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Challenges and Successes of Virtual Learning: An Emerging Trend

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Abstract

The Covid-19 pandemic led to a cessation of academic activities in public tertiary institutions and other schools in the world including Nigeria. A new reality of online education dawned on the academic system. This research assessed the challenges encountered by students who attended online lectures during the Covid-19 pandemic in Nigeria. Three classes each were organized using the video conferencing software for students of the Department of Optometry, University of Benin. They were then to freely assess the classes as well as the Lecturer and observe the challenges and successes. An online survey which was used to collate and populate the responses obtained during the study was analysed.Ninety Six (96) Optometry students responded to the questionnaire. Statistical analysis showed that Online lectures significantly improved students' knowledge of the coursework. The challenges included epileptic power supply, absence of internet data, and lack of motivation among students.

Keywords: Covid-19, Pandemic, Online Education, Optometry, Google Forms.

Introduction

Nigeria currently runs almost a wholly in-person based public tertiary education system which comprises of universities, colleges of education, polytechnics, monotechnics and trade/proffesional schools. With a population of over 200 million, Nigeria has the largest population in Africa (Akinyemi and Isiugo-Abanihe, 2014).

The Covid-19 Virus was first reported in December 2019 (Chen *et. al.*, 2020). Beginning from the 19th of March 2020, the Nigerian government ordered a shutdown of all schools to safeguard the health of the public including students (Nlebem, 2020). That posed a novel challenge to the tertiary education system as

academic years were not fully synchronized across institutions. While some schools were in session, others were on holidays.

It rapidly becomes clear that to combat a novel situation, academic innovation is necessary. Online lectures have existed for a very long time in other climes. Oblinger and Oblinger (2005) defined online learning as a learning process that is wholly online based. Other authors defined online learning as any learning process that involves some technology where learners were in different physical locations (Carliner, 2004; Benson, 2002).

As early as the 1990s, online learning was ongoing in South African tertiary insitutions (Ravjee, 2007). Clinical students had reported the positive effects of online learning (Mohamed & Peerbhay, 2012). A study by Cloete *et. al.* (2009) showed that learning via social networks like Facebook allowed easier integration of academic activities into daily routines, better inter-student discussion opportunities and even gave students the opportunity to ask questions they would never have asked in the physical classroom.

Unfortunately, while the private schools in Nigeria across all levels have quickly embraced online learning as an alternative to physical classroom learning, the public institutions have not been so enthusiastic about it. This paper assessed the successes and challenges encountered by students who attended online lectures during the Covid-19 pandemic in Nigeria.

Materials and Methods

The Null Hypothesis (H_o) was that there was no difference in the knowledge students reported before and after the Online Lectures.

This study was a prospective, cohort one. The population comprised students of the Department of Optometry. The Department currently has 764 students. The sampling technique used was a stratified random sampling.

The population of students in the University of Benin Department of Optometry was less than 10000. Hence Fisher's formula for sample size calculation was used thus:

$n = Z^2P(1-P)/I^2$

where n = Sample size, Z = Normal deviation at the desired confidence interval (Confidence interval 95%, Z = 1.96), P = population of population with the desired characteristic and I = degree of precision (10% chosen). Since specific proportions were not known, 50% was used.

Hence n = 96.

The Google forms online suite was used to create an electronic survey sent to students. The responses were collated by the Google forms service and securely

sent to the authors. Each student could only fill the form once. The survey consisted of three sections:

i. Demographics ;
ii. Students' views on courses taken and online education; and
iii. Students' suggestions.

Online surveys have been reliably used to assess the experience of attendees of virtual education sessions (Tenforde *et. al.,* 2020, Vigersky *et. al.,* 2020). The study was carried out with adherence to the Declaration of Helsinki (World Medical Association, 2013). Participants also had to check off a consent segment before proceeding to fill the online survey.

The authors were lecturers from the University of Benin, Edo State, and the University of Medical Sciences in Ondo State. The students were also given the unique opportunity to interact with industry experts in the particular fields of study taught. That was possible due to the dynamic abilities of the online lecturers who that allowed local and international experts to contribute online after the daily lectures.

Series of online based lectures were carried out between April and June, 2020 to cover the coursework syllabi of five (5) courses offered by Optometry students. The lectures consisted of online classes, social media (Whatsapp and e-mail) discussion and web based personal interactions with Lecturers. Five courses denoted Course A, Course B, Course C, Course D and Course E were surveyed during this study.

