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EFFECT OF MIGRATING TO THE E-LEARNING PLATFORMS ON THE DELIVERY OF HIGHER EDUCATION IN TERTIARY INSTITUTIONS IN NIGERIA IN THE COVID-19 PANDEMIC ERA

BY

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ABSTRACT

This study examined the effect of migrating to the e-Learning platforms on the delivery of higher education in tertiary institutions in Nigeria in the COVID-19 pandemic era. The objectives of the study centred on finding out the effects of the online learning, mobile learning, and e-learning platforms on the performance of lecturers, students, and non-academic staff in the teaching and learning of courses in tertiary institutions in Nigeria respectively in the COVID-19 pandemic era. The methodology adopted by the study comprised quantitative research method and sample survey research design. In the sample survey research, a well validated and pre-tested questionnaire was used in collecting data. Results of the reliability tests performed on the questionnaire showed a Cronbach's Alpa index of 0.823. The population for the study was 2,653, representing the total staff and students' strength of the five sample units selected for the study. These sample units were the UNN, ESUT, Enugu, IMT, Enugu, Enugu State College of Education (Technical), Enugu, and Godfrey Okoye University, Enugu. From this population, a sample size of 336 was determined using Kothari's Finite Population Correction Factor Statistics at 5% desired level of precision and confidence level of 95%. Stratified random sampling was used in the selection of respondents to this study. Descriptive statistics consisting of frequency counts, tables, and percentages was used in analyzing the data collected. Multiple Regression Analysis at probability (p) less than 5% ($p < 0.05$). It was the findings of the study that the online learning platform had no significant effect on the performance of lecturers in the COVID-19 pandemic era; that the mobile learning platform did not increase the performance of students in the COVID-19 pandemic era; and that e-learning platforms never accounted for any change in the performance of non-academic e-learning facilitators/staff in the COVID-19 pandemic era in tertiary institutions in Enugu State. Finally, the study recommended increase in the funding of higher education institutions, reduction in the cost of ICTs through tax incentives to importers of ICTs accessories and establishment of local ICTs industries, training and capacity building of staff of HEIs in Nigeria among others.

Keywords: e-learning platforms, COVID-19 pandemic, ICTs, HEIs, Nigeria.

1. Introduction

The first case of COVID-19 was reported in Nigeria by the Federal Ministry of Health on 27th February, 2020. This was the case of an Italian who works in Nigeria and returned from Milan, Italy to Lagos, Nigeria on the 25th of February, 2020 (Maclean, 2020). Since then, the number of confirmed cases of infection kept rising both in Nigeria and across the globe. From the National Centre for Disease Control report, the affected people increased from 407 to 48,569 with 1,098 deaths from February to September 20, 2020 (Nigeria Centre for Disease Control, 2020). Findings from 200 countries in the mid-April 2020 showed that 94 percent of learners were affected by the pandemic around the world, which represents 1.58 billion learners (United Nations, 2020). Additionally, UNESCO (2020) reported that the closure of higher institutions has affected over 91 percent of the students' population in the world and that 23.8 million students may drop out or not be able to secure admission to schools in the 2021 academic calendar. From the global perspective, the COVID-19 pandemic has made the largest devastating impact on the education sector and affected learners and teachers from pre-primary to the tertiary education level (Andreas, 2020). Universities closed their premises and countries shut down their borders in response to lockdown measures.

As part of measures to contain the spread of COVID-19 in Nigeria, the Federal Ministry of Education, through the Permanent Secretary in the Ministry, on March 19th ordered the immediate closure of tertiary institutions, secondary and primary schools across the nation over the outbreak of the disease in the country. Report of Education in Emergency Working Group has also shown that about 46 million Nigerian students were affected by the schools' closure (EEWG, 2020); this is very significant as it represents 25 percent of Nigeria's total population. Worthy of note also is the fact that virtually all the high education institutions (HEIs) or tertiary institutions of learning (TILs) in Nigeria operate the traditional or conventional mode of learning known as the face-to-face (F2F) mode. This mode by its very nature requires high contact and interactions on the part of the student, his lecturers, and fellow students for the purpose of participating in the key activities of his academic programme, such as lectures, assignments, tests, examinations, practicals, projects, library research, seminars, workshops, and conferences, among others. This means, therefore, that throughout the period of the COVID-19 lockdown, all the aforementioned academic activities were disrupted or suspended in most HELs in Nigeria like in other countries of the world. In the efforts to mitigate the effects of the COVID-19 pandemic on the education system, many countries in both the developed and developing world resorted to the distance learning model that is based on the electronic learning (e-learning) format (Schleider & Reimers, 2020; Oyediran et al., 2020).

