POST-COVID 19 CLASSROOM TECHNOLOGICAL APPLICATIONS AS CORRELATE OF LECTURERS INSTRUCTIONAL EFFECTIVENESS IN PUBLIC UNIVERSITIES IN SOUTH EAST, NIGERIA.

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Abstract

The study examined post-covid classroom technological applications as correlates of lecturer's instructional effectiveness in public universities in South East Nigeria. Two research questions were answered and two null hypotheses postulated and tested at 0.05 level of significance guided the study. The study adopted a correlational design. The population was 634 lecturers from six colleges and faculties of education in the studied universities. The sample size was 317 lecturers which represented 50% of the population. This consisted of 80 lecturers' from Michael Okpra University of Agriculture, Umudike (MOUAU), 75 lecturers from University of Nigeria, Nsukka (UNN), 53 lecturers' from Alex Ekwueme Federal University Ndufo Alike Ikwo (AE-FUNAI), 28 lecturers from Abia State University, Uturu (ABSU), 48 lecturers from Imo State University, Owerri (IMSU) and 33 lecturers from Ebonyi State University Abakaliki (EBSU). The sample was arrived at using four-staged sampling technique. Data for the study was collected using researchers' self-developed questionnaires titled Post-covid Classroom Technological Application Questionnaire (PCCTAQ) and Lecturers Instructional Effectiveness Questionnaire (LIEQ). The instruments were validated by two experts from the Department of Educational Management and one expert from the Department of Science Education specialized in Measurement and Evaluation, all from MOUAU. The reliability of the instruments was determined using Cronbach Alpha Method which yielded an alpha of.79 and .80 respectively which were considered reliable. Data were analyzed using Pearson Product Moment Correlation Coefficient (PPMCC) to answer the research questions while linear regression analysis was used to test the null hypotheses at .05 level of significance. The findings of the study revealed that use of WhatsApp application technologies to a positive low extent correlate with lecturers' instructional effectiveness in public universities; Game software application technology has a positive weak correlation with lecturers instructional effectiveness in public universities in south east, Nigeria; Use of facebook application technology to a positive low extent relationship lecturers instructional effectiveness in public universities in south east, Nigeria. The researchers recommended that there should be practical simulation of mobile apps into the curriculum; that game software related to various disciplines of learning should be used in order to facilitate instruction; that there is need to introduce the policy of on-your-mobile classroom-gadget (OYOMOCAG) by education policy makers in conjunction with federal government of Nigeria.

Keywords: *Mobile application, Covid-19, WhatsApp, game software, facebook application, instructional effectiveness.*

Introduction

Technology has actually expanded the horizon of societies in terms of social, political, religious, economic, educational and tourism as such every sector of the economy looks beyond the best practice/technological gadgets in achieving its targeted production level. The need for introduction and

utilization of classroom technological applications in our university system in Nigeria and other West African countries become needful as a result of the emergence of the novel Corona Virus known as COVID19.
The outbreak of the first index case of the novel corona virus was recognized in China in December 2019. John Hopkins University (2020) defined corona virus as non-living organism but a protein molecule (DNA) covered by a protective layer lipid (fat) which when absorbed by the cells of the ocular, nasal or buccal mucosa, changes their genetic codes in form of mutation and thus convert them into aggressor a multiplier cells. During the outbreak of COVID19, many debate has emerged in the plight of this virus on how to achieve the purpose of the educational industry. It thus become pertinent to say that one of the best approaches towards achieving the educational goals in West African Countries remain the adoption, availability and utilization of classroom technological applications for instructional delivery at all levels of the education system.

The use of post-covid 19 technological gadgets such as WhatsApp, game software and Facebook amongst other mobile supported technologies facilities social distancing and other COVID19 protocol towards achieving healthy environment and healthy participants in education system in ensuring quality instructional outcome. The emergence of technology thus introduced the present- day society to technological applications which facilitates quality and effective new approach to sustainable interaction and accessing educative information in the global education system.

