitates collaboration. Cloud computing solution has been widely adopted recently in tertiary institutions as it provides an infinite amount of computing resources, storage facilities from data centers, and network resources which suits big data challenges for individuals and organization. Arun (2017) stated that cloud solution allows students save on expensive textbooks through the provision of digital contents thereby providing opportunity to low-income students to get access to the same quality of learning material as other students. Both teachers and students can store important documents on public cloud storage such as the services offered by Google cloud. Learning materials stored on the cloud are not outdated as against printed text and this makes it easy to update digital content on regular basis. Cloud computing solution allows access to applications and educational material to diverse range of students through internet access at anytime, anywhere.

The application of Artificial Intelligence (AI) technology in education has improved the quality of teaching as well as the way students learn as it has enhanced teachers' abilities, help teachers provide students with personalized and precise

teaching guidance (Murphy, 2019) that they could not offer before, and significantly improve the efficiency of imparting knowledge. According to Kwet & Prinsloo (2020), the appearance of AI technology has changed traditional education and teaching methods through face recognition, text recognition, human body recognition, voice interaction, audio recognition as well as provides technical support for the construction of smart campuses. In their view, Jiahui, Salmiza & Yufei (2021) noted that AI simulates human listening (through machine translation and speech recognition), speaking (through speech synthesis, human-computer dialogue), watching (through computer vision, image recognition, text recognition. Yufei, Saleh, Jiahui & Abdullah (2020) also opined that AI technologies such as computer vision, natural language processing, and intelligent adaptive learning have changed the traditional teaching and learning, thus have provided universities and teachers with new ideas for teaching reform. Parry & Battista (2019) stated that emerging technologies such as Artificial Intelligence and robotics are currently used by organizations to automate simple and repetitive tasks as well as to make complex decisions quick to get more accurate results.

IV. METHODOLOGY

In assessing emerging technologies utilization by faculty and students of Kogi state tertiary institutions, descriptive survey research design was adopted. The population of the study consists of all the students in the Nine (9) tertiary institutions in the State, which include three (3) colleges of education, two (2) polytechnics and three (3) universities. An online survey method was used to collect quantitative data from 251 respondents. The online survey questionnaires used were classified into four (4) categories described as follows: **Category A** – Demography data, **Category B** - Level of technology tools implemented prior to the emergence of covid-19, **Category C** - Specific emerging technologies used by Kogi state tertiary institutions students from 2020 till date and **Category D** – Benefits of emerging technologies of students of Kogi state tertiary institutions. The link to the Google Survey form used for the study was sent to the students of the various tertiary institutions in Kogi state.

V. DATA ANALYSIS AND RESULT

Category A – Demography data:

The data features include name of institutions, level of academic programmes and gender. A total number of 157 (62.5%) male students and 94

(37.5%) female students participated in the study as represented in figure 1.

Table 1.0: Number of responses received from Kogi State Tertiary Institutions of Emerging Technologies

Institutions	No. of Responses
Colleges of Education	104
Polytechnics	37
Universities	110
Total	251

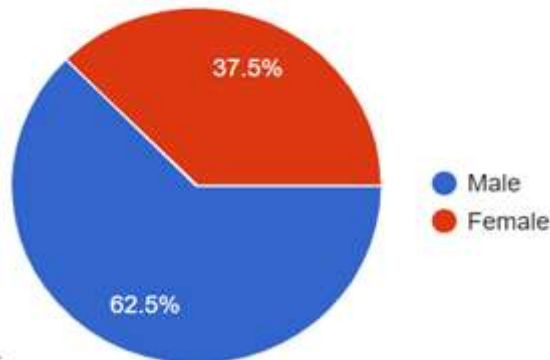


Figure 1 – Gender responses

Table 1.0 above shows the dataset of responses as represented by various institutions in the state.

Category B – Table 2.0: Level of technology tools implemented prior to the emergence of covid-19

Question/Statement		Low	Medium	High	NA	Total	Mean
What is the level of usage of specific e-learning platform in your institution before covid-19	Response	98	92	24	37	251	62.8
	%	39.0	36.7	9.6	14.7	100.0	25.0
What is the level of usage of social media tools for sharing academic information in your institution before covid-19	Response	83	105	57	6	251	62.8
	%	33.1	41.8	22.7	2.4	100.0	25.0
What is the level of usage by your lecturers in terms of sharing learning material in your department before covid-19?	Response	75	88	80	8	251	62.8
	%	29.9	35.1	31.9	3.2	100.0	25.0
What is the level of ET usage by your lecturers in terms of giving out assignment before covid-19?	Response	52	114	78	7	251	62.8
	%	20.7	45.4	31.1	2.8	100.0	25.0

		Lecture method	Electronic method	Blended method	Total	Mean
What teaching approach is adopted in your dept before covid-19	Response	100	47	104	251	83.7
	%	39.8	18.7	41.4	100.0	33.3

Category C - Table 3.0: Specific emerging technologies used by Kogi state tertiary institutions students from 2020 till date.