Nigeria on its own part followed suit, with the government compelling all public and private HELs to migrate to the e-learning model as part of the efforts to mitigate the effects of the COVID-19 pandemic lockdown on the Nigerian higher education system (The News, 2020; Oyediran et al., 2020; PTF on COVID-19, 2020). As investigations show, private universities are at the forefront of e-learning adoption in Nigeria as a result of their innovative and flexible operations. Regrettably, it appears that most public HEIs have not been able to embrace the e-learning platform to the detriment of their students and the society at large. Various factors might be responsible for these, such as student population, training of lecturers and students,

sustainable internet facilities amongst others. The aforementioned factors coupled with the university unions' incessant strikes play a key role for the setback of public HEIs' academic activities during the COVID-19 pandemic in Nigeria.

It is also instructive that one of the important academic programmes or courses being taught and learnt in almost all HEIs in Nigeria either as a major or an elective course is the almighty Public Administration. In Nigeria today, social studies is offered in many polytechnics, monotechnics, colleges, and universities for the award of certificates, diploma, Masters and even doctorate degrees.

The mission of this paper, therefore, is to examine the effect of migrating to the e-learning platforms on the performance of lecturers and students in the delivery of tertiary education in Nigeria in the era of COVID-19 pandemic currently ravaging Nigeria and the entire world. This study pursued the following specific objectives: to examine the effect of online learning platform on the performance of lecturers in tertiary institutions in the COVID-19 pandemic era: to find out the effect of mobile learning platform on the performance of students in tertiary institutions in the COVID-19 pandemic era; and to investigate the effect of e-learning platforms on the performance of non-academic e-learning facilitators/staff in tertiary institutions in the COVID-19 pandemic era.

2.0 Statement of the Problem

Electronic learning processes involve some digital technologies that permit teachers and students not to necessarily be present in the same room. It is the only mode of teaching that can be of help in passing instructions to students in a time like this that social distancing is of utmost importance (Karp & McGowan, 2020). Before the current COVID-19 crisis, digital technologies have also allowed us to move much of our lives such as health, education, social and economic life online (Miks & Mcilwaine, 2020). Online education has played a vital role in the past as it has helped some institutions to overcome the barrier of educational continuity in the time of global crisis (Ayebi-Arthur, 2017). For instance, it was online teaching that University of Camerino resorted to when earthquake destroyed almost all their infrastructure and face-to-face interactions were not possible (Ayebi-Arthur, 2017). Online education also helped University of Canterbury to operate when it was faced with a great earthquake in 201 (Todorova, & Bjom-Andersen, 2011). Recently, this disaster is in the form of COVID-19 which has made all schools, colleges, and universities to shut down so as to curb further spread of the virus. Many academic institutions, proprietors, State and Federal Governments are, therefore, seeking the help of online education so that teaching and learning processes are not further hampered. For instance, some state governments such as Lagos, Abia, Enugu, Ondo, Akwa Ibom, Nasarawa, Imo as well as Ekiti States in Nigeria proffered online-virtual education as the possible way out (Oluwatuyi et al., 2020). In general, a complete online education requires an elaborate lesson plan design, teaching materials such as audio and video contents, as well as technological support teams (Lucey, 2015).

In addition, some schools, especially private schools make use of some online applications to engage their students while the school doors were physically closed. There are several of such online tools available which are important for an effective and efficient learning environment. Educators can use a combination of audio, videos, and text to reach out to their students in order to maintain a human touch to their lectures (Zhang et al., 2006). This also helps in

creating a collaborative and interactive learning environment where students can give their immediate feedback, ask queries, and learn interestingly. In fact, remote learning became a lifeline for education during the pandemic but, the opportunities that digital technologies offer go well beyond a stopgap solution during a crisis (Andreas, 2020). According to Eze et al., (2018), e-learning education is the all-inclusive blending of ICT gadgets and modern telecommunication equipment into the education system. Andreas (2020) and Eze et al. (2018) maintained that e-learning is a hallmark of distance learning. Digital technology offers entirely new answers to the questions of what people learn, how they learn, and where and when they learn. Meanwhile, Eduard and Lucian (2020) hinted that e-learning is an innovative platform for transmitting knowledge and skills to the learners; it is cheap, saves time, and has a wider coverage, and as well promoting team learning and collaboration. Andreas (2020) reiterated that technology promotes deep learning, and allows schools to respond better to the varying needs of the students.

