

## Analysis of Post Covid-19 Era Implementation of E-Learning Techniques Adopted to Teach Polytechnic Students during Lockdown

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### ABSTRACT

In order to contain the spread of COVID-19 among the citizens, the Federal Government of Nigeria closed down all levels of schools (from primary to tertiary institutions) and implemented a lockdown which prevented movement of people from one place to another. They encouraged schools to utilize online techniques to teach their students. The management of Federal Polytechnic, Oko, opened a portal where lecturers were directed to send their materials to enable students study and participate in course discussion. To further complement the efforts of the management, the research involved establishing WhatsApp groups for Higher National Diploma (HND1) students of Computer Science and Public Administration who offer Operating System 1 (Com 311) and Advanced Computer Packages (Com 325) respectively. The purpose of the study was to examine the effectiveness and challenges of the e-learning techniques adopted during COVID-19 lockdown period. The study further examined the adaptation of the techniques to teaching students in post lockdown era. The study which is qualitative adopted focus groups and interview method. The period of the study was April 20, 2020 to May 20, 2020. The study discovered that some students did not participate in the online classes. Some of the students who started the online classes did not complete the classes by not doing all the assignments given at the end of the classes. The interview method through phone calls was used to find out from the students involved the reason why they did not participate in the online classes. Also the method was used to find out from those who started the online classes but suddenly stopped the reason why they did so. The results show that e-learning techniques that were adopted during COVID-19 lockdown period was effective in teaching students. The challenges identified in the process adopted for teaching students using the e-learning techniques include (a) some students did not have smartphones or laptops, (b) there was lack of access to data, (c) lack of access to the internet, and (d) inability of the students to repair smartphones during the lockdown period. The study recommends that hybrid learning that mixes in-person learning with e-learning is appropriate in the post COVID-19 era for further delivery of knowledge to students. The study further suggests that the students should be made to be aware that they will engage in hybrid learning that involves in-learning and use of technological devices at the time of their registration in the school.

Keywords: COVID-19, e-learning, lockdown, portal and WhatsApp.

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### INTRODUCTION

Coronavirus Disease 2019 (COVID 19) is a highly transmittable and pathogenic viral infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which emerged in Wuhan, China and spread around the world [1]. The symptoms of the sickness include cough, fever, sore throat, recent loss of taste or smell, difficulty in breathing/shortness of breath, diarrhoea/abdominal pain, runny nose/catarrh, and fatigue [2]. In order to curtail the spread of the virus, China

responded quickly by establishing isolation centres, closing down offices, schools, markets, places of worship, relaxation centres, and transportation channels. They implemented a lockdown that prevented people from moving from one place to another. The only sets of people that were allowed to move around were medical personnel, law enforcement agents and those dealing on food items. World Health Organization (W.H.O) observed the success rate recorded by China and

encouraged other countries to adopt the Chinese model in handling their peculiar COVID 19 problems [3]. The Chinese model also includes washing of hands with soaps or hand sanitizer regularly, drying the hands, and maintaining social distance.

In line with WHO suggestion, the Federal Government of Nigeria (FGN) implemented a lockdown and directed her citizens to adopt the Chinese model as approved by WHO. The lockdown includes the closing down of primary, secondary and tertiary institutions. A week after the lockdown, on 21<sup>st</sup> March 2020, the Minister for Education, Mallam Adamu Adamu directed teachers in primary and secondary schools to commence online teaching [4, 5]. Different schools adopted different

techniques for the online teaching. These include Edmodo, google classroom, Microsoft team, web portal, WhatsApp, Telegram, Screen cast and presentation packages [6, 7, 8]. The Federal Polytechnic, Oko, adopted a web portal model. The model involved lecturers forwarding their lecture contents to dedicated content handlers who upload the lecture contents to the portal. Students can access the portal, download the contents, and learn from it. Some lecturers utilized one or two methods to complement the use of portals in teaching students. This study therefore examined the e-learning techniques adopted to teach students during the COVID-19 lockdown and the adaptation of the techniques to teach students in post COVID 19 period.

#### **RESEARCH QUESTIONS**

1. What are the e-learning techniques adopted to teach students during the COVID-19 lockdown period?
2. Can the techniques be adapted to teach students in Post COVID-19 lockdown era?

#### **PURPOSE**

The purpose of study was to examine the e-learning techniques adopted to teach students during the COVID-19

lockdown and how the techniques can be adapted to teach students in post COVID 19 period.