WhatsApp is a social platform that gives room to interact and communicate with people irrespective of their location. It has an application that operates with the aid of a mobile phone network or wireless fidelity (Wi-Fi). Hindu (2011) concerted that is a cross platform instant messaging application that allows iPhone, Android, BlackBerry, window phone and Nokia smart phone users to exchange text, calls, image, video and audio message for free. This application is commonly used in various institutions to reach out to collogue. Fawzi (2017) averred that WhatsApp applications have many features and saves teachers time so the class can further collaborate, discuss, extend and grow as a community of learners and increase engagement, interaction with your students 'way to leverage the power of student responses and use the live, real-time data to inform instruction.

The use of gamified elements for instructional delivery remains an emerging concept in the educational system. Ogedi, Bappah and Nwialu (2017) defined gamification as a technological means of learning in educational context to play a vital role in creative and innovative idea among students. Its relevance and usefulness cannot be over emphasized such game console plays a vital role in the instructional exercise. Game software specifically was designed to facilitate high-tech thinking, innovation and creativity amongst students; engage students in lecture content thereby delivering of multiple-choice questions, construction, architectural designs, carry out surgical practical by students using personal mobile devices for post and pre-tutorial lectures. Kelley and Whatson (2013) defined game application as a systematically software designed to assess students on what they learnt in the low-stake environment thus consolidate their knowledge of the instructional content. Ekaterina, Daniel, Grainne, Daniel and Dan (2017) concerted that learners' motivation remains primary concern of game-based mobile learning initiatives with developers and educators alike trialing different approach of introducing game element into the learning process. Gamified learning to a certain extent will increase students' participation, engagement and motivation in understanding the instructional content as well as pave way for experimental learning and self-reliance learning.

Facebook remain one of the social network and mobile application that is popularly used by people in their daily communication world over. It can permit you to send friendship request as well as to accept request from friends. It also permits for site or group creation for interaction, to share videos, information of all kind, market your products and carry out learning exercise. Face book also has what we called news feed. Boyd and Elission in Ogedi (2021) defined Facebook as social networking site that offers an online platform on which users create profiles, generate and share contents and information, and interact with other known and unknown contacts. In essence denotes that face book as a mobile application technology can support effective interaction between the lecturers' and the students since most lecturers' and students spends their time in social networking sites. A user likely share information with their contacts (i.e., "friends"), involves in group discussions, uploads and downloads videos and pictures, watch online videos as well as play online music.

Statement of the Problem

The present-day society is marked by its technological trends in carrying out daily transactions. This has made post covid-19 classroom technological applications to be compatible with mobile phones such as

smart phones, iPhones, tablets, apple phones for convenient sourcing of information using the internet. Ideally, classroom technological application such as WhatsApp, game software and facebook application remain essential in applying technology in achieving effective delivery of instruction amongst lecturers. This involves instructional effectiveness, lecturers' positive attitude towards the use of post-covid 19 classroom technologies, constant power supply, good network operator, low cost of internet access, competence in using mobile application technologies amongst lecturers. Competence among students, good management strategies in using classroom technologies, use technologies for effective instructional control, organization and implementation remain vital in the 21st century classroom.

Currently in the education system, efforts have been made by the university management to provide Wi-Fi network within the university range but not connected to lecturers' and students' cell phones as a result of high cost of internet subscription. The cost of providing mobile phones and the installation of applications that supports instructional activities in the classroom is incurred by the lecturers' and students; poor practical use of mobile application technologies for instruction delivery and manipulative skills in using mobile apps for social networking and other social activities remain trendy among users of mobile phone.

However, it seems that the use of technology in the education system has remained a serious problem in the use of post covid-19 classroom technologies for effective delivery of instruction amongst lecturers. The problem of instructional ineffectiveness and management of learning caused by non-availability of these classroom technologies, poor network operating system, high cost of internet access, unwilling attitude among lecturers to adopt new technologies for instructional delivery, incompetence in using emergent mobile technological facilities by lecturers, not believing to have control over technologies by lecturers. The issue of poor instructional activities using classroom technologies, inability to adapt to paradigm shift in technology by the lecturers and students amongst others remain a constraint faced by todays educational system in adjusting learning towards technological approach.

