LEVERAGING CLOUD-BASED PEDAGOGICAL APPROACHES: A PRE-REQUISITE FOR CONTINUING TEACHING AND LEARNING ACTIVITIES IN COVID-19 ERA

Ebere Sampson Wagbara, PhD[1]
Department of Educational Foundations,
Rivers State University.

Catherine Ugada[2]
Department of Educational Foundations,
Rivers State University.

ABSTRACT

Cloud-based pedagogical tools are important for giving teachers and students opportunities to adjust in teaching and learning during COVID-19 pandemic. To this end, the study centred on leveraging cloud-based pedagogical approaches as a pre-requisite for continuing teaching and learning activities in Covid-19 era. The study was guided by three objectives and three research questions. The descriptive survey research design was used in this study. The population of the study was 6,250; made up of 1,250 teachers and 5000 students in the 20 public senior secondary schools situated in Obio/Akpor Local Government Area of Rivers State, Nigeria. The sample of the study was 399 respondents; comprising 159 teachers and 240 students. The Taro Yamane formular was used to determine the sample size. The simple random sampling technique was used to select the sample of 399 respondents. The instrument for data collection was a self-structured questionnaire titled: "Leveraging Cloud-Based Pedagogy Questionnaire". The instrument was validated by two experts in Measurement and Evaluation in Rivers State University, Nigeria. The reliability of the instrument was established using test re-test method. A reliability co-efficient of 0.76 was obtained, which showed that the instrument was reliable. Mean and standard deviation were used in answering the research questions. Key findings of the study revealed amongst others that during the periods cloud-based tools were used for teaching and learning, teachers and learners who were communicating via internet facilities found out that learning was very much at the comfort of the students, and teachers had access to express themselves more to a larger audience without dealing from fatigue afterwards. Based on the findings of the study, it was recommended amongst others that exposing students to cloud-based learning will improve their quest for learning and will also enhance the teaching/learning process.

Keywords: *Cloud Based, Pedagogy, E-learning, Virtual Learning, Google Cloud, COVID-19*

INTRODUCTION

Coronavirus disease (COVID-19) according to the World Health Organization (n.d), is an infectious disease caused by the SARS-CoV-2 virus. The virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols. Corona virus disease is a contagious illness that is easily transmissible from person to person. In December 2019, the first known case was discovered in Wuhan, China (Hinshaw and Mckay, 2021). Corona virus (also known as COVID-19) are a vast family of viruses that can cause symptoms ranging from the common cold to more serious conditions.

Some symptoms of Covid-19 include headaches, nausea, vomiting, loss of taste and smell, congestion of the nose and muscle pains, coughing, running nose, and sore throat, as well as fever, diarrhoea, and breathing difficulties (Islam, 2020). From the first quarter of the year 2020, the world witnessed a high and unimaginable spread of the coronavirus disease across virtually all countries on planet earth; with a considerable number of deaths recorded. In an effort to curtail the spread of the disease, many countries in the world, including Nigeria, shut their borders and orders were given by the government for total lockdown which restricted movement of people and activities in the country.

The educational sector as well as other aspects of the economy suffered substantially as a result of the closure of schools for a lengthy amount of time. The closures disrupted academic calendar of educational institutions and had students stay at home without learning for a long period of time. The majority of parents were worried and concerned about the spread of the virus and how to cater for their family needs during the period of lockdown; thus, leaving them with limited time to focus greatly on educating their children and wards. As a way to ensure learning continued in schools, the United Nations Education, Scientific and Cultural Organization (UNESCO) in the year 2020 recommended the use of e-learning platforms by education providers. Consequently, most schools around the world including Nigeria shifted to the adopted virtual learning tools to ensure teaching and learning continued without face-to-face contact between learners and teachers.

Online learning approach was adopted by most schools across the world, and students were provided with learning materials and pre-recorded instructional videos. Remote learning was also done through the use of learning management systems such as Canvas, Zoom, Edmodo, Google Classroom, and Microsoft Team. Additionally, the course outline, notes/subject material, and recorded teachings were forwarded to students' email addresses, uploaded to learning software, and forwarded to students' WhatsApp platforms. Learning online in asynchronous and synchronous modes was quite achievable. In asynchronous learning, students could access and complete learning activities at their own leisure and convenience, whereas in synchronous learning, learning activities are conducted through live videos or audio with rapid feedback (Itrastinski, 2008).