Question/Statement		Facebook	WhatsApp	Telegram	Instagram	Others	Total	Mean	
What Web2.0 technologies used for Comm & Info sharing between 2020-tilldate	Response	18	220	5	1	7	251.0	50.2	
	%	7.2	87.6	2.0	0.4	2.8	100.0	20.0	
		Moodle	Canvas	Blackboard	Google Classroom	Customized LMS	NA	Total	Mean
What type of e-learning platform used in your institution between 2020-tilldate	Response	17	11	49	76	12	86	251	41.8
	%	6.8	4.4	19.5	30.3	4.8	34.3	100	16.7

		Website/LMS	Email	WhatsApp	NA	Total	Mean	
What are the common ET used in your dept/institution between 2020-tilldate?	Response	22	51	134	44	251	62.8	
	%	8.8	20.3	53.4	17.5	100.0	25.0	
		Zoom	Google Meet	MS Team	Others	NA	Total	Mean
What virtual learning platform utilized for lecture, practical & meeting between 2020-tilldate?	Response	48	42	28	63	70	251	50.2
	%	19.1	16.7	11.2	25.1	27.9	100.0	20.0

Category D – Table 4.0. Benefits of emerging technologies utilized by students of Kogi state tertiary institutions.

Benefits of Emerging Technologies (ET)		SD	D	N	A	SA	Total	Mean
ET allows students to learn effectively from subject experts	Response	14	10	32	131	64	251	50.2
	%	5.6	4.0	12.7	52.2	25.5	100.0	20.0
It increases students's level of assimilation by re-visiting the stored material any time	Response	17	8	29	126	71	251	50.2
	%	6.8	3.2	11.6	50.2	28.3	100	20.0
ET allows students to acquire basic technology skills needed in workplace	Response	12	10	31	130	68	251	50.2
	%	4.8	4.0	12.4	51.8	27.1	100.0	20.0
ET improves quality of education through unlimited access to material & easy assessment	Response	15	7	28	139	62	251	50.2
	%	6.0	2.8	11.2	55.4	24.7	100.0	20.0

VI. DISCUSSION

The tertiary institutions where the dataset were collected include: Federal College of Education Okene, Kogi State College of Education Akpan, Kogi State college of Education Technical – Kabba, Kogi state Polytechnic Lokoja, Federal Polytechnic Idah, Federal University Lokoja, Kogi State University Ayamgba, Confluence University of Science & Technology Osara and Salem University Lokoja (privately owned). NCE1, ND1 and 100L undergraduate students were excluded from participating in the study exercise since they have little or no technology experience on campus. Table 1.0 show that students from the university sector responded more than others while the male students responded more than the female students.

The level of usage of e-learning platform, social media, sharing of lecture materials/assignment prior to covid-19 by kogi state tertiary institutions shows that both students and lecturers were already utilizing the available technologies in their institutions (see table 2.0). Table 3.0 revealed that Lecture method (39.8%) and blended method (41.4%) dominated classroom activities. The study reveals that WhatsApps platform is reported as the highest web 2.0 platform (87.6%) for communication and information sharing and this is in agreement with (Gurajena, M bunge & Fashoto, 2021) that emerging technologies have transformed the teaching and learning process by supporting educators and students to interact more outside the classroom. Google classroom (30.3%) dominated the learning management system utilized by Kogi state tertiary institutions and 34.3% reported that LMS are not available in their institutions. Among the common and available emerging technologies utilized in post covid-19 till

date include WhatsApps (53.4%) and email (20.3%), while virtual meeting forum for online classes and practical session are Zoom (19.1%), Google Meet (16.7%), Microsoft Team (11.2%), Others (25.1%) and 27.9% was reported as Not Available.

In table 4.0, the study shows that some of the benefits of emerging technologies are, allows students to learn from subject experts (Agree – 52.2%, SA – 25.5 above mean 2.0%), increases the level of assimilation by revisiting the course material at any time (Agree - 50.2% - SA – 28.3%) as in agreement with (Edeh, 2019) that emerging technologies has increase the interest of learners, and the quality of outcome in educational process and innovations. The study also revealed that ET allows students to acquire basic technology skills (Agree - 51.8%, SA - 27.1%), this is in agreement with Kenneth &Roelien (2019) that Web 2.0 technologies have the ability to transform, accelerate, develop, and improve technology skills.

VII. CONCLUSION.

In post covid-19 era, both students and teachers of Kogi state tertiary institutions have been utilizing common and available emerging technologies to support the teaching and learning process. The study shows that emerging technologies have improved the quality of education with the tertiary education sector. This conforms to the assertion made by Aldahwan, Nouf Alsaeed & Nourah (2020) that emerging technology such as Learning Management System (LMS) represents the best way to provide educational content in higher education settings by supplying worldwide material through their enormous benefits such as improved and faster

learning, cost-effectiveness, effective interaction between learners and teachers.

In view of the afore-mentioned benefits, the researchers wish to suggest that all the stakeholders in tertiary education sector in Kogi state should put more efforts in the implementation of emerging technology in the various tertiary institutions in Kogi state. The Government (State and Federal) should increase budgeting allocation to education sector to ensure proper implementation of technology tools/ICT infrastructure needed in the various campuses. The management of the tertiary institutions should ensure that both lecturers and students are trained and re-trained yearly on the use of e-learning facilities and also encourage the deployment/implementation of common and available emerging technologies in their institutions. Parents and guardians should provide mobile devices such as laptops, tablets and screen touch phones and data to their wards needed to access internet and learning process. The lecturers should ensure that they utilized the various emerging technologies available to them to engage their students constantly within and outside the school calendar. Finally, all students in Kogi state tertiary institutions should ensure that they adjust to the new technology education necessitated under the new normal by utilizing their mobile devices properly for academic purpose.

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