#### **RESEARCH METHODOLOGY**

The study which is qualitative adopted focus groups and interview method. The period of the study was April 20, 2020 to May 20, 2020. The study involved students of Federal Polytechnic, Oko, who offer Operating System 1 (Com 311) and those offer Advanced Computer Packages (Com 325). The courses were first semester courses. Students who offer Com 311 were 309 while those who offer Com 325 were 506. The study

made use of WhatsApp platform to teach the students. Because the students were large in number, and the maximum number per class that WhatsApp can accommodate is 200, the students were divided into classes. Whereas the students for Com 311 were divided into two classes, those for Com 325 were divided into three classes. Each class was allotted thirty minutes. The lecturer period was between 12noon to 2pm.

#### **LITERATURE REVIEW**

##### **Teaching methods and learning**

Teaching methods include all the techniques that a teacher uses in order to achieve expected learning by students. For a particular technique to be appropriate, the type of learner, the learning style and the desired learning are to be put into consideration. [8], is of the opinion that how students learn should be of uttermost consideration while selecting and implementing format and technique to be adopted for teaching. It is also important to ensure that the format to be adopted is well

defined with detailed procedure for implementation [10]. The technique to be selected also should be implementable and should be able to generate result at the end. Good teaching plans encourage creativity among students.

Teaching methods according to [12] can broadly be grouped into two - teacher based and student based. In teacher based method, teachers are the major authority in the scheme [9,10]. The basic function of a teacher is to transmit

information and knowledge to students whose main role is to receive and assimilate the knowledge. Teachers prepare their lectures and deliver the lectures in styles and formats that are suitable for students' comprehension [11, 12]. However, students can ask questions. At the end, there are assignments and tests to examine students.

The student-based method is a model which establishes that teachers are the authority figure but it integrates the teacher and students in the learning process. The major task of teachers in the model is to help students to learn and comprehend the materials. Students' comprehension is however assessed by using different methods of classroom evaluation such as assignments, group works, home works and class activities. In such setting, teaching and assessments are linked together and they are continuously done during classroom contacts [13, 14].

Modern teaching techniques according to [6] however combine the different methods in order to achieve a more fruitful result of imparting knowledge to students. [6], also stated that there are different types of teaching methods: direct instruction, inquiry based learning and cooperative learning. Direct instruction is a teacher centred approach. It is traditional teaching technique that involves lecture and demonstration. Inquiry-based learning and cooperative learning are student centred. Inquiry-based learning involves students carrying out investigation and hands-on learning while cooperating learning involves group work and peer learning [7].

Lecture involves a teacher presenting information to students orally. In the lecture method, the teacher explains everything while the students listen. The lecture method is ideal for students who do not have adequate background knowledge on a topic to be discussed. It is a format that is appropriate for presenting organized body of new findings to students. Lecture method should be planned in such a way that there should be questions and answer periods where students would have opportunity to make contributions. It is acceptable for higher education because of the large number of students

involved [8]. Lecture involves planning of presentation for easy comprehension and assimilation. Good lecturing would ensure that message is retained, the audience stays awake and the lecture receives appositive spark. When a speaker brings vitality and enthusiasm to a lecture, students remain attentive and will likely benefit from the presentation. Meaningful organization of lecture delivery is very important. Analogies linking known concepts to new ones are very helpful). In lecture, [9], suggests that it is good to use multimedia to help reach and engage students. [12], is of the opinion that bringing in many new findings would be much load for students which will make them not to retain much. [10], suggests that getting effective lecture delivery and class participation involve a planning of the lecture body, providing examples, summarizing periodically and checking for understanding.

Demonstration is also a teacher centred learning approach. It involves the use of examples, diagrams or experiments to teach students. It establishes a connection between visual concepts and relative reasoning. Using demonstration enables students to retain and recall what they have learnt relating to real life examples. This is because good demonstrations use real life examples and their applications during contacts. This enables students to easily grasp and comprehend the subject of discussion. [14], posits that students are set up to potentially conceptualize class material more effectively using demonstration.

Instruction based learning is students based learning. It involves students developing questions on their own, making observations and obtaining supporting evidence to answer the questions. It also requires students to do research on their own to discover existing knowledge on a topic. This will enable the student to develop methods to carry out experimentation and the instruments that would enable him gather information. It would also enable students to outline possible explanations to their concepts and lay foundation for future study.

