Managing University Education with Emerging Technologies for Quality Service Delivery during Post COVID-19 Pandemic era in Public Universities in Cross River State, Nigeria

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Abstract

This study surveyed the effect of managing university education with emerging technologies on quality service delivery among academics during post COVID-19 Pandemic era in public universities in Cross River State, Nigeria. To achieve this purpose, a correlational survey research design was adopted, a research question was raised and two null hypotheses were formulated to guide the study. The population of the study comprised 4,772 academic staff from two public Universities in Cross River State, Nigeria. Stratified and proportionate sampling technique was used to sample 400 academic staff and used for the study. The instrument used for data collection was a questionnaire titled: Managing University Education with Emerging Technologies and Quality Service Delivery Survey (MUEETQSDS). The instrument was validated and reliability was established through Cronbach Alpha analysis which yielded .91 hence indicating high internal consistency in achieving the purpose of this study. Data collected were analyzed using Pearson's product moment correlation statistic. The findings revealed that managing emerging technologies in terms of virtual and augmented reality were significant correlates of quality service delivery among academics in terms of teaching delivery, research publication and project supervision in public Universities during post COVID-19 Pandemic era in Cross River State. Based on the findings and discussion, conclusions were made. It was therefore recommended among others that educational administrators should ensure the provision of relevant infrastructures to facilitate the adoption and integration of emerging educational technologies. Also, there should be an increased budgetary allocation for educational institutions to improve their capacity to acquire, implement, upgrade and maintain emerging technologies for academic staff quality service delivery in public universities in Cross River State.

Keywords: University Education, Emerging Technologies, service delivery, COVID-19 Pandemic

Introduction

University education is the most prestigious and highly sought-after component of tertiary education. It is established to train people to acquire various educational degrees through quality teaching and world class research so as to bridge manpower needs of nations. More often than not, a university graduate is seen as an exceptional figure the world over, imbued with uncommon traits not found in other certificate holders due to the quality of university education acquired (Uzoigwe, Owashi & Opuwari, 2020). This perception accounts for why managing this level of tertiary education with emerging technologies for quality service delivery during post COVID-19 pandemic era is deemed extremely relevant (Ukpong & Uzoigwe, 2020).

COVID-19 is an acronym for a disease caused by a new strain of coronavirus: 'CO' stands for corona, 'VI' for virus, and 'D' for disease. Formerly, this kind of disease was referred to as '2019

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novel coronavirus,' or '2019-nCoV' because it is a new virus linked to the same family of viruses as Severe Acute Respiratory Syndrome (SARS) and some types of common cold (Ukpong & Uzoigwe, 2020). However, symptoms can include fever, cough and shortness of breath. In more severe cases, infection can cause pneumonia or breathing difficulties. More rarely, the disease can be fatal. These symptoms are similar to the flu (influenza) or the common cold, which are a lot more common than COVID-19 (Uzoigwe, Owashi & Opuwari, 2020). This is why diagnostic testing is required to confirm if someone has COVID-19 (Ukpong &Uzoigwe, 2020). The virus is transmitted through direct contact with respiratory droplets of an infected person (generated through coughing and sneezing). Individuals can also be infected from and touching surfaces contaminated with the virus and touching their face (e.g., eyes, nose and mouth). The COVID-19 virus may survive on surfaces for several hours, but simple disinfectants can kill it (Uzoigwe, Owashi & Opuwari, 2020).

After the pandemic experience, schools globally are incorporating emerging technologies, such as Virtual Reality and Augmented Reality, into the classroom. Emerging technologies are integrated in school management during the post pandemic era because teachers think that using emerging technologies better prepares students for future careers (Craig 2017). The aim is also to enable more innovative and engaging teaching methods and learning experiences. Spector in Edeh, Sharma, Nwafor, Fyneface, Sen and Edeh (2020) states that learning is characterized by stable and persistent changes in what a person or a group of people know and can do. The biggest change in the present era is the application of emerging technologies. Emerging technologies provide opportunities for educators to improve their skills and service delivery. It introduces flexibility to teaching and learning process, and takes teaching and learning beyond the physical classrooms.

The Design-Based Research Collective in Akuegwu and Nwi-ue (2016) conceive academic service delivery as a teaching method which promotes student learning through active participation in meaningfully planned services ranging from the school community to course content in tertiary institutions. These service deliveries among others include teaching delivery, research publication and project supervision. One of the services delivered by lecturers in the University is teaching. Teaching delivery refers to the interaction among the student, the teacher, the content, and the knowledge/skills/dispositions students will need for learning and collaborating with others in a diverse society and rapidly changing world. Research publication is a periodical scholarship relating to a particular academic discipline which serves as a permanent and transparent forum for the presentation, scrutiny, and discussion of research findings. Another dimension of academic service delivery is project supervision. It is a professional guidance and counselling service given by a lecturer to a student during project evaluation and recommending report to identify issues and opportunities to improve performance.