The problem of this study put in question form is; how do post-covid classroom technological applications correlates with lecturers instructional effectiveness in public universities in South East, Nigeria?

Purpose of the Study

The purpose of this study is to ascertain if post-covid classroom technological applications correlate of lecturers instructional effectiveness in public universities in South East, Nigeria. Specifically, the study seeks to:

1. Determine the extent to which use of WhatsApp mobile application technology in the university relate to lecturers instructional effectiveness.
2. Determine extent to which game software mobile application relate to lecturers instructional effectiveness.
3. Determine the extent to which use of facebook mobile application relate to lecturers instructional effectiveness.

Research Questions

The following research questions were asked to guide the study:

1. To what extent does the use of WhatsApp application technology relate to lecturers instructional effectiveness?
2. To what extent does the use of game software mobile application relate to lecturers instructional effectiveness?
3. To what extent does the use of facebook mobile application relate to lecturers instructional effectiveness?

Hypotheses

The following null hypotheses were formulated and was tested at 0.05 level of significance to guide the study:

$H0_1$: There is no significant relationship between the use of WhatsApp application technology and lecturers instructional effectiveness.

$H0_2$: There is no significant relationship between game software mobile application and lecturers instructional effectiveness.

$H0_3$: There is no significant relationship between the use of facebook mobile application and lecturers instructional effectiveness.

Methodology

The study adopted a correlational design. The design was used to ascertain the perception of the lecturers on managing learning strategies as a correlate of lecturers' instructional effectiveness in public universities in South East Nigeria. Maduabum (2014) opined that correlational design is one aimed at determining the relationship between variables which enable a researcher to ascertain the extent to which variation in one variable is associated with variation in another. The accessible population of this study was 634 lecturers from six colleges or faculties of education from the studied universities. The universities studied were University of Nigeria Nsukka (151 lecturers), Michael Okpara University of Agriculture Umudike (161 lecturers), Alex Ekwueme Federal University Ndufo Alike Ikwo (106 lecturers), Abia State University Uturu (56 lecturers), Imo State University Owerri (95 lecturers) and Ebonyi State University, Abakaliki (65 lecturers). (Personnel Administration Department MOUAU, AEFUNAI, UNN, ABSU, EBSU and IMSU).

Sample and Sampling Techniques

The sample size for this study was 317 lecturers which represented 50% of the population. This consisted of 75 lecturers from UNN, 80 lecturers from MOUAU, 53 lecturers from FUNAI, 28 lecturers from ABSU, 48 lecturers from IMSU and 33 lecturers from EBSU. The sample was arrived at using four-staged sampling technique.

In the first stage, the researchers' adopted a purposive sampling technique in selecting six universities out of ten universities in south east Nigeria. The choice of the institutions was on the bases that the selected institutions have functional education faculties and lecturers to respond to the instruments. In the second stage, quota sampling technique by convenience was used by the researchers to select respondents based on the departments offering education. Johnson and Christensen (2000) opined that in quota sampling, the researcher determines the appropriate sample size or quotas for the groups identified as important and take convenience sample from those groups. Thirdly, simple random sampling technique was used by the researchers to select the sample size. The use of simple random sampling technique was justified because the respondents were given equal opportunity to be selected for the study. Finally, Proportionate stratified random sampling technique was used to select the sample size of the study from the six universities involved. This was done using sample fraction of .5. Ball and Gall in Uzoagulu (2011) opined that for a population of 1000 use 20%, for 5000 use 10% and a population of 10,000 use 5%. Supporting this view, Nwana in Uzoagulu (2011) opined that no fixed number or percentage is ideal rather it depends on the circumstances of the study that determines what number or percentage of the population should be used. The researcher justified the use of 50% of the population on the bases of the view of Nwana and also if 20% of population of 1,000 is 200 and the researcher used 50% of a population of 634 which gave a sizes sample of 317. Post-covid Classroom Technological Application Questionnaire (PCCTAQ) and ''Lecturers' Instructional Effectiveness Questionnaire'' (LIEQ) were used for data collection. The instruments were face validated by two experts from the Department of Educational Management and one expert from the Department of Science of Education all from Michael Okpara University of Agriculture Umudike. Croanbach alpha method was used to test the internal consistency of the instruments which yielded an index of .79 for PCCTAQ and .80 for LIEQ. The data collected from the field were analyzed using Pearson Product Moment Correlation Coefficient to answer the research questions while linear regression analysis was used to test the null hypotheses at .05 level of significance.