In recent years, the learning environment has seen a significant transformation, moving away from traditional face-to-face instruction and the use of chalkboards to an information and communication technology-enabled learning environment. E-learning is the term used to describe this type of learning. This type of learning can take place in a variety of settings, including online and offline environments. Known as "virtual learning," online education takes place over the internet in real time or with a delayed response. Offline learning, on the other hand, is the use of information and communication technology (ICT) tools to enable learning without the need to connect to the internet. Onyi et al. (2018) developed a formalized form of online learning that is particularly well suited for the twenty-first century because it did not necessitate actual contact between students and instructors. Individuals can study at their own pace, whether at home, at work, in their vehicles or taxis, on flights, or in any other location. They can also read materials online or download them to read at a later time.

The variety of approaches in which Information and Communication Technologies are used to support learning, teaching, and assessment, ranging from resource-based learning (the traditional methods in which students complete face-to-face tasks, supplemented by a variety of online resources) to project-based learning is known and referred to as e-learning. According to Ladipo (2012), an e-learning platform might be utilized to decongest student populations in schools and, as a result, eradicate all sorts of problems associated with the overpopulation of students in tertiary institutions and secondary schools. E-learning can take place at any time and is not restricted location-wise and can be done at the convenience of a student. The learning material may also include multimedia content to create a friendly environment and ease the understanding of the concepts, thereby creating an environment that encourages students to take an active approach to learning.

Electronic educational platforms gained popularity and continued to garner attention during and after the COVID-19 era, as both teachers and students from specialized schools made use of the platform. Covid-19 has prompted an increase in the usage of educational platform systems, allowing students to continue their formal education while also conducting research. Cloud-based learning platforms such as Canvas online learning, Microsoft team, and Google classroom have created a more concentrated environment where one can easily advance their knowledge and even learn new skills.

Online learning and teaching are made possible through the use of Canvas, which is a course administration system. It enables teachers to communicate with their pupils about grades, information, and assignments. Offering discussion boards for asynchronous discussion, chat rooms for real-time debate, and other resources are provided by the Canvas online learning platform, among other things (Dupaye, 2020). Efforts to keep the education system afloat continue. The Microsoft team was a valuable tool or digital hub that brought chats, content, assignments, and apps all in one location. It lets teachers communicate with students more quickly, share files and websites, distribute and grade assignments, and do so much more quickly than they could without it.

Another cloud-based tool that was used during the COVID-19 conference was Google Classroom. There are no costs associated with using this service, which allows teachers to publish assignments and videos, store class materials, and share files with students. Students complete their assignments and provide timely comments on their assessments. This gave students who didn't know much about information and communication technology (ICT) a chance to learn more and improve their learning habits.

According to Mukhatar, Javed, and Cethi (2020), cloud-based learning is online learning that takes place on the cloud, which is a virtual area, with the user interacting with it through a mobile app or browser, and the data processing taking place on a remote server base. Some of the advantages of cloud-based learning, according to him, include the fact that it is a very safe option for storing data, including learning materials that students and educators can access their course materials if the institution's electronic learning system crashes. It can also be used for backing up data. A carefully considered pedagogy is essential in enabling students to learn more effectively and can help them develop high order thinking skills.

Pedagogy is the art of instructing others. Some pedagogical skills can be learned, while others might be derived from the nature or way of life of a particular instructor. At the wake of COVID-19 while schools were closed, the cloud-based teaching was adopted by most educational institutions. Aguokogbuo (2000), defines pedagogy skills as "positive behavior or methods adopted by teachers to enhance learning." According to Nwaorgu (2009), pedagogical skills are the devices, or rather techniques, that a teacher uses to deliver instructions in class. Some of the pedagogical approaches used for students' adjustment during the COVID-19, were Canvas online learning, Microsoft team, and Google classroom. These platforms enhance the teaching and learning processes (Blair 2015).

It is a fact that Covid-19 pandemic put everyone around the world into a state of serious confusion and stagnation. It crippled economic, social and educational activities as everything was on a stand-still. Schools were not prepared for the kind of challenge that the pandemic posed as most of schools in Nigeria and developing nations were yet to fully incorporate ICT into teaching and learning processes. The pandemic exposed the need for schools to adopt advance technology including hardware and software to enhance and continue teaching and learning activities (Dhawan, 2020).

Furthermore, Mukhatar, Javed, and Cethi (2020) noted that the prevalence of COVID-19 pandemic and the consequent closure of institutions of learning, necessitated the development of online learning environments in order to ensure that learning was not disrupted. Cloud-based learning approaches were implemented to assist with the teaching and learning process. It is against this background that this study sought to examine leveraging cloud based pedagogical approaches as a pre-requisite for continuing teaching and learning activities in covid-19. Specifically, the study sought to:

1. Determine the extent to which canvas online learning platform as a pedagogical approach promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State.
2. Ascertain the extent to which Microsoft team as a pedagogical approach promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State.
3. Find out the extent to which Google classroom as a pedagogical promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State.