Unfortunately, the researcher has observed that the rate of poor academic service delivery among lecturers in Cross River State Public Universities is alarming in terms poor teaching delivery, research publication and project supervision. It has been observed that one of the constraints to the acquisition of digital literacy by 21st century academics in their job performance include poor attitude of staff in updating themselves with digital literacy skills, lack of interest by the school management by not sending their staff to upgrade their digital skills, limited opportunities offered for training opportunities, poor ICT infrastructure, technophobia, and so on. It has also been observed that some lecturers hardly prepare their lecturers before coming to classes. They tend to go by "put my name syndrome" in research publications. Some lecturers do not make up a good time to attend to their project students. Some academic staff do not seem to provide interesting academic experience to students. They do not organise activities, and materials, including some novelty and variety in tasks and learning activities. There is lack of clear and accurate feedback regarding competence and self-efficacy, focusing on the development of expertise and skill. Some lecturers hardly build supportive and caring personal relationships in the community of learners. Some academic staff seem to

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encourage sorting of courses other than promoting hard work among students. In other words, Lin (2017) concluded that integration of emerging technologies in managing tertiary institutions promotes effective service delivery among lecturers. Similarly, Isaiah and Wagbara (2019) found that quality management of emerging technologies such as virtual reality and augmented reality is a prerequisite for effective service delivery among academics in terms of teaching delivery, community service, research and project supervision in the school system.

Virtual Reality is a computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors. Virtual reality is one of the components of emerging technologies in the 21st century which may likely promote quality service delivery among lecturers if it is effectively management. Cheng (2021) examined the integration of virtual reality (VR) information technology in the teaching of systems of linear equations in three variables in a high school mathematics class. The result of data showed that VR technology is a suitable tool for teaching high school mathematics, when it combined with the tradition curriculum were well-received and facilitate effective learning. In addition, the desktop-based VR system is found to be superior to the all-in-one VR system in terms of learning effectiveness since the high-efficiency display and better control. Mike and Wang (2017) carried out a study on the effect of virtual reality 3d exploratory education on students' creativity and leadership. The results showed significant effects of exploratory education on creativity, the optimal creativity promoted by exploratory education with virtual reality, remarkable effects of exploratory education on leadership, and the optimal leadership enhanced by exploratory education with virtual reality.

Another aspect of managing emerging technologies in augmented reality. It is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. Hakan and Hazmin (2021) found that students' achievement and attitudes towards the science course increased significantly with Augmented Reality (AR) based applications. Johnson and Jacques (2019) found that using an augmented reality mobile application increased the quality-of-service delivery of academics and learning motivation of students. The attention, satisfaction, and confidence factors of motivation were increased, and these results were found to be significant.

Managing University education with emerging technologies entails the process of providing and maintaining human, materials and financials resources for integrating technologies in the school system Johnson and Jacques (2019). Unfortunately, in Cross River State Public Universities, poor management of university education with emerging technologies has exacerbated poor quality service delivery among academics during post COVID-19 Pandemic era in Cross River State Public Universities, Nigeria. In a study carried out by Edeh, Sharma, Nwafor, Fyneface, Sen and Edeh (2020) on the impact of emerging technologies on the job performance of lecturers in selected tertiary institutions in Nigeria. Data were collected through structured questionnaires administered to 152 educators selected from five different tertiary institutions in Nigeria. The collected data were later analyzed using STATA/regression Analysis. It was found that several factors such as poor network and electricity issues were found to limit the use of emerging technologies by lecturers. Similarly, Bozalek, Ngambi and Gachago (2021) found that, in order to foster a greater uptake or more institution-wide diffusion of use of emerging technologies, institutional opinion leaders need to purposefully create an enabling environment by giving recognition to and communicating with change agents, and developing policies that will encourage institutional-wide engagement with emerging technologies.