Decision Rule:

The strength of the relationship was established using Creswell (2008) correlation coefficient scale thus +/-.70 to 1.00 Strong/High Extent relationship, +/-.40 to .69 as Moderate/Medium Extent relationship and +/-.00 to .39 no correlation/ weak Extent relationship

Data Analyses

This chapter presents the results of the data analyses and discussions of the findings of the study. It consisted of result presentation, testing of hypotheses, findings and discussion. A total of 317 copies of the questionnaire were distributed to lecturers in public universities in south east, Nigeria. Two hundred and fifty-nine copies of the questionnaire were completed and returned from public universities studied. This gave 81.7% of the return rate of the questionnaire administered to the respondents. More so, the remaining 58 copies of the questionnaire showed that 17 copies were not adequately filled and completed which gave 5.3%

not returned while 41 copies of the questionnaire were not retrieved from the respondents which gave 13%. In all, the percentage of unreturned questionnaire stood at 18.3%.

Result Presentation

Research Question One

To what extent does the use of WhatsApp application technology relate to lecturers instructional effectiveness?

Table 1: Correlation Matrix of Use of WhatsApp and Lecturers Instructional Effectiveness

		WAT	LIE
WAT	Pearson Correlation	1	.239**
	Sig. (2-tailed)		.000
	N	259	259
LIE	Pearson Correlation	.239**	1
	Sig. (2-tailed)	.000	
	R^2	.057	
	N	259	259

**. Correlation is significant at the 0.05 level (2-tailed).

Data in table 1 indicated a correlation coefficient (r) of .239 which is a positive correlation and is within the coefficient limit of+/-0.00 to 0.39 indicating no correlation/ weak/Low Extent relationship. This indicates that use of WhatsApp application to a positive low extent relates with lecturers instructional effectiveness in public universities in south east Nigeria. The coefficient determination (R^2) .057 indicates that 5.7% of the variance observed in the use of Mobile application technologies is explained by the variation in instructional lecturers instructional effectiveness. It implies that use of WhatsApp application technologies has a weak positive relationship with lecturers instructional effectiveness in public universities in south east, Nigeria.

Hypothesis One

Table 2: Regression Analysis of Relationship Between use of WhatsApp Application Technology and Lecturers Instructional Effectiveness

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11.371	1	11.371	15.560	.000[a]
	Residual	187.818	258	.731		
	Total	199.189	259			

There is no significant relationship between the use of WhatsApp application technology and lecturers instructional effectiveness.

a. Predictors: (Constant), WAT
b. Dependent Variable: LIE f = degree of freedom, F = F-calculated, correlation is significant at 0.05 level (2 tailed)

Data in table 2 revealed that F-calculated value of 15.560 at 0.05 level of significance. The table also shows that the P-value of .000[a]which is less than the alpha value at 0.05; thus, null hypothesis which states that there is no significant relationship between whatsapp application technology and lecturers instructional effectiveness in public universities in South East, Nigeria was rejected. This mean that use whatsapp application technology significantly relate with lecturers instructional effectiveness in public universities in south east Nigeria.

Research Question Two
To what extent does the use of game software mobile application relate to lecturers instructional effectiveness?