In a bid to avoid brain-drain and prevent the total collapse of the education sector in the country, Nigeria joined other leagues of developed countries and incorporate e-learning to deliver lectures and give assignments to the students, this digitization has not been sufficiently harnessed in many tertiary institutions where ICT is applied, and it is limited to students' registration and examination. Much effort has not been geared towards effective teaching and learning process and students' academic performance through e-learning. While COVID-19 has forced Nigeria to embrace e-learning to keep pace with rapid development in the area of technology, the implementation is at a very low pace (Oyediran et al., 2020).

In advanced countries, the changes are eminent in the educational sector as traditional teaching methods have been transformed into modern methods (Kacerauskas and Kusaityte, 2020). Students in the College routinely learned and studied with technology in advanced countries. For instance, the Chinese Ministry of Education introduced a *Suspending Classes Without Stopping Learning* policy to ensure that learning was not compromised at any time during the COVID-19 pandemic lockdown (Zhang et al., 2020), and provide flexible online learning to hundreds of millions of students from their homes (Huang et al., 2020). Online platforms were the most popular tool used during the COVID-19 pandemic in the OECD countries (Schleicher and Reimers, 2020). The instructional tools are designed in such a way that students could explore educational content at will while teachers delivered the lessons using virtual meeting platforms (Andreas, 2020). In Sweden, post-secondary schools have switched to mainly distance learning from the onset of the pandemic (UNESCO, 2020). In the online review conducted by Chaka (2020) in South Africa and the United States of America, it was found that during the COVID-19 lockdown, 17 of the 21 South African universities and 63 of the 64 U.S. universities migrated to e-learning and utilized Zoom, Canvas, and Blackboard as the topmost online tools and resources. In March 2020, the Italian government equipped schools with digital platforms, trained school instructors on techniques for e-learning, and gave digital devices to poor students to cushion the effects of the COVID-19 pandemic (The Republic of Italy, 2020). In the same March 2020, Pakistan's Higher Education Commission (HEC) compelled higher institutions to commence e-learning. Also, teachers in Greece conducted virtual real-time classes in conjunction with other online learning tools (Ministry of Education and Religious Affairs, 2020; Schleicher and Reimers, 2020). Australia rapidly switched to online learning in the wake of the pandemic (Ali, 2020). This would prevent compromising education in a pandemic situation (The News, 2020).

Going by the rapid rising cases of COVID-19 in Nigeria, the Federal Government locked down two states (Lagos and Ogun) where the index visited, and FCT Abuja while other affected states joined as the coronavirus spreads. Federal Ministry of Education enforces electronic learning in the tertiary institutions as a way to ensure the school system is not collapsed. Beyond the government pronouncement and swift shift to e-learning across the world, researchers have ot empirically examined the influence of socio-economic variables of instructors and constraints on e-learning compliance during the COVID-19 pandemic. More so the World Bank (2020b) is of the view that few pieces of research have been conducted on the scale of e-learning provision, compliance and limitations in the higher institutions. Many studies focused on necessity of e-learning during lockdown (Ali, 2020), instructional strategies for online (Mahmood, 2020), level of preparedness for e-learning (Eduard and Lucian, 2020; EiEWG, 2020), e-learning and tertiary education experience (Adeoye et al., 2020), and use of online instruction, tools and resources during COVID-19 (Chaka, 2020).

E-learning a technology-driven model and makes teaching take place without physical contact with the learners. The practical avenue to avoid drawback in the Nigerian education system during the COVID-19 is e-learning. E-learning supports knowledge and performance management (Mahmood, 2020; The World Bank, 2020a). According to Eduard and Lucian (2020), educational technology as a field of education or new terminology has been like teaching aids or apparatus. E-learning has offered tremendous opportunities for teaching by electronic means (Kacerauskas and Kusaityte, 2020; The World Bank, 2020a). Students that undertake electronic studies generally performed better than those in face-to-face courses (Andreas, 2020). To him, the academic performance of learners that used the electronic approach supersedes those who used the traditional approach. E-learning is a new learning model in Nigeria, with all its potentialities.