Edeh (2019) found a number of challenges impeding the management of tertiary institutions with emerging technologies to include: epileptic power supply, insufficient skills, availability and

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accessibility issues, funding, inadequate professional development, and poor internet connectivity. Correspondingly, Davis (2012) found that poor utilization of technological instruction in this instance did not increase student academic achievement. Ghavifekr and Rosdy (2015) found that poor integration of emerging technologies has a negative impact on both teachers and the students. It was also found that teachers' poor-equipped/preparation with technological tools and facilities is one of the main factors in unsuccessful of technology-based teaching and learning. It was also found that professional development training programs for teachers also played a key role in enhancing students' quality learning. Hero (2019) found that for all the seven indicators of teaching performance measured, Social Studies teachers were described as very satisfactory. Using regression analysis, the results of the study proved that technology integration exerted a significant impact on teaching performance. And among the six dimensions of technology integration, the best predictor was productivity and professional practice. Harris, Mohammed and Adel (2016) found that technology integration could be a factor in student academic achievement and motivation at school if it is properly utilized. These findings are important due to the technological shift that schools are currently facing. With more technology exposure for students and more professional development for teachers to hone their newly acquired teaching methods, technology may be the catalyst needed for schools to enhance their teachers' professional skills and help students achieve at higher levels. Nasir (2019) also found that the relationship between the integration of emerging technology and teaching performance and how modern technology support quality in education. The study also found that management's ability to formulate and implement policies for the provision of instructional materials for teaching and learning has a major role and leads to quality improvement.

Statement of the Problem
University education is established by law to render sustainable academic services to students, staff and the general public. But a critical observation by the researcher in public Universities in Cross River State revealed poor academic service delivery among lecturers. Some lecturers seem not to deliver quality lectures to students. There appears that some academic staff do not effectively structure their lecture content with clear objectives to stimulate students' interest towards learning. Some lecturers cannot establish a positive classroom environment with disciplinary measures for effective teaching and learning. It seems that some academic staff do not organise their materials in a way student can understand the information or ideas. There are observable delays in completion in research project/thesis/dissertations writing and defense owing to students' dissatisfaction with the supervision processes and poor student-supervisor relationships.

Academic staff poor service delivery has degenerated to delay in releasing students' results, prolonging graduation periods for final year students and denying students their right of knowledge of their academic standing at the end of the semester or session. Worse still, the conduct of assessment to measure academic progress in some cases has been strictly confined to the dictates of students. These anomalies have culminated to students' examination failures, course carry overs and involvement in examination malpractices, probations, skipping of class assignment/group work, poor concentration, irregular attendance to classes, missing examinations, dropout of school, prolonging prescribed maximum course duration, and other attendant academic problems.

However, poor academic service delivery among lecturers is unacceptable because it contributes in bringing down the prestige of the tertiary institutions and limiting it from achieving its mandate. The Government and other NGOs in an attempt to improve academic service delivery organized Information and Communication Technology (ICT) retraining and quality assurance programmes for lecturers among others. Yet the problem of academic staff poor service delivery persists as it has affected the quality of graduates produced from tertiary institutions yearly, as well as the economic productivity of Nigeria in general. Poor management of tertiary institutions with

emerging technologies may likely contribute to poor quality of service delivery among lecturers. The researcher is worried about the trend, hence this study. This addresses the question thus: To what extent does managing tertiary education with emerging technologies predicts academic service delivery among lecturers in tertiary institutions in Cross River State of Nigeria?

Purpose of the study
The study investigated the extent managing tertiary education with emerging technologies and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State Public Universities, Nigeria. Specifically, the study sought to find out how:
i. Virtual reality relates to academic service delivery during post COVID-19 Pandemic era
ii. Augmented reality relates to academic service delivery during post COVID-19 Pandemic era

Research hypotheses
1. Managing virtual reality does not significantly relate to quality service delivery among academics during post COVID-19 Pandemic era in Cross River State.
2. There is no significant relationship between managing augmented reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State.

Methodology
The study adopted correlational survey research design. Correlational survey research is a method of descriptive research that is used for collecting primary data based on verbal or written communication with a representative sample of individuals or respondents from the target population. The population of the study comprised 4,772 staff from two public Universities in Cross River State, Nigeria. Stratified and proportionate sampling technique was used to sample 400 academic staff and used for the study. The instrument used for data collection was questionnaire titled: Managing University Education with Emerging Technologies and Quality Service Delivery Survey (MUEETQSDS). The questionnaire had sections 'A' which dealt with the instruction for respondents. Section 'B' contained questionnaire items of quality service delivery based on a four Likert type scale of Strongly Agree (SA)=4, Agree (A)=3 Disagree (D)=2 and Strongly Disagree (SD)=1 with reliability of 0.91. The questionnaires were administered on the respondents from the two sampled Universities using three research assistants who were chosen from the sampled institutions. The data generated were analyzed using Pearson product moment correlation statistic and the null hypotheses were tested at .05 level of significance.