RESEARCH QUESTIONS

The following research questions were formulated to guide the conduct of the study:

1. To what extent does canvas online learning platform as a pedagogical promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State?
2. To what extent does Microsoft team as a pedagogical approach promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State?
4. To what extent do Google classroom as a pedagogical approach promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State?

METHODOLOGY

The study adopted descriptive survey research design. The study was carried out in Rivers State, Nigeria. The study was delimited to government senior secondary schools in Obio/Akpor Local Government Area. The population of the study was 6,250 (5000 students and 1,250 teachers) in the 20 public senior secondary schools Obio/Akpor Local Government Area of Rivers State. There were 399 participants in the study, with 159 teachers and 240 pupils making up the sample. The Taro Yamane formular was used to estimate the appropriate sample size for this study. The basic random sampling technique was used to select 8 teachers from each of the 20 schools, for a total of 159 teachers, and 12 students from each of the 20 schools, for a total of 240 students who were randomly selected from each of the 20 schools. The instrument for data collection was a researcher designed questionnaire titled "Leveraging Cloud-Based Pedagogy Questionnaire (LCBPQ). Responses to the items of the questionnaire were structured on a 4-point rating scale of a Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). It was confirmed by two measurement and evaluation professionals from Rivers State University, Port Harcourt, who worked together on the project. The experts evaluated the instrument based on its content, suitability of language, and appropriateness for the intended audience. It was necessary to include their changes and improvements prior to the instrument's distribution. The instrument's reliability was established using the test re-test method, and a reliability co-efficient of 0.76 was found, indicating that the instrument was dependable. A total of 170 copies of the questionnaire were distributed, with all of them being fully completed and returned. The data collected was used for analysis. The mean and standard deviation were used to analyse the data collected.

RESULTS

Research questions 1: To what extent does canvas online learning platform as pedagogical approach promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State?

Table 1: **Mean and standard Deviation Responses on extent of using Canvas as a Pedagogical approach in promoting continuous learning in public senior secondary schools in COVID-19 era in Obio/Akpor LGA R/S**

S/N	ITEMS	SA	A	D	SD	NO	$\overline{\text{X}}$	STD	REMARKS
1	I think canvas online learning can replace the students-centred learning	67 (268)	40 (120)	36 (72)	27 (27)	170	2.86	0.75	HE
2	Using canvas learning is a very difficult task for me in terms of learning	33 (33)	66 (132)	42 (126)	29 (116)	170	2.39	0.71	LE
3	I feel comfortable asking questions during learning via canvas	80 (320)	32 (96)	12 (24)	46 (46)	170	2.86	1.00	HE
4	Understanding in a canvas class is a major problem.	98 (382)	52 (156)	7 (14)	13 (13)	170	3.38	0.90	HE
5	I think canvas learning should be inculcated in the teaching/learning process	28 (28)	41 (82)	59 (177)	42 (168)	170	2.68	0.73	HE

6	Use of canvas on line learning on line learning is so expensive	99 (396)	30 (90)	15 (30)	26 (26)	170	3.19	0.85	HE
7	All through the COVID-19 period I used canvas in learning.	14 (14)	75 (150)	34 (102)	47 (188)	170	2.67	0.79	HE
8	Canvas learning collaborate learning among teachers and students	72 (288)	36 (108)	55 (110)	7 (7)	170	3.02	0.78	HE
9	Canvas learning discussion simplifies learning	80 (320)	50 (150)	20 (40)	20 (20)	170	3.12	0.81	HE
10	I feel so excited when it comes to learning via Canvas	65 (260)	75 (225)	30 (60)	0 (0)	170	3.21	0.83	HE
	Grand Mean						**2.94**	**0.82**	**HE**

Field Survey, (2022).

From table 1, a grand mean score of 2.94 was gotten with a standard deviation of 0.82, the grand mean score is greater than the criterion mean value of 2.50 is accepted, and can be concluded that canvas learning has a positive effect on teaching/learning process among senior secondary school students.

Research questions 2: To what extent does Microsoft team as a pedagogical promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State?