3.0 Review of Literature

3.1 Conceptual Framework

1. COVID-19 Pandemic

On January 30, 2020, the World Health Organization (WHO) announced that the COVID-19 outbreak had constituted a public health emergency of international concern (Mahase, 2020). The novel corona virus was initially named 2019-nCoV and officially as severe acute respiratory syndrome corona virus 2 (SARSCo V-2). As at February 26, 2020, COVID-19 has been recognized in 34 countries, with a total of 80,239 laboratory-confirmed cases and 2,700 deaths (WHO, 2020). Corona viruses are common in certain species of animals, such as cattle, camels and bats which can be transmitted to humans. Some health experts believe that the new strain of corona virus likely originated in bats or pangolins (Anthony et al., 2017). The virus has mostly spread through person-to-person contact. The most common way that this virus spreads is through close contact with already infected person. When people with COVID-19 breathe out or cough they expel tiny droplets that contain the virus. These droplets can enter the mouth or nose of someone with the virus, causing the spread of infection to occur (Parry, 2020).

On 11th March 2020, World Health Organization (WHO) declared COVID-19 a pandemic. A pandemic is a disease that has spread across a large region; for instance multiple continents or worldwide (Cucinotta & Vanelli; 2020). Since December 2019 it broke out in Wuhan, China till date, the COVID-19 pandemic has undergone three waves, leaving in its wake thousands

of persons across the world affected by way of death or containable infection (WHO, 2021). Up till date, no known cure against the dreaded disease has been found.

2. Electronic Learning (e-learning)

Electronic Learning often referred to as e-learning is a form of distance learning that enables one access his course materials, study guides, texts, assignments etc on computer, CD-ROMS, DVDs, computer-based applications etc (Oxbridge Academy, 2015). **e-Learning** in general can also be defined as the formal dissemination of instructional curriculum that is not dependent upon time or place via the use of multiple delivery options such as audio, video, and media communications and computer technologies (Levy and Mumame, 2004).

According to Wikipedia, e-learning refers to the use of electronic media and information and communication technology (lCT) in education. Broadly, e-learning includes all forms of educational technology in teaching and learning. E-learning is synonymous with multimedia learning, technology-enhanced learning, computer-based training, and computer-based instruction internet-based training, web-based training, virtual education, online education etc. It includes numerous types of media that deliver texts, audio, images, animation and streaming video and include technology applications and processes such as audio and video tapes, DVDs, CD-ROM and computer-based learning as well as local Intranet/extranet. E-learning is made up of online learning and mobile learning.

E-learning can occur inside or outside the classroom, it can be self-paced asynchronous learning or may be instructor-led, synchronous learning and is suited to distance learning and flexible learning but may be used in conjunction with face-to-face teaching, in which case the term blended learning is more appropriate.

The first instances of e-learning in the world took place in 1960 at the University of Illinois, USA, which created the first intranet system that enable student, access course materials and recorded lectures (Sarka, 2020). Globally, the advent of e-learning is arguably one of the most powerful tools available to addressing the needs of education (Ramon-Yusuf, 2001). The applicability of e-learning tools are a welcome development for purposes of enhancing access to people who hitherto would have been deprived of education by virtue of the distance of universities. For these people, the possibility of "virtual connections" to educational institutions opens new vistas and new possibilities for self-actualization. **E-learning** is becoming as popular as an alternative to conventional classroom-based education. Two major methods are usually applied in e-learning. These methods as earlier hinted are synchronous method, and asynchronous method (Lucey, 2015).

3. Online learning

Online learning is a form of e-learning that enables the learner to have access to his course materials, study guides, assignments etc. by means of the *Internet (World Wide Web).* Again, online learning as opposed to other types of distance learning is often more interactive than the former, as it allows the learner to communicate with his tutors, instructors, and fellow students. With online learning, one might also be able to download one's study materials from the Internet, submit assignments via online student portal, computer assessment online, attend Webinars, and participate in virtual classes (Oxbridge Academy, 2015). What then do the *Internet* and *Virtual classes mean*?

4. Internet

The Internet is a global network consisting of millions of computers and data bases, across the world. It is a network of many computer networks. The Internet has the ability to deliver multimedia materials and this quality makes it highly suitable for ODL. The educational uses of the Internet include e-mail, facsimile (Pax), file transfer, browsing and dissemination of educational/academic information e.g, conferences, newsgroups, chat room (messaging), institution/classroom home page, research activities, and e-learning-evaluation of students' performance.

The Internet or World Wide Web facilitates people in communicating and accessing remote information from global sources and, therefore, removes the constraints of time and distance. The World Wide Web (www) is a system of Internet servers that allows access to specially arranged documents formatted in hypertext mark-up language (Lucey, 2015).

5. Mobile Learning (m-learning)

Mobile learning also referred to as m-learning or m learning is a form of distance learning in which instructional contents or course materials are developed or consumed on hand-held *mobile* devices. Such e-resources are mobile phones, smartphones, tablet computer, laptops, MP3, MP4, MP5 players, digital cameras, camcoders, digital projectors, electronic boards, west band amplifiers, desktops, notebooks, palmtops etc. As opposed to e-learning or online learning, mobile learning has hand- held movable e-resource as its backbone.