The students were not made aware that a study was being conducted until the end of the lectures when they received emails and messages via social media seeking their consent and responses to the questions raised.

The respondents were asked to rate how much effort they put had into the courses. They were required to select one of Poor, Fair, Satisfactory, Very Good or Excellent. A score of 1 was allocated to Poor, 2 to Fair, 3 to Satisfactory, 4 to Very good and 5 to Excellent.

It was observed that some students took online courses for more than one academic level. Such students were either retaking the course after failing it earlier or were taking the course for the first time after dropping it in previous year(s). Therefore, students were also asked to assess themselves on how much effort they had put into the online lectures generally.

A Paired T-Test was used to compare students' self-assessment of their knowledge of the courses before and after the online classes.

Results

A total of 96 students responded to the survey. 63(65.6%) were females while 33(34.4%) were males. 76 (79.2%) respondents reported that they were able to attend the lectures fully or in part while 20 (20.8%) respondents reported that they were not able to attend the lectures.

27(28.1%) students could not participate fully or did not participate at all, and their reasons were shown in table 1.

Table 1: Reasons for not participating

S/N	Items	Responses
1	Lack of data only	12 (12.5%)
2	Poor power situation only	4 (4.2%)
3	Distraction from family only	3 (3.1%)
4	Network issues only	2 (2.1%)
5	Lack of Interest only	1 (1%)
6	No smart phone only	1 (1%)
7	Poor power situation, distractions and data problems	1 (1%)
8	Network Issues and distractions from family	1 (1%)
9	All of the above	1(1%)
	Total :	27

Course A was attended by 38(39.6%) respondents, Course B had 12 (12.5%) respondents attending, Course C had 25 (26%) respondents attending, Course D had 16 (16.7%) respondents attending while Course E had 31 (32.3%) respondents attending.

The assessment of the virtual courses was compiled and then shown in Table 2 below.

Table 2: Students Self-assessment of efforts put into respective Online Courses

	Course A	Course B	Course C	Course D	Course E
Poor	1 (2.6%)	1 (5.3%)	2 (8.7%)	1 (3.45)	3 (8.2%)
Fair	20 (51.3%)	7 (36.8%)	9 (39.1%)	12 (41.4%)	11 (29.7%)
Satisfactory	10 (25.6%)	6 (31.6%)	7 (30.4%)	7 (24.1%)	10 (27%)
Very Good	5 (12.8%)	3 (15.8%)	3 (13%)	6 (20.7%)	8 (21.6%)
Excellent	3 (7.7%)	2 (10.5%)	2(8.7%)	3 (10.3%)	5 (13.5%)
Totals	39 (100%)	19 (100%)	23 (100%)	29 (100%)	37 (100%)

7(7.3%) students reported that the efforts they put in were poor, 35(36.5%) reported fair, 37(38.5%) reported Satisfactory, 13(13.5%) reported Very Good and 4(4.2%) reported that they put in excellent efforts.

The respondents also rated the impact of the Online lectures on their knowledge of the respective courses. They were asked to select only one of Poor, Fair, Satisfactory, Very Good and Excellent; which represented scores on a scale of 1,2,3,4 and 5 respectively. Their scores which were shown in table 3 were statistically tested by comparing them before and after the Online lectures.

As observed from the results shown in Table 3, the p-value was less than our significance level $\alpha = 0.05$, and as such, the Null Hypothesis was rejected. Hence, there was a statistical difference between the knowledge reported before and after the virtual learning. The mean also indicated an improvement.

Table 3: t-Test: Paired Two Sample for Mean

		Knowledge Before	Knowledge after
Mean		2.395833333	2.802083333
Variance		1.125877193	1.255153509
Observations		96	96
Hypothesized Difference	Mean	0	
Df		95	
t Stat		-3.220126427	
P(T<=t) two-tail		0.001754462	
t Critical two-tail		1.985251004	

The respondents were also asked to rate the contribution of the course contents for quality and quantity. The results were displayed in Table 4.

