



CHALLENGES OF VIRTUAL TEACHING AND LEARNING IN POST COVID-19 PANDEMIC ERA

¹**Florence Oluchi Nnaji**

olunna20@yahoo.com 07064815343

Department of Office Technology and Management
School of Business and Management Technology The
Polytechnic Bali, Taraba State

²**Bibiana Ngozi Nwabuo (Ph.D.)**

Department of Business and Entrepreneurship Education,
Kwara State University Malete

Abstract

The paper investigated challenges of virtual teaching and learning in post covid-19 pandemic era. Two research questions were answered while two null hypotheses were tested at 0.05 level of significance. The descriptive survey research design was adopted for the study. The population of the study comprised 61 lecturers from the five departments of the school of business and management technology, Federal Polytechnic Bali. Sampling was not applied since the population was sizeable to handle. Data for the study was collected using a questionnaire structured on a 4-point rating scale of Strongly Agree, Agree, Disagree and Strongly Disagree with corresponding values of 4, 3, 2, and 1 respectively. The structured questionnaire with 19 items was titled Challenges of Virtual Teaching and Learning Questionnaire (CVTLQ). It was validated by three experts from the school of business and management technology, Federal Polytechnic Bali. Cronbach Alpha procedure was used to determine the internal consistency of the instrument and it yielded a reliability coefficient of 0.79. The 61 copies of the questionnaire were distributed to the respondents, however, only 59 copies were retrieved and used for the study. Mean and standard deviation were used to analyse the data collected on the research questions, while t-test was used to test the hypotheses. The findings of the study identified 11 challenges and 8 solutions of virtual teaching and learning in post covid-19 era. There were no significant differences in the mean ratings of lecturers on 14 out of 19 items, whereas, there were significant differences in the mean ratings of lecturers on the remaining 4 items. The study among others recommended that Management of institutions should provide functional standby generating plant to enhance and ensure stable electric power supply to avoid interruption of lectures when using virtual teaching and learning approach.

Keywords: Challenges, Virtual, Teaching, Learning and covid-19.

Introduction

Challenges post by Corona Virus Disease 2019 (COVID-19) in the educational system is enormous. This is because most institutions of learning in Nigeria has been paying lip service to online teaching and learning system. COVID-19 exposed the weaknesses of Nigerian education system towards adoption of new technologies. When the minister of education after series of meeting with educational stakeholders announced that educational institutions should use virtual teaching and learning during the covid-19 lock down to attend to students, it was only view institutions both in the private and public sector in Nigeria that was able to do that. This made many Nigerian students to be at home for the period of six months without academic activities. Many Nigerians including students, teachers and parents felt the impact, though it was mostly felt by students who had to struggle with academic activities especially as many students wrote examination immediately after the pandemic. The post covid-19 challenges is what is left to be addressed by the government and management of educational institutions in the case of educational system. Covid-19 has made the whole world realise that life and living can take a different shape in a twinkle of an eye, change is a necessary phenomenon therefore, the need to plan for such unforeseen circumstance (s).

Virtual teaching and learning is the process of using technologies such as computer system, internet, zoom and other technologies in the teaching and learning process. Teaching and learning with new technologies application has become important instructional process to enhance accessibility, efficiency and quality of teaching and learning by facilities access to resources and services as well as improve remote exchange and collaboration (Amiaya, 2016). Onojetah & Utoware (2019) assert that the relevance of new technologies in the teaching and learning process, Nigeria has promised to provide facilities and necessary infrastructure for the promotion of new technologies application at all levels of education system, business education in the universities inclusive. A virtual classroom is an online learning environment that allows teachers and students to communicate, interact, collaborate, and explain ideas. A virtual classroom enables students to access quality teachers anywhere on the planet so long as they both have a reliable internet connection. Racheva (2017) describes virtual learning as a learning experience that is enhanced through utilizing computers and/or the internet both outside and inside the facilities of the educational organization. The instruction most commonly take place in an online environment. The author stressed that the teaching activities are carried out online whereby the teacher and learners are physically separated (in terms of place, time, or both). She maintained that distance learning conducted in a virtual learning environment uses electronic study content designed for self-paced (asynchronous) or live web-conferencing (synchronous) online teaching and tutoring. *Virtual learning is defined as learning that can functionally and effectively occur in the absence of traditional classroom environments (Simonson & Schlosser, 2016).*