Mobile technologies are affordable and have great potential in terms of reaching people who are marginalized by virtue of their location and are thus suitable for distance learning in situation whereby access to education is usually difficult such as in conflict-ridden or post-conflict or disaster zones.

4.0 Research Methodology

4.1 Area of Study: Enugu State, South-east, Nigeria

The historical origin of Enugu State under its present name could be traced directly to the creation of the old Enugu State on August 27, 1991 by the then military regime of Gen. Ibrahim Babangida and later to the excision of the then Abakaliki zone into the present of Ebonyi State in 1996 by the military administration of Gen. Sani Abacha. Following the said creation of Ebonyi State out of the old Enugu State, the present structure of Enugu State emerged in 1996. When Enugu State emerged in its present structure, it was carved up into seventeen (17) Local Government Areas (LGAs) as units of political administration at the grassroots level. The LGAs are Aninri, Awgu, Enugu East, Enugu North, Enugu South, Ezeagu, Igbo-Etiti, Igbo-Eze North, Igbo-Eze South, Isi-Uzo, Nkanu East, Nkanu West, Nsukka, Oji-River, Udenu, Udi, and Uzo-Uwani. Enugu metropolis which was the then capital of the defunct Eastern Region, the defunct East Central State, the old Anambra State, and the old Enugu State has remained the capital of the State till this day. The State is further carved into three senatorial Zones: Enugu East, Enugu West, and Enugu North.

Since its final birth in 1996, Enugu State has come under the administrations of seven State Chief Executives, namely, Navy Capt. Temison Ejoor (Jan. 1994 - Sept,. 1994), Col. Mike Torey (Sept. 1994 - Aug. 1996), Col. Sule Ahman (Aug. 1996-Aug. 1998), Navy Capt. Benson Agbaje

(Aug. 1998-May, 1999), Dr Chimaroke Nnamani (May, 1999- May, 2007), Barr. Sullivan Iheanacho Chime (May, 2007- May, 2015, and Rt. Hon Ifeanyi Ugwuanyi (May 2015- till date).

Today, under the present administration of Governor Ifeanyi Ugwuanyi, Enugu State operates a civil service made up 24 Ministries, a number of Departments and Agencies (MDAs). One of these Ministries is the Ministry of Education, which has a Department that oversees or interfaces with tertiary institutions of learning in the State.

Also located in Enugu State are a number of Federal Government's Ministries Departments and Agencies that oversee or interface with tertiary institutions of learning. Prominent among such agencies are Federal Ministry of Education, the National Universities Commission (NUC), National Board for Technical Education (NBTE), National Commission for Colleges of Education (NCCE), and Joint Admission and Matriculation Board (JAMB).

The history of tertiary education in Enugu State date back to the establishment of the defunct Nigerian College of Arts, Science and Technology, by the Federal Government on the recommendation of the Ashby Commission' on Higher Education, with branches in two other Nigerian towns of Zaria and Ibadan. The college which opened in 1955/56 academic session with a students' population of 240, offered classes in surveying, science, higher school certificate, secretarial skills, local government, arts and mining. By 1960, the institution was transformed into the first autonomous university in the country - the University of Nigeria, which has campuses at Enugu and Nsukka.

Enugu State also hosts the Enugu State University of Science and Technology (ESUT), Caritas University, Coal City University, the Institute of Management and Technology (IMT), the Bigard Memorial Seminary, the Institute of Ecumenical Education, the Federal School of Dental Technology, as well as Our Saviour Institute of Science, Agriculture and Technology (OSISATECH).

Since then, the number of tertiary institutions of learning has continued to increase in the State. Others recently established across the state include the Renaissance University, Ugbawka, Godfrey Okoye University, Madona University, Akpugo Campus, Federal College of Education, Eha-Amufu, Enugu State College of Education (Technical), Enugu, Enugu State Polytechnic, Iwollo, College of Education, Nsukka, Spiritan School of Theology, Attakwu, Peaceland College of Education, Enugu, the Nigeria Law School. Agbani, the Marist Brothers Polytechnic, Nike Enugu, and Landan School of Tourism & Hospitality, Enugu.

As at the time of this research, the number of students, academic and non-academic staff, and academic programmes of each of these tertiary institutions of learning have increased by leaps and bonds. Investigations also show that most of them teach Entrepreneurship Education (EE) both as an elective course or a full-fledged discipline.