Cooperating learning is student centred learning which requires students coming together to re-assess their knowledge by

sharing ideas. A good example of cooperative learning is discussion. Discussion enable students to exchange ideas, talk to one another, and analyze other fellow student's point of view. It enables students to share their ideas, experiences and attitudes. Discussion also allows teachers to listen while students interact. This will enable the teacher to properly guide the students. A good teaching method in higher institutions would involve a

### **E-learning**

E-learning is the method used to access education using digital devices. There are different conceptual perspectives on e-learning. For instance, e-learning is seen as a tool for raising the rural areas, being a cheaper and more flexible alternative [7]. [13] sees e-learning as being important to governments of developing countries that are struggling to meet a growing demand for education while facing an escalating shortage of teachers.

E-learning can be classified into synchronous and asynchronous. Synchronous e-learning works in real-time and resembles a virtual classroom that allows learners to questions, teachers to respond and classify immediately through instant messaging (chat), teleconferencing and videoconferencing. Learners can interact with fellow students and lecturers during the program. Asynchronous e-learning involves coursework delivered via the web, email, weblogs, threaded

combination of these methods. Lecture method is ideal because of the higher institution setting. Most often it involves large number of students. Demonstration is important as it helps students to comprehend and assimilate what they have learnt relating it real world examples while discussion helps students to interact and analyze various aspects of a topic. It also helps a teacher to assess a student understanding of a topic [5].

discussion and forums. Learners follow the programme at their own pace employing the internet merely as a medium of support [7].

E-learning therefore offers the ability to share materials in all kinds of formats such as videos, slideshows, word documents, PDFs, conducting webinars and communicating with teachers via chats and message forms. It helps teacher-student interaction. It also reduces time taken to access information by offering access to online resources, databases, periodicals, journals and digital library. It enables students to have online discussion with other students on a platform, gather knowledge from people who discuss their experiences on how they overcome their challenges. There are expert systems on any topic which will guide and assist a student in solving a problem.

### **RESULTS**

Students who offer Com 311 were 309 while those who offer Com 325 were 506. A total of 298 students participated in the online classes for Com 311 giving a percentage of 96 while a total of 445 participated in the online classes for Com 325 giving a percentage of 87. A total of 11 students for Com 311 and a total of 61 students did not participate in the online classes. As the online class commenced, it was discovered that out of the 298 students that started the online lecture, at the end of the class, only 291 students took Com 311 assignment. Also, out of the 445 students that commenced lecture for Com 325, only 440 students took the final assignment. That shows that 7 persons did not complete the online class in Com 311 while 5 persons did

not complete the online class in Com 325. The interview method through phone calls was used to find out from the students the reason why they did not complete the online lectures. Also, the interview method was used to find out from those students who did not participate in the study at all, why they did not participate. The results show that the reason why students did not participate in the online classes include (i). 22 out of the 72 students said that they do not have a smartphone; (ii). 11 out of the 72 said that they have smartphone but their phones have problem and need to be repaired and there was no place to repair the phones at that moment; (iii). 34 out of the 72 said that they cannot access network where they lived, therefore they are not

aware of the programme; (iv). 5 out of the 72 said that they have smartphone but they do not have money to buy data

as their sponsors complained that they don't have money.

## DISCUSSION

Effectiveness of e-learning techniques adopted during COVID-19 lockdown period

To be able to measure the effectiveness of e-learning techniques, [7], inferred that the first step to take is to identify the motive behind the e-learning exercise. He identified three motives for e-learning, which are: i. improving skills; ii. acquiring certain knowledge, and iii. Modifying behaviour and attitudes.

According to [9], the Bill and Melinda Gates Foundation project suggests that using multiple measures to evaluate teacher's performance which include classroom observation based on video-taped lessons, students' surveys of their instructional material, and measure of student's growth on validated assessment identified processes for measuring the effectiveness of online learning to include (i) observing the employees involved in the learning before the learning commenced and after the training period; (ii) creating a scenario-based tests that allow employees to show how to apply what they have learned; (iii).use of performance goals which involved the use of assignments that simulate real life examples to test the employees, and the use of interviews and integrated questions; (iv) use of assessment or quizzes.

Dr. Donald Kirkpatrick's renowned model for evaluation of e-learning include a four level approach which are level 1 (reaction), level 2 (learning), level 3 (behaviour) and level 4 (results). The measures for reaction include face-to-

face interview, printed surveys and questionnaire and online polls and feedback, for learning it is written examination, online tests and quizzes, and real or simulated tasks, for behaviour it is printed or online self-assessment questions and interviews with supervisors and colleagues, while for results it is to check the output based on lower costs, improved quality, time reduction and higher income [11].