The post covid-19 challenges in virtual teaching and learning is similar to the challenges of new technologies experienced by educationists in the educational system. Plitnichenko (2020) states that although technology evolution now allows many things we have not believed possible, the shift to e-learning does not go as smoothly as we want it to

be. Facing the pitfalls of digital learning may be discouraging and frustrating both for teachers and students. Onojetah & Utoware (2019) suggest that the challenges of new technology application has led to learners not being adequately exposed to those experiences that will guarantee the total development of their being in the e-world. Ugonu (2019) states that challenges of new technology include among others: epileptic electric power supply. She maintained that epileptic nature of electric power supply and also the high cost of running standby generator is a challenge to virtual learning. According to Oyadongham & Eke (2011) for the past fifteen years, Nigeria has been having difficulties in providing stable and reliable electricity supply to every nook and cranny of the country without success. Constant power failure may constitute a problem to the teachers because this instructional equipment cannot function without electricity. Poor internet network service is another problem that hinders the progress and growth of the use of virtual teaching and learning. Internet service in developing country like Nigeria is poor and sometimes frustrating. One of the major challenges the internet users especially business educators are facing is the incessant interruption of the internet network services. The author buttressing this point maintained that many a time, when there is need for the use of new technologies such as internet for browsing and other things the network may either be slow or not available.

Another challenge is that many teachers and lecturers are not ICT compliant, therefore, cannot use ICT in the preparation of lessons and during lessons. Nagel (2013) collaborates this view by saying that the key among all the challenges in the use of new technologies in teaching and learning business education programmes is lack of suitable professional development for business educators who are required to integrate the new technologies into classroom practices. Okoli & Wagbara (2016) upheld that there is dearth of trained teachers for e-learning. This is the reason why Bongotus & Onyenwe (2010) opine that there are business teacher educators available, they lack pre-requisite ICT competency and this hinders the ability to effectively direct teaching and learning. Funding is another challenge for virtual teaching and learning in the post covid-19 era. Iyiola (2013) advanced that inadequate funding of business education programmes leads to lack of ICT infrastructure. The author states that where there is inadequate ICT infrastructure for the teaching of students, they do more of theory than practical which may not enable them to be highly competitive in the labour market. Plitnichenko (2020) confirmed that challenges of virtual learning in post covid-19 era include: organization of work processes and time management: The teachers are supposed to move their classes online having no additional training and extra budget. The author stressed that many schools are not prepared for moving classes online. In this situation, the burden is put on teachers to adapt themselves and their student s to a new way of learning. Gadgets shortage and crashing systems is another challenge since not every student and teacher has a personal gadget to use for online learning. Another problem everyone face is a computer crash that usually happens at the most unexpected moment.

Plitnichenko maintained that millions of people around the world are experiencing technical difficulties because of the high usage rate of online learning systems. Internet connection is either unstable or the current data plan is not enough to cover the progressive

e-learning needs. Teachers are trying to manage the bad internet connection during the online lessons. The solution to connectivity is calling your provider and seeking advice as well as upgrading your current Internet plan. Computer literacy is another challenge to online teaching and learning. It is hard for teachers and students to start using a learning management system or any other digital tool out of nowhere without additional training. An additional class of computer literacy for both teachers and students can be a solution. Security: virtual teaching and learning in post covid-19 is a fertile ground for cyber criminals, unleashing the wave of cyber-attacks. The user should be careful about the data disclosed on the Internet. It is advisable not to use suspicious websites and applications and to be attentive when opening emails from unknown persons and update your software regularly. Lack of interaction: During the online lectures, it is hard to keep students engaged without a teacher's physical presence and face-to-face contact. For instance, science labs (physics, chemistry, etc.), it is impossible to put into practice without in-person instructions. It is important to ensure constant contact and tracking the progress and giving feedback to students is another step to keeping each student engaged.