4.2 Research Methods and Design

The research method adopted by this study was the quantitative method, while the research design of the study was sample survey research. In the said surrey, data were collected through structured questionnaire regarding such characteristic like age, gender, education,

income level, farm size and marital status. Others were issues on the three research constructs of the study: online learning, mobile learning, and e-learning platforms

4.3 Sampling and Sample Size Determination

A multi-stage sampling method was used for the selection of a representative sample. This sampling method is chosen because it is an advance of the principle of cluster sampling. The method is recommended for a big inquires extending to a considerable large geographical area (Kothari, 2004), like the case most study, which is e-learning in higher education institutions in Enugu State in South-east Nigeria. The merits of this method are that it is easier to administer than most single-stage designs, and a large number of units can be sampled for a given cost because of sequential clustering, whereas this is not possible in most of the sample designs. The population of lecturers, non-academic facilitators, and students of the departments of the five institutions sampled was 2,653.

From this population, a sample size for the study was determined using Kothari's Finite Population Correction Factor statistics, whose formula is given by:

$$n = \frac{z^2pq}{e^2}$$ (Kothari, 2004).

At the significance level of 5% (0.05) and confidence level of 95% or 1.96, 50% (0.5) proportion of an attribute of the population (p), and 50% 0.5) proportion of an attribute of the population not present (q) i.e. I-P, and 5% desired level of precision (e), the estimated sample size was 336. Sample Size for the study was, therefore, 336.

4.4 Data Collection

Data primary data and secondary data were collected by the study. The primary data were collected using well structured questionnaire that consisted of close-ended items. The said questionnaire was piloted at three (3) sample units for purpose of test-retest measurement. Results of the reliability test carried out on the questionnaire showed a Cronbach's Alpha Index of 0.823, which is well above 0.7 universal benchmark and, therefore, considered good enough for the field survey. The questionnaire was administered to 336 and respondents in the five institutions studied.

Data collected included those on the demographic characteristics of the respondents such as age, gender, marital status, education level, and income level of the respondents, among others. Data were also collected on the research constructs of the study such as the productivity level of the lecturers, students, and non-academic e-learning facilitators.
As earlier mentioned secondary data were also collected by the study through operation records of the institutions under investigation. These secondary data played very significant supportive role in the data analysis.

4.5 Method of Data Analysis

Responses of the lecturers, students and administrators were first coded into data using the Excel Spreadsheet. The resulting data were analysed using descriptive statistics which consisted of percentage, frequency counts, tables, mean, and coefficient of variation. Inferential statistics known as step-wise-Simple Linear Regression Analysis was used in testing the three hypotheses put forward for the study. In fact, this said Regression Model was

used to examine and establish the nature and degree of relationship between the conditions of rural access roads and farmers' agricultural proclivity level.

4.6 Analytical Model

4.6.1 Research Variables

The objective of inferential analysis at play was, of course, to establish whether there is a systematic relationship between the e-learning platforms and performance of lecturers, students, and e-learning facilitators and if there is any relationship whatsoever, to find out the degree of such relationship. A close look at the foregoing shows that many inter-dependent variables are at play and to that extent, its resolution calls for a statistical model that is also multivariate in nature. It is, therefore, for this purpose that a Multivariate Simple Linear Regression model was chosen for the analysis. The model was selected because the variables at play satisfied the three stipulated principles (i) there is only one dependent variable, (2) the dependent variable was not only parametric, but can also be numerically measured, and (3) these are more than one independent variables.

Social science researchers commonly describe the different ways they measure things numerically in terms of scales of measurement which come in three flavors: nominal, ordinal, and interval of ratio scales (Brown, 2001). Each is useful in its own way for quantifying different aspects of a variable.

4.6.2 Model Specification

The model for the Simple Linear Regression Analysis chosen for this study would be collectively specified as follows:

$Y = a_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots \beta_n X_n + u$----------(i)

In respect of the dependent variable and the individual independent variables, the model could also be specified as follows:

$Y = a_0 + \beta_1 X_1 \ldots\ldots \beta_n X_n + U_n$ - - - - (ii)

$Y = a_0 \times \beta_1 X_2 \ldots\ldots \beta_n X_n + U_n$ - - - - (iii)

$Y = a_0 + \beta_1 X_3 \ldots\ldots \beta X_n + U_n$ - - - - (iv)

In the four equations (i, ii, iii, and iv), the various notations are represented as follows:

Y = dependent variable (performance, proxy by performance of lecturers, performance of students, performance of non-academic e-learning facilitators)

a_0 = autonomous level of the dependent variable (performance) that is not in any way influenced by the various independent variables.