Table 3: Correlation Matrix of Use of Game Software Application and Instructional Effectiveness

		GSA	LIE
MAT	Pearson Correlation	1	.300**
	Sig. (2-tailed)		.000
	N	259	259
LIE	Pearson Correlation	.300**	1
	Sig. (2-tailed)	.000	
	R^2	.090	
	N	259	259

**. Correlation is significant at the 0.05 level (2-tailed).

Data on table 3 indicated a correlation coefficient (r) of .300 which is a positive correlation and is within the coefficient limit of+/-0.00 to 0.39 indicating no correlation/ weak/low extent relationship. This indicates that use of game software to a positive low extent relates with lecturers instructional effectiveness in public universities in south east Nigeria. The coefficient determination (R^2) .090 indicates that 9% of the variance observed in the use of game software is explained by variation in lecturers instructional effectiveness. It implies that use of game software application technology has a weak or low extent correlate with lecturers instructional effectiveness in public universities in south east, Nigeria.

Hypothesis Two
There is no significant relationship between game software application and lecturers instructional effectiveness.

Table 4: Regression analysis of relationship between use of game software application technology and lecturers instructional effectiveness

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20.251	1	20.251	25.397	.000[a]
	Residual	204.930	258	.797		
	Total	225.181	259			

a. Predictors: (Constant), GSA
b. Dependent Variable: LIE f = degree of freedom, F = F-calculated, correlation is significant at 0.05 level (2 tailed)

Data on table 4 revealed that F-calculated value of 25.397 at 0.05 level of significance. The table also shows that the P-value of .000[a] which is less than the alpha value at 0.05; thus, null hypothesis which states that There is no significant relationship between use of mobile application technology and lecturers instructional effectiveness in public universities in South East, Nigeria was rejected. This mean that use of game software application technologies significantly relate with lecturers instructional effectiveness in public universities in south east, Nigeria.

Research Question Three
To what extent does use of facebook mobile application relate to lecturers instructional effectiveness?

Table 5: Correlation Matrix of Use of Facebook Application and Instructional Effectiveness

		FAT	LIE
FAT	Pearson Correlation	1	.333**
	Sig. (2-tailed)		.000
LIE	Pearson Correlation	.333	1
	Sig. (2-tailed)	.000	
	R^2	.111	
	N	259	

**. Correlation is significant at the 0.05 level (2-tailed).
Data on table 5 indicated a correlation coefficient (r) of .333 which is a positive correlation and is within the coefficient limit of+/-0.00 to 0.33 indicating no correlation/ weak/low extent relationship. This indicates that use of game software to a positive low extent relates with lecturers instructional effectiveness in public universities in south east Nigeria. The coefficient determination (R^2) .111 indicates that 11% of the variance observed in the use of game software is explained by the variation in lecturers instructional effectiveness. It implies that use of facebook application technology has a weak relationship with lecturers instructional effectiveness in public universities in south east, Nigeria.

Hypothesis Three
There is no significant relationship between use of facebook mobile application and lecturers instructional effectiveness

Table 6: Regression Analysis of Relationship Between Use of Facebook Software Application Technology and Lecturers Instructional Effectiveness

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.880	1	24.880	34.667	.000[a]
	Residual	199.517	258	.718		
	Total	224.397	259			

a. Predictors: (Constant), FAT
b. Dependent Variable: LIE
Df = degree of freedom, F = F-calculated, correlation is significant at 0.05 level (2tailed)

Data on table 6 revealed that F-calculated value of 34.667 at 0.05 level of significance. The table also shows that the P-value of .000[a]which is less than the alpha value at 0.05; thus, null hypothesis which states that There is no significant relationship between use of mobile application technology and lecturers instructional effectiveness in public universities in South East, Nigeria was rejected. This mean that use of facebook application technologies significantly relate with lecturers instructional effectiveness in public universities in south east, Nigeria.

Findings of the Study
The study made the following findings:
1. That use of WhatsApp application technologies to a positive low extent correlate with lecturers' instructional effectiveness in public universities.
2. Game software application technology has a positive weak correlation with lecturers instructional effectiveness in public universities in south east, Nigeria.

3. Use of facebook application technology to a positive low extent relationship lecturers instructional effectiveness in public universities in south east, Nigeria.