Challenges of covid-19 remains even after covid-19 pandemic. Education industry has to face another side of it, which seems difficult to solve due to numerous challenges that must be defeated before its workability. Covid- 19 pandemic brought into play the reality of virtual activities such as virtual meeting, virtual conference and virtual teaching and learning. Virtual teaching and learning is a technological advancement that has been welcomed world-wide even though many institutions have not fully keyed into it due to the challenges involved. It is observed that many educational institutions lack the necessary technological resources needed for virtual teaching and learning. According to Nagel (2013) even though new technologies have been accepted world-wide in almost every aspect of education, some challenges are preventing the effective implementation. Challenges such as lack of professional development among educators who are the implementers of the virtual teaching and learning is very significant. Therefore, the study focused on the challenges of virtual teaching and learning in post covid-19 pandemic era.

Research Questions

The following research questions guided the study:

1. What are the challenges of virtual teaching and learning in post covid-19 era?
2. What are the solutions to the challenges of virtual teaching and learning in post covid-19 era?

Hypotheses

Two null hypotheses were formulated and tested at 0.05 level of significance.

1. There is no significant difference in the mean responses of male and female lecturers of school of business and management technology on the challenges of virtual teaching and learning in post covid-19 era.
2. There is no significant difference in the mean responses of male and female lecturers of school of business and management Technology on the solutions to the challenges of virtual teaching and learning in post covid-19 era.

Methods

Descriptive survey research design was adopted for the study. The area of the study was The Polytechnic Bali, Taraba State. The population of the study comprised 61 lecturers in the five departments of School of Business and Management Technology, The Polytechnic Bali. Sampling was not applied since the population was sizeable to handle. An instrument titled challenges of virtual teaching and learning questionnaire (CVTLQ) was used to collect data for the study. The 19-items questionnaire was structured on a four points rating scale of Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagreed (SD) weighted as 4, 3, 2, and 1 respectively. The questionnaire was validated by three experts from the School of Business and Management Technology, The Polytechnic, Bali. Cronbach Alpha procedure was used to determine the internal consistency of the instrument and it yielded a reliability coefficient of 0.79. A total number of 61 copies of the questionnaire were administered to lecturers in the school by one of the researchers and a research assistant. Out of the 61 copies of the questionnaire distributed 59 copies which represent 98% of the distributed questionnaire were retrieved and used for the study. Mean and standard deviation were used to analyse the data collected on the research questions, while t-test statistics was used to test the hypotheses at 0.05 level of significance. The decision rule was based on the principle of upper and lower limit of the mean score.

Response Options	Point	Real Limit of Numbers
Strongly Agreed (SA)	4	3.50 - 4.00
Agreed (A)	3	2.50 - 3.49
Disagreed (D)	2	1.50 - 2.49
Strongly Disagreed	1	1.00 - 1.49

The null hypothesis was rejected if the p-value was more than the t-value while the hypothesis was accepted if the p-value was less or equal to the t-value.

Results

Research Question 1:

What are the challenges of virtual teaching and learning in post covid-19 era?

Table 1: Mean ratings of male and female lecturers of School of Business and Management Technology on the challenges of virtual teaching and learning in post covid-19 era

S/N	Challenges of virtual teaching	X_M	X_F	X_G	SD_G	Remarks
1.	Poor internet service	3.26	3.18	3.22	0.89	Agree
2.	Epileptic electric power supply	3.47	3.49	3.48	0.83	Agree
3.	Lack of professional development	3.77	3.41	3.59	0.72	Strongly Agree
4.	Computer literacy	3.57	3.30	3.43	0.84	Agree
5.	Cyber-attacks	3.28	3.34	3.31	0.60	Agree
6.	Connectivity	3.26	3.18	3.22	0.68	Agree
7.	Organization of work processess	3.67	3.82	3.74	0.53	Strongly Agree
8.	Lack of interaction	3.52	3.49	3.50	0.89	Strongly Agree
9.	Cost of running standby generator	3.35	3.33	3.34	0.86	Agree
10.	Inadequate funding	3.78	3.63	3.70	0.61	Strongly Agree
11.	Use of new technologies	3.76	3.40	3.58	0.74	Strongly Agree

Key: X_M = Mean of Male; X_F = Mean of Female; X_G = Grand mean; SD = Standard Deviation; Number of Respondents (59); **SA**= Strongly Agreed; **A** = Agreed;