$\beta_1 - \beta_3 \ldots \beta_n$ = slope parameters (co-efficient of the independent variable, i.e. degree of the influence of the variable)

$X_1 - X_3 \ldots X_n$ = independent variables (online learning platform, mobile learning platform, e-learning platform).

U = stochastic term, i.e. unexplainable factors that were acting outside the model (Gausian white noise).

Decision Rule

The following hypothesis criteria were followed in the tests:

1. Reject the null hypothesis, where the beta term, $\beta \neq 0$, then accept the alternate hypothesis.
2. Reject the null hypothesis, where $p<0.05$, then accept the alternate hypothesis.

5.0 Results and Discussion

5.1 Results

Results of the analysis showed that out of the 336 copies of questionnaire distributed 305, (90.8%) were returned well completed. 22 (6.6%) were not returned at all, while 9 (2.7%) were returned but rejected owing to inappropriate completion. It was the responses borne by the 305 well completed questionnaires that were extracted and coded into data that were used for both the subsequent analysis and test.

5.2.3 Relationship between e-Learning Platforms and Performance of Lecturers, Students, and Non-Academic Facilitators/Staff.

1. Hypothesis No. 1

i. Online learning platform had no significant effect on the performance of lecturers on the delivery of courses in tertiary institutions in the COVID-19 pandemic era.

Table 1: Model summary

Model Summary (Goodness of Fit)

Model	R	R Square (R^2)	Adjusted R	Std. Error of the Estimate
1	.403	.162	.157	9.07299

a. Predictors (constant): Online learning platform

Table 2: ANOVA[b]

Model		Sum of squares	df	Mean Square	F	Sig.
Regression		6,125	2	6.125	74.402	.083[a]
1	Residual	2,470	303	8232		
Total		8,595	305			

a. Predictors (constant): Online learning platform
b. Dependent variable: performance of lecturers

Table 3: Coefficients[a]

Model	Unstandardized Coefficient		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	1.697	9.663	17.566	.000	
1 Online learning platform	-37.28	4.316	-.403	-.157	.083

a. Dependent variable: performance of lecturers

2. Hypothesis No. 2

ii. Mobile learning platform did not increase the performance of students in the learning of courses in tertiary institutions in the COVID-19 pandemic era.

Table4. Model Summary

Model	R	R Square (R^2)	Adjusted R	Std. Error of the Estimate
1	.309	.095	.089	3,91023

a. Predictors (constant): Mobile learning platform

Table 5: ANOVA[b]

Model		Sum of squares	df	Mean Square	F	Sig.
1	Regression	4,841	2	4,841	.317	.613[a]
	Residual	4,587	303	1.529		
	Total	9,428	305			

a. Predictors (constant): Mobile learning platform
b. Dependent variable: Performance of students

Table 6: Coefficients[a]

Model	Unstandardized Coefficient		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	4.720	7.648	7.648	.617	.581
1 Mobile learning platform	-10745.897	19097.045	-.309	-.563	.613

a. Dependent variable: Performance of students

3. Hypothesis No. 3

iii. e-learning platforms never caused any increase in the performance of non-academic facilitators/staff in the teaching/learning of courses in tertiary institutions in the COVID-19 pandemic era.

Table 7. Model Summary

Model	R	R Square (R^2)	Adjusted R	Std. Error of the Estimate
1	.462	.214	.209	2.29686

a. Predictors (constant): Learning platforms

Table 8: ANOVA[b]

Model		Sum of squares	df	Mean Square	F	Sig.
1	Regression	4,3041	2	4.304	.816	.433[a]
	Residual	1,5833	303	5.276		
	Total	5,8874	305			

a. Predictors (constant): e-learning platforms
b. Dependent variable: Performance of non-academic facilitators/staff

Table 9: Coefficients[a]

Model	Unstandardized Coefficient		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	Constant	1.651	2.601	6.346	.008
	e-learning platforms	-19.395	21.471	-462 -.903	.433

b. Dependent variable: Performance of non-academic facilitators/staff

Source: Field survey, 2021

5.2 Discussion

Hypothesis No. 1

Results of the analysis presented in Table 1 with regard to the first hypothesis showed that online learning platform as the independent variable was able to explain about 15.7% of the behavior of performance of lecturers, since the adjusted coefficient of determination (R^2) was 0.157. This suggests that the remaining 84.3% of the behaviour of performance of lecturers

could be attributed to some other deleterious factors that operated outside the regression model.