Table 4: Students' response to the quality and quantity of course contents

S/N		
1	Learning objectives were clear	Strongly Disagree (1%) Disagree (7.3%) Neutral (26%) Agree (53.1%) Strongly Agree (12.5%)
2	Course content was organized and well planned	Strongly Disagree (1%) Disagree (10.4%) Neutral (30.2%) Agree (41.7%) Strongly Agree (16.7%)

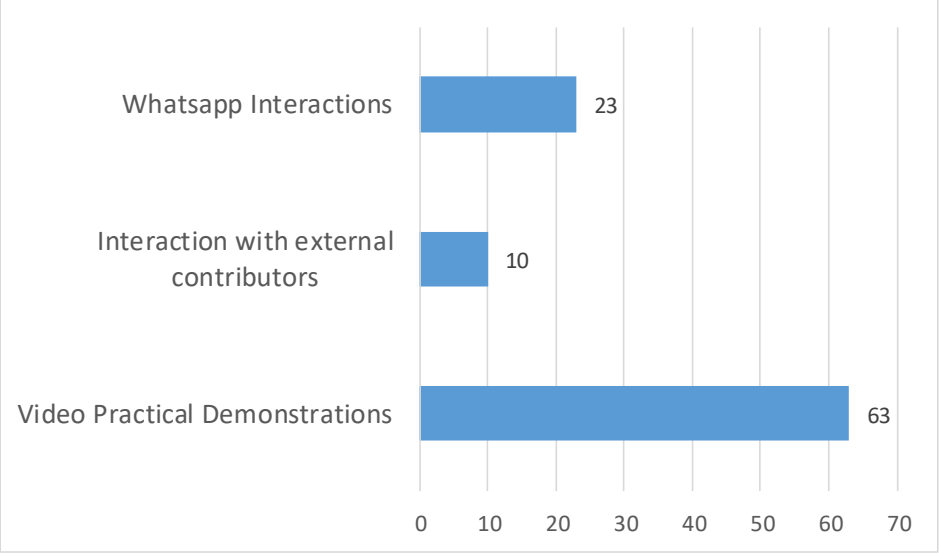
3	Course workload was appropriate	Strongly Disagree (4.2%) Disagree (5.2%) Neutral (30.2%) Agree (47.9%) Strongly Agree (12.5%)
4	Students could participate fully	Strongly Disagree (5.2%) Disagree (12.5%) Neutral (30%) Agree (41.7%) Strongly Agree (16.7%)

Finally students were required to indicate what part of the online lectures they found most valuable. The video practical demonstrations (65.6%) were the most common item selected by the respondents.

Table 5: Most valuable aspect of virtual learning as selected by the Students

	n
WhatsApp Interactions	23
Interaction with external contributors	10
Video Practical Deminstrations	63
n=	96

Fig. 1. Students most valuable aspect of online lectures



Discussion

As the world slowly returns to everyday activities, it has become evident that changes must be made to the mode of carrying out our activities, including education. Virtual learning shows promise due to its independence on locations and time (Fay et.al., 2019). Electric power supply, internet services and an internet enabled device are minimum requirements for this. The lack of data access was the most common (12.5%) reason mitigating against online lectures, according to the respondents. Some of the students did not have funds to get data. A second group of students did not have good reception despite purchasing data while a third group did not have access to an internet capable phone. The second most common mitigating factor was poor power supply (4.2%).

In physical learning, the Lecturer easily to assesses student participation and effort on the go. While techniques are available to do this electronically, virtual learning requires a lot of individual effort from the student (Mogus et. al.). Table 2 showed that students averagely put in satisfactory effort (Course A: 2.7± 0.99, Course B: 2.9 ±1.1, Course C: 2.7 ±1.1, Course D: 2.9 ±1.1, and Course E: 3.0 ±1.2) into the Online courses while acknowledging that they would do better. There was a significant improvement in students' knowledge after the online classes ($p<0.05$), showing that virtual learning is a viable alternative for academic activities.

Students responded that the online learning satisfied the course outline in quantity and quality as they most likely responded neutral or in agreement. Students however, did not put in their best efforts into the online classes as majority of the respondents reported that they only put a fair effort. That might have been due to the foreknowledge the students had that the online course in this study would not count in their final grades for the semester.

Out of the three forms of learning used during the classes, the respondents felt that the online video demonstrations were the most preferred (65.6%) form of learning as against interaction with external contributors (On whatsapp) which had the least score at (10.4%).

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