Table 2: Mean and standard Deviation Responses on extent of using Microsoft Team as a Pedagogical approach in promoting continuous learning in public senior secondary schools in COVID-19 era in Obio/Akpor LGA R/S

S/N	ITEMS	SA	A	D	SD	NO	$\overline{\text{X}}$	STD	REMARKS
1	I used Microsoft team effectively.	16 (16)	45 (90)	21 (63)	88 (353)	170	3.06	0.79	HE
2	Use of Microsoft team is not expensive.	79 (316)	46 (138)	21 (42)	24 (24)	170	3.06	0.79	HE
3	I never had time for Microsoft class	15 (15)	44 (88)	23 (69)	88 (352)	170	3.08	0.89	HE
4	I feel so uncomfortable using Microsoft team	87 (348)	20 (60)	34 (68)	29 (29)	170	2.97	0.77	HE
5	Asking question during class was a team of concern	78 (312)	56 (168)	12 (24)	24 (24)	170	3.11	0.80	HE
6	I think that the use of Microsoft team is for the rich	20 (20)	19 (38)	53 (159)	78 (312)	170	3.11	0.80	HE
7	I am not use to computer, so it was difficult sign in for class	76 (304)	85 (255)	6 (12)	3 (3)	170	3.38	0.89	HE
8	In Microsoft class lateness to class was not a barrier.	45 (180)	35 (105)	59 (118)	31 (31)	170	2.55	0.71	HE
9	Microsoft team enhances online visibility	0	23 (46)	67 (201)	80 (320)	170	3.34	0.89	HE
10	Students were informed about classes to be taught via Microsoft	59 (236)	82 (246)	16 (32)	13 (13)	170	3.10	0.80	HE
	Grand Mean						**3.08**	**0.72**	**HE**

Field Survey, (2022)

Table 2 above gave a grand mean of 3.08 and a standard deviation of 0.72 which is greater than the criterion mean of 2.50. This implies that Microsoft team pedagogical approach played useful role in the teaching/learning process among Senior secondary school students in the Covid-19 era.

Research question 3: To what extent does Google Classroom as a pedagogical approach promote continuous teaching and learning activities during covid-19 era in public senior secondary schools in Obio/Akpor Local Government Area of Rivers State?

Table 3: Mean and standard Deviation Responses on extent of using Google Classroom as a Pedagogical approach in promoting continuous learning in public senior secondary schools in COVID-19 era in Obio/Akpor LGA R/S

S/N	ITEMS	SA	A	D	SD	NO	$\overline{\text{X}}$	STD	REMARKS
1	I feel uncomfortable using goggle class room	55 (23.2)	33 (99)	15 (30)	64 (64)	170	2.50	0.71	HE
2	Goggle classroom is a pedagogical approach that should not been used in teaching/learning process	30 (30)	46 (42)	24 (72)	70 (70)	170	1.55	0.93	LE
3	I never used Google classroom because I don't know how to use it.	12 (12)	77 (154)	18 (54)	63 (63)	170	1.66	0.88	LE
4	The use of Google classroom was not a problem to me.	14 (14)	17 (34)	62 (186)	77 (77)	170	1.83	0.83	LE
5	Could not send completed assignment via Google class	120 (480)	11 (33)	10 (20)	29 (29)	170	3.31	0.88	HE
6	The use of Google Classroom in solving problem is an easy task.	85 (337)	70 (210)	5 (10)	10 (10)	170	3.35	0.90	HE
7	I recognize all the icons in the google classroom and use it effectively.	83 (332)	72 (216)	10 (20)	5 (5)	170	3.37	0.89	HE
8	Google classroom give room to personal evaluation	80 (320)	77 (154)	6 (18)	7 (7)	170	1.51	0.94	LE
9	I was better informed in the used of Goggle classroom	96 (384)	42 (126)	10 (20)	22 (22)	170	3.25	0.85	HE
10	I was active in the use of Goggle classroom.	16 (16)	20 (40)	30 (90)	102 (102)	170	1.46	0.95	VLE
	Grand Mean						**2.38**	**0.88**	**LE**

Field Survey, (2022).

In table 3 above, the grand mean score was given as 2.38 with a standard deviation of 0.88 which gave a remark of very low extent as the mean score was less than the criterion means value 2.50. Thus, it is obvious that students of Senior secondary school did not practice Google classroom as a pedagogical approach in teaching/learning process.