Table 2 showed that the explanatory variable (predictor) contributed significantly to the model with an F-ratio measure of 74.402 and a p-value of 0.083, which is greater than 0.05 (p=0.83>0.05). This clearly falls within the acceptance region of the hypothesis; which means that the research hypothesis should be accepted. Table 3 on its own showed that when performance of lecturers increased by 1, online learning platform decreased by 37.228 coefficients.

Hypothesis No. 2

With regard to Hypothesis No. 2, table 4 showed that mobile learning platform was able to explain 8.9% of the behaviour of performance of students, since the adjusted coefficient of determination (R^2) was 0.089. The foregoing means that the remaining 91.1% of the said behavior of performance of students could be attributed to certain factors operating outside the regression model. Table 5 showed that the independent (predictor) variable contributed as little as 0.317 to the model and a probability value (p-value) of 0.613, which is greater than the significance level of 0.05 (i.e. p=0.613 >0.05). The foregoing results clearly fall within the acceptance region of the research hypothesis, which means that we should accept the hypothesis of this research. Table 6 also showed that as the performance of students increased by 1 coefficient, mobile learning platform decreased by 10745.897 coefficients.

Hypothesis No. 3

Furthermore, the results of the analysis performed on the data collected with respect to hypothesis No. 3 as presented in Table 7 showed that e-learning platforms as the explanatory (predictor) variable was able to explain about 20.9% of the behavior of performance of non-academic facilitators/staff, since the adjusted coefficient of determination (R^2) was 0.209. This suggests that the remaining 71.9% of the behavior of performance of non-academic facilitators/staff, since the adjusted coefficient of determination (R^2) was 0.209. This suggests that the remaining 71.9% of the behavior of performance of non-academic facilitators/staff could be attributed to factors that operated outside the regression model for the research. Table 8 also showed that the predictor (explanatory) variable contributed as little as 6.346 and a p-value of 0.433, which is greater than 0.05 stipulated significance level of 0.05 (i.e. p=0.43 > 0.05). The foregoing result clearly falls within the acceptance level of the research hypothesis, which means that we should, therefore, accept the hypothesis of the research as earlier put forward. Table 9 also showed that when performance of non-academic facilitators/staff increased by 1 coefficient, e-learning platform decreased by -19.395 coefficients.

Conclusion

It is the conclusion of this study that generally the e-learning platforms are significantly correlated with the performance of lecturers, students, and non-academic staff in the learning of Public Administration courses in tertiary institutions during the COVID-19 pandemic era. It was found, however, that the e-learning platforms such as online learning and mobile learning platforms had no significant influence on the teaching and learning of courses in most tertiary institutions in Nigeria in the COVID-19 pandemic era. This was exemplified in the fact that none of the e-learning platforms, especially online learning and mobile learning platforms caused any significant increase in the performance of lecturers, students, and non-

academic staff in the teaching, learning, and administration of courses so far in the COVID-19 pandemic era in the various tertiary institutions in Enugu State.

It is also the conclusion of this study that the foregoing revelations were attributable to the fact that e-learning model has not been effectively incorporated into the tertiary education system in Nigeria. This might be as a consequence of the various obstacles or challenges associated with the e-learning education in a developing country like Nigeria such as the issue of poor funding, unstable power supply, high cost of ICTs, inadequate trained staff, and poor internet connectivity among others. These factors might had intervened in the Regression Analysis of the study which affirmed the significance and negative influence of the e-learning platforms on the performance of lecturers, students, and non-academic staff in the teaching and learning of courses in the COVID-19 pandemic era in the various HEIs studied. The implications of the foregoing is that stakeholders in the higher education sub-sector in Nigeria have to brace up to the challenges ahead as the COVID-19 pandemic era continues unabated with no known cure found against the dreaded coronavirus disease.

Recommendations

Globally, e-learning has been identified as an indispensable intervention to cushion the impact of the COVID-19 pandemic and as well as for rapid growth and development in the education sector of any nation. The advantages of e-learning include wide coverage, cost-effectiveness, uniformity, fast teaching and learning and learning process, and rapid economic development through e-commerce. It is hereby recommended that compliance to e-learning in the tertiary institutions should go beyond the COVID-19 locked down period, while staff training and capacity building on e-learning should be put in place by the institutions' authorities. The government should address challenges limiting e-learning in the tertiary institutions through provision of stable power supply, increased funding of HEIs, and training. Local industries should also be encouraged to manufacture some ICT prototypes and accessories to lessen the cost of acquisition arising from a high tariff. These recommendations become very important going by the rapidly changing world of basic education through digitization.

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