Table 1 shows that the grand mean ratings of responses of respondents on 6 items out of the 11 identified items range from 3.22 to 3.48 which are within the boundary limit of 2.50 to 3.49 on a 4-point rating scale. This indicates that the respondents agreed that the 6 identified items in the table are the challenges of virtual teaching and learning in post covid-19 era. The grand mean ratings of responses of respondents on the remaining 5 items in the table, that is, 3, 7, 8, 10 and 11 were within the boundary limit of 3.50 to 4.00 respectively on a 4-point rating scale. This implies that the respondents strongly agreed that the remaining five items in the table are challenges of virtual teaching and learning in the post covid-19 era. The standard deviation values for the 11 items were between 0.53 to 0.89 which indicate that the responses of the respondents are close to the mean and one another.

Research Question 2:

What are the solutions to the challenges of virtual teaching and learning in post covid-19 era?

Table 4: Mean ratings of male and female lecturers of School of Business and Management Technology, on the solutions to the challenges of virtual teaching and learning in post covid-19 era.

S/N	Solutions to the challenges	\bar{X}_M	\bar{X}_F	\bar{X}_G	SD	Remarks of virtual teaching
1.	Computer literacy class for both teachers and students	3.13	3.22	3.17	0.81	Agree
2.	Provision of funds for the purchasing of ICT machines and equipment and for maintenance	3.45	3.45	3.45	0.72	Agree
3.	Providing stable and reliable electricity	3.26	3.17	3.21	0.67	Agree
4.	Seeking advice from internet providers and upgrading to current internet plan	3.63	3.52	3.58	0.65	Strongly Agree
5.	Lecturers should update their ICT knowledge	3.27	3.33	3.30	0.60	Agree
6.	Users should be careful about data disclosed on internet and avoid suspicious websites and plans	3.80	3.49	3.64	0.52	Strongly Agree
7.	Constant contact and tracking of student progress and feedback	3.34	3.38	3.36	0.71	Agree
8.	Mobile Guardian, a Google building partner to offer the right edtech tools to teachers to assist them connect	3.77	3.41	3.59	0.72	Strongly Agree

Key: \bar{X}_M = Mean of Male; \bar{X}_F = Mean of Female; \bar{X}_G = Grand mean; **SD** = Standard Deviation; Number of the Respondents (59); **SA** = Strongly Agreed; **A** = Agreed.

Table 2 shows that the grand mean ratings of responses of respondents on 5 items out of the 8 identified items, range from 3.17 to 3.45 which are within the boundary limit of 2.50 to 3.49 on a 4-point rating scale. This indicates that the respondents agreed that the 5 identified items in the table are the solutions to the challenges of virtual teaching and learning in post covid-19 era. The grand mean ratings of responses of respondents on the remaining 3 items in the table, that is, 4, 6 and 8, were within the boundary limit of 3.50 to 4.00 respectively on a 4-point rating scale. This implies that the respondents strongly agreed that the remaining 3 items in the table are solutions to the challenges of virtual teaching and learning in the post covid-19 era. The standard deviation values for the 8 items are between 0.52 to 0.81 which indicate that the responses of the respondents are close to the mean and one another.

Hypothesis 1:

There is no significant difference in the mean responses of male and female lecturers of school of business and management technology on the challenges of virtual teaching and learning in post covid-19 era.

Table 3: Summary of Two Tailed t-test analysis of male and female lecturers of school of business and management technology on the challenges of virtual teaching and learning in post covid-19 era

Group	N	X	SD	α	Df	t-val	p-val	Decision
Male	41	3.43	1.14	0.05	57	0.60	0.54	NS
Female	18	3.36	0.82					

The hypothesis test in Table 3 revealed that the mean ratings of male and female lecturers of school of business and management technology on the challenges of virtual teaching and learning in post covid-19 era is 3.43 and 3.36 respectively while the corresponding standard deviation is 1.14 and 0.82. T-value is 0.60 at degree of freedom of 57 while the p-value is 0.54. Testing at alpha value 0.05, the p-value is not significant, since the p-value is greater than the alpha value of (0.05). Therefore, the null hypothesis is not rejected; hence, the mean responses of male lecturers in the school of business and management technology do not significantly differ from that of the female lecturers on the challenges of virtual teaching and learning in post covid-19 era.