To measure the effectiveness of the e-learning techniques used during the lockdown, multiple measures were adopted. Students contributions to topics of discussion were observed. Scenario based tests that represented real life situations were used. For instance, to teach students how computer virus attacks operating systems, the students were asked if they have heard of Human Imuno Deficiency Virus (HIV), which they answered yes. They were asked if they know how HIV operates, few students said yes. Then, they were told that HIV attacks human cells that helps human beings to build defences against micro-organisms attacks. That as the HIV continues to attack cells, the defences weakens and any sickness can kill the person. In the same way, if the computer virus attacks the operating systems, applications cannot be loaded, and the system will be rendered useless as there will be no software to manage the resources in the system. Also, performance goal was used by giving the students online quizzes and assignments which they effectively responded to.

### Challenges of e-learning techniques adopted during lockdown period

The two major media platforms adopted to teach students during the COVID-19 lockdown period were the school portal, and WhatsApp platform. The researcher forwarded his materials to the school portal for the students to access and utilized WhatsApp for further teaching of students.

The challenges observed by using WhatsApp are:

1. The maximum number of students that can be registered

per class is 200. Therefore, the researcher had to create additional classes to accommodate all the students.

2. Internet access stability became a problem. Most times, the network may be bad such that the teacher will ask a question but it will take students sometime before they respond.

## **Adaptation of e-learning techniques adopted during lockdown to post lockdown period**

The COVID-19 lockdown era shows that students can be taught through media platforms that is outside the normal classroom. There are many platforms that can be adapted to teach students

outside the normal classroom periods when the students are in school. Some of these platforms include are:

### **i. Screencast and presentation packages**

Screen cast is a digital recording of computer screen output, also known as video screen capture often containing

audio narration. It can be used with presentation packages such as Microsoft PowerPoint.

### **ii. Telegram**

Telegram is a cloud-based instant messaging, video telephony and voice over internet protocol (VOIP) service with end-to-end encryption for secret

chat only, whereas cloud chat use server/server-client encryption and its messages are stored encrypted in the telegram cloud.

### **iii. Google classroom**

Google classroom is a free web service developed by Google for schools that aims to simplify creating, distributing and grading assignments. The purpose

of the Google classroom is to streamline the process of sharing files between teachers and students.

### **iv. Microsoft team**

Microsoft teams is a hub for teamwork which brings together everything a team needs. Chats and threaded conversations, meetings and

videoconferencing, are handled efficiently.

### **v. Zoom**

Zoom is a cloud based service which offers meetings and webinars, and provides content sharing and video conferencing capability. It offers videos,

audios and screen sharing experience across a wide range of devices and platforms.

## **CONCLUSION**

The study examined the effectiveness and challenges of e-learning techniques adopted during the COVID-19 lockdown. It was discovered that the WhatsApp e-learning platform that was used in teaching the students during the COVID-19 lockdown was effective in the students' learning. The study identified the challenges to the use of e-learning platform in teaching students to include some of the students not having laptops or smartphones, inability of the students to repair their smartphones, inability of the students to recharge their data, and inability of the students to access to internet.

in Post lockdown era. The study observed that the e-learning techniques that were adopted during the COVID-19 lockdown period can be adapted to post COVID-19 post lockdown era in a format that is known as hybrid teaching. This involve in-person teaching during lecture period that involve lecturers and students being physically present in the classroom for interaction and learning purposes. Then during off-lecture period, the lecturer can use any of the e-learning methods to teach students. Also, when a lecturer travels for an official assignment, he can have contact with his students using any of the e-learning methods.

The study also examined the adaptation of the techniques to teaching students

## **RECOMMENDATIONS**

The study recommends the following to the management of Federal Polytechnic, Oko:

1. Parents or guardians should be encouraged to provide smartphone or laptop for their wards during the period they are

- registering as new students in the school.
2. There is a need for free access to the Internet within the school premises so that lecturers can prepare their lectures and send it online and students can access the material. A lecturer who is on an official assignment can deliver his lecture from anywhere using e-learning platform.
  3. Parents or guardians should be encouraged to provide data for

their wards to enable them have access to network during off lecture periods.

4. Students should be informed during their registration and orientation that they will engage in hybrid studies that involves in-person learning and e-learning for them to be aware of the learning formats they are expected to use on time.

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