Extent of use of WhatsApp application technology and lecturers instructional effectiveness

Data on table 1 and 2 indicated a correlation coefficient (r) of .239 which is a positive correlation and is within the coefficient limit of+/-0.00 to 0.39 indicating no correlation/ weak/low extent relationship and F-calculated value of 15.560 at 0.05 level of significance. This indicates that use of WhatsApp application to a positive low extent relates with lecturers instructional effectiveness in public universities in south east, Nigeria. The coefficient determination (R^2) .057 indicates that 5.7% of the variance observed in the use of WhatsApp technology is explained by the variation in lecturers instructional effectiveness. The table also shows that the P-value of .000[a] which is less than the alpha value at 0.05; thus, null hypothesis which states that There is no significant relationship between WhatsApp application technology and lecturers instructional effectiveness in public universities in South East, Nigeria was rejected. This mean that WhatsApp application technology significantly relate with lecturers instructional effectiveness in public universities in south east, Nigeria. Fawzi (2017) avers that WhatsApp applications have many features and saves teachers time so the class can further collaborate, discuss, extend and grow as a community of learners and increase engagement, interaction with your students 'way to leverage the power of student responses and use the live, real-time data to inform instruction.

Extent of use of game software and instructional delivery relate to lecturers instructional effectiveness

Data on table 3 and 4 indicated a correlation coefficient (r) of .30 and F-calculated value of 25.397 at 0.05 level of significance which is a positive correlation and is within the coefficient limit of+/-0.00 to 0.39 indicating no correlation/ weak/low extent relationship. The coefficient determination (R^2) .090 indicates that 9.0% of the variance observed in the use of game software is explained by the variation in lecturers instructional effectiveness. It implies that use of game software application technology to a positive weak extent correlate with lecturers instructional effectiveness in public universities in south east, Nigeria. The table also shows that the P-value of .000[a] is less than the alpha value at 0.05; thus, null hypothesis which states that there is no significant relationship between use of mobile application technology and lecturers instructional effectiveness in public universities in south east, Nigeria was rejected. This mean that use of game software application technologies significantly relate with lecturers instructional effectiveness in public universities in South East Nigeria. This finding agreed with the work of Ekaterina, Daniel, Grainne, Daniel and Dan (2017) which indicates that students who used the game app demonstrated an average grade/percentage mark of 65.19% while those who did not use the app have a percentage of 58.16%. It also found that a significant positive correlation of .40 was found between performing well on the app task and achieving higher academic grades. Hamri, Koivisto and Sarsa (2014) argued that applications with gamified elements integrated into their design facilitate learning which can engage and encourage students in terms of retention. In essence, use of mobile application technology for instructional delivery tends to facilitate collaborative learning as well as ensure hi-tech thinking among lecturers and students.

Extent of use of facebook mobile application and lecturers instructional effectiveness

Data on table 5 and 6 indicated a correlation coefficient (r) of .300 and F-calculated value of 34.667 at 0.05 level of significance which is a positive correlation and is within the coefficient limit of+/-0.00 to 0.33 indicating no correlation/ weak/low extent relationship. This indicates that use of game software to a positive low extent relates with lecturers instructional effectiveness in public universities in south east, Nigeria. The coefficient determination (R^2) .111 indicates that 11% of the variance observed in the use of facebook mobile application is explained by the variation in lecturers instructional effectiveness. It implies that use of facebook application technology to a positive low extent correlate with lecturers instructional effectiveness in public universities in south east, Nigeria. The table also shows that the P-value of .000[a] is less than the alpha value at 0.05; thus, null hypothesis which states that there is no significant relationship between use of mobile application technology and lecturers instructional effectiveness in public universities in South East, Nigeria was rejected. This mean that use of facebook application technologies significantly relate with lecturers instructional effectiveness in public universities in south east Nigeria. The study of Saeed, Yang and Sinnappans (2009) suggested that learners today are flexible in stretching their learning styles such that they are able to accommodate varying instructional strategies.

Recommendations

1. There should be practical simulation of mobile apps into the curriculum.
2. Game software related to various disciplines of learning should be used in order to facilitate instruction.
3. There is need to introduce the policy of on-your-mobile classroom-gadget (OYOMOCAG) by education policy makers in conjunction with federal government of Nigeria.

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