DISCUSSION OF FINDINGS
The findings of the study in research question 1 suggested that canvas online learning was a useful pedagogical strategy among Senior Secondary students in the teaching learning process during the Covid-19, as demonstrated by the results of the study in research question 2. It is in accordance with Islam (2020), who opined that E-learning necessitates the use of tools for instruction in teaching and learning in order to be effective, and that some of the e-

learning tools include canvas, social book marking, instant messaging, and some other online forums. It has long been recognized that canvas tools improve both the effectiveness of teaching and the learning experience of pupils. As demonstrated in Uguanyi (2019), this platform saves time and lets students to concentrate on other objectives. Students are always aware of their standing in a subject because the Grade book in canvas is always available (2019). Researchers found that Microsoft team learning was extremely beneficial in the learning process for senior secondary school students during the Covid-19 era, according to the findings of research question 2. This study agrees with Greg (2020), who stated that the Microsoft team provides secondary school pupils with the greatest amount of convenience and flexibility possible while they are learning. It has been said by Dupaye (2020) that the Microsoft team software application is a video collaboration tool that allows for real-time connection interaction and may be used for in-class instruction and learning. This research also revealed that class discussion, assignments, and submission of instructions can be done more comfortably using Microsoft team than even one-on-one office hours meetings, and that students had more time to view charts, subject pictures, and also share assignments with teachers as a result of the findings.

Finally, the results of the research question 3 revealed that Senior secondary students did not use Google Classroom as a pedagogical strategy in the teaching/learning process, as found in the study. This study does not correspond to the findings of Uguanyi's (2019) study, which found that Google Classroom saves time and paper while making it simple to arrange lessons, distribute assignments, communicate, and maintain attention. Unlike the traditional classroom, Dhawan (2020) supported the fact that Google Classroom provides assistance online and that students spend more time with their teachers than they would in the traditional classroom. The study does not recognize the Google Classroom as a critical pedagogical technique for senior secondary students in public schools in Obio/Akpor LGA, Rivers State, Nigeria and instead considers it to be less useful to their learning.

CONCLUSION

The use of cloud-based software as a pedagogical approach in Human adjustment in the Covid-19 era played important roles. E-learning with a combination of canvas learning: Microsoft team and google classroom is one that allows an individual to share screen or specific application to others screen. However, the canvas, Microsoft team learning was used as a pedagogical approach that cancel the draw backs of the physical environment. The e-learning also inculcate new pedagogical techniques into the traditional forms of education and makes learning more personalized and convenient.

RECOMMENDATIONS

Based on the findings of the study, the researcher made the following recommendations:
1.   Canvas learning should be used by secondary school student in learning, submission of class work and assignment and this method should be used by schools in teaching/learning process.
2.   Microsoft team should be adopted by the students in learning and the application should be made available by Government to senior secondary school students which will enhance the student e-learning skills.
3.   Google classroom should be fully introduced and made compulsory to all student as a method of learning. A subject in online google class should be introduced along site an on-line lab where student will have the opportunity to learn this pedagogical approach.

REFERENCES

Aguokogbuo, E.N. (2000). *Curriculum development and implementation*. Port Harcourt: Gabss Press Ltd

Bair L.O. (2015) *Teacher perceptions of pupils in teaching and learning*. New York David Mackay

CDC (2020). Pro. Cord Condition Centres for disease and prevention retrieved 17 November 2021

Dhawan, S. (2020). Online learning: A panacea in the time of covid-19 crises. https://journals.sage pub.com.

Dupaye, I. (2020). *Learning technologies: An introduction to hybrid teaching*. Chicago: Cambridge Press.

Islam M.A. (2020). Prevalence of Headache in patients with corona virus Disease 2019. (Covid 19: A systematic reviews and meta-analysis) Retrieved from https://ncdc.org/covid-19.info.12367//

Itrastinski S. (2008). Asynchronous and synchronous e learning in htth//bnrc.spring eropen.com Retrieved 5-02-2022

Ladipo, K. Margret's, Oyeymka I. Kolawola, Yekiti N Arafe (2021) *Proceeding of the world congress on Engineering and computer science.* Francisco: Macmillan Publishers

Muchtar, K., Javed, A. & Cethi, H. (2020). Advantages, limitations and recommendation for online learning during covid-19 pandemic era. *Parkistan Journal of Medical Sciences, 7*(3), 21-30.

Onunkwo.G. I.N. (2002*). Fundamental of Educational Measurement & Evaluation*. Owerri: Cap Publishers International

Hinshaw, D. & Mckay, B. (2021) in Hunt for covid-19 origin, Patient zero point to second Wuhan market. The man with the First confirm Infection of the new corona virus. W*all Street Journal* retrieved 27 February 2021.

Uguanyi, F.C. (2019). Information and Communication Technology Literacy among academic librarians in Enugu State. *International Journal of Information and Communication Technology*.2(3) 44-51

WHO (n.d). *Coronavirus disease (COVID-19).* Retrieved online from https://www.who.int/health-topics/coronavirus#tab=tab_1 on 1st January, 2022