Presentation of results
Hypothesis 1: Managing virtual reality does not significantly relate to quality service delivery among academics during post COVID-19 Pandemic era in Cross River State.
Table 1: Pearson product moment correlation analysis of the relationship between managing virtual reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State (N=400)

Variables	N	X	S.D	Df	r-cal	p-val
Managing virtual reality (X_1)	400	13.6951	2.30362			
Teaching delivery (Y_1)	400	12.0041	2.49162	398	.489*	.000
Research publication (Y_2)	400	12.2398	2.74111	398	.403*	.000
Project supervision (Y_3)	400	11.6260	3.68316	398	.289*	.000

*p<.05, Critical value=0.388

The independent variable in this hypothesis is managing virtual reality while the dependent variable is quality service delivery assessed from three perspectives which are teaching delivery, research publication and project supervision. The variables were measured continuously. To this hypothesis, Pearson product moment correlation was used and the result showed that for managing virtual reality and teaching delivery (r= .489*, p<.05), for managing virtual reality and research publication (r=.403*, p<.05) and for managing virtual reality and project supervision (r=.289*, p<.05). A cursory look at the p-values shows that p(.000) is less than p(.05) for the three dimensions. This implies that there is a significant relationship between managing virtual reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State for the three dimensions assessed. Hence, the null hypothesis is rejected. The result is presented in Table 1.

Null Hypothesis 2: There is no significant relationship between managing augmented reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State.

The independent variable in this hypothesis is managing augmented reality while the dependent variable is quality service delivery assessed from three perspectives which are teaching delivery, research publication and project supervision. The variables were measured continuously. For the three dimensions assessed. The result is presented in Table 2.

Table 2: Pearson product moment correlation analysis of the relationship between managing augmented reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State (N=400)

Variables	N	Mean	Std. Dev	df	r-cal	p-val
Managing augmented reality (X_1)	400	12.1260	2.57388			
Teaching delivery (Y_1)	400	12.0041	2.49162	398	.411	.000
Research publication (Y_2)	400	12.2398	2.74111	398	.373	.000
Project supervision (Y_3)	400	11.6260	3.68316	398	.171	.004

*p<.05, Critical value=0.388

To this hypothesis, Pearson product moment correlation was used and the result showed that for managing augmented reality and teaching delivery (r= .411*, p<.05), for managing augmented reality and research publication (r=.373*, p<.05) and for managing augmented reality and project supervision (r=.171*, p<.05). A cursory look at the p-values shows that p (.000) is less than p (.05) for the three dimensions evaluated. This implies that there is a significant relationship between managing augmented reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State for the three dimensions assessed. Hence, the null hypothesis is rejected

Discussion of findings
One of the findings of this study revealed that there is a significant relationship significant relationship between managing virtual reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State. The implication of this finding is that the more effort school management would put in managing virtual reality the more quality would be observed in the service delivery of academics and vice versa. This finding is in tandem with that of Cheng

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(2021) who found that Virtual Reality technology is a suitable tool for teaching high school mathematics, when it combined with the tradition curriculum were well-received and facilitate effective learning. In addition, the desktop-based VR system is found to be superior to the all-in-one VR system in terms of learning effectiveness since the high-efficiency display and better control. The finding of this study is equally in tandem with that of Mike and Wang (2017) which showed significant effects of exploratory education on creativity, the optimal creativity promoted by exploratory education with virtual reality, remarkable effects of exploratory education on leadership, and the optimal leadership enhanced by exploratory education with virtual reality.

The second finding of this study revealed that there is a significant relationship between managing augmented reality and quality service delivery among academics during post COVID-19 Pandemic era in Cross River State. The implication of this finding is that the more effort school management would put in managing augmented reality the more quality would be observed in the service delivery of academics and vice versa. This finding is in agreement with that of Hakan and Hazmin (2021) who found that students' achievement and attitudes towards the science course increased significantly with Augmented Reality (AR) based applications. It is also in congruence with Johnson and Jacques (2019) found that using an augmented reality mobile application increased the quality-of-service delivery of academics and learning motivation of students. The attention, satisfaction, and confidence factors of motivation were increased, and these results were found to be significant.

Conclusion
Emerging technologies are technologies whose development, practical applications, or both are still largely unrealized, such that they are figuratively emerging into prominence from a background of nonexistence or obscurity. Emerging technologies are often perceived as capable of changing the status quo. If they are effective provided and managed in the school system, they are mostly to enhance the quality-of-service delivery among academics for students' learning enrichment.

Recommendations
Based on the outcome of the study, the researcher recommends the following:
i. Educational institutions should formulate flexible policies that would encourage the integration of emerging technologies in teaching and learning process.
ii. There should be a periodic training and retraining of academic staff to update their knowledge on learning technologies. Similarly, educational institutions should establish department of Learning Technologies to enhance innovations and research on education technology
iii. Educational institutions should ensure the provision of relevant infrastructures to facilitate the adoption and integration of emerging educational technologies. Also, there should be an increased budgetary allocation for educational institutions to improve their capacity to acquire, implement, upgrade and maintain emerging technologies.

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