Hypothesis 2:

There is no significant difference in the mean responses of male and female lecturers of school of business and management technology on the solutions to the challenges of virtual teaching and learning in post covid-19 era.

Table 4: Summary of Two Tailed t-test analysis of male and female lecturers of school of business and management technology on the solutions to the challenges of virtual teaching and learning in post covid-19 era.

Group	N	X	SD	α	Df	t-val	p-val	Decision
Male	41	3.45	0.66	0.05	57	0.50	0.25	NS
Female	18	3.28	0.70					

Data in Table 4 indicate that the aggregate mean ratings of lecturers in of school of business and management technology on the solutions to the challenges of virtual teaching and learning in post covid-19 era is 3.45 and 3.28 respectively, while the corresponding standard deviation is 0.66 and 0.70. Test of hypothesis in Table 6 indicated that t-value is 0.50 at degree of freedom of 57, while the p-value is 0.25. Testing at alpha level of 0.05, the p-value is not significant since the p-value is greater than the alpha value of (0.05). Therefore, the null hypothesis is not rejected; hence, the mean responses of male lecturers of school of business and management technology do not significantly differ from that of the female lecturers of the school on the solutions to the challenges of virtual teaching and learning in post covid-19 era.

Discussion of Findings

The findings of the study according to research question one showed that respondents agreed on the eleven items as the challenges of virtual teaching and learning in post covid-19 era. Some of the identified challenges include; Poor internet service, epileptic electric power, supply, lack of professional development, computer literacy, cyber-attacks, connectivity, organization of work processes, lack of interaction, cost of running, standby generator, Inadequate funding and use of new technologies. The result of the study implies that there are lot of challenges to virtual teaching and learning in the post covid-19 era. The findings are in line with the findings of Onojetah & Utoware (2019) who found that the challenges of new technology application has led to learners not being adequately exposed to those experiences that will guarantee the total development of their being in the e-world. Nagel (2013) and Okoli & Wagbara (2016) collaborate these views by saying that the key among all the challenges in the use of new technologies in teaching and learning business education programmes is lack of suitable professional development for business educators who are required to integrate the new technologies into classroom practices and that there is dearth of trained teachers for e-learning. Bongotus & Onyenwe (2010) affirmed the findings by saying that there are business teacher educators available, they lack pre-requisite ICT competency and this hinders the ability to effectively direct teaching and learning.

The study identified solutions to the challenges of virtual teaching and learning in post covid-19 era to include; computer literacy class for both teachers and students,

provision of funds for the purchasing of ICT machines and equipment and for maintenance, providing stable and reliable electricity, seeking advice from internet providers and upgrading to current internet plan, lecturers should update their ICT knowledge, users should be careful about data disclosed on internet and avoid suspicious websites and plans, constant contact and tracking of student progress and feedback, Mobile Guardian, a Google Build partner to offer the right edtech tools to teachers to assist them connect. The findings supported that of Plitnichenko (2020) who reported that teachers should be careful about the data disclosed on the Internet, there are many ways to engage students during the online lessons: PowerPoint presentations, short videos, quizzes, on-the-go recordings, referring to science labs, students may use scientific modelling and simulation applications to gain practical experience, keep the lessons simple, be kind grading assignments, find time to discuss students concerns about the current world situation during the lesson and ask each student how you can help. In addition, Ugonu (2019) states that reliable electricity must be available for e-learning.

Conclusion

Based on the findings of the study, it was concluded that there exists challenges of virtual teaching and learning in the post covid-19 era. This is evident as many institutions have not planned to join the virtual teaching and learning due to their inability to overcome the challenges. Some of the challenges like poor power supply and inadequate funding is very difficult to conquer because of the economic recession available in the nation which has affected the educational system. The study therefore, concluded that challenges of virtual teaching and learning in the post covid-19 era can be tackled by following the eight identified solutions to the challenges. The result of the hypotheses tested showed no significant differences in the mean ratings of lecturers of school business and management technology on 14 out of the 19 items, whereas, there are significant differences in the ratings of the lecturers on the remaining 5 items of the study.

Recommendations

Based on the findings and the conclusions of the study it was recommended that:

1. Institutions management should provide functional standby generating plant to enhance and ensure stable electric power supply to avoid interruption of lectures when using virtual teaching and learning method.
2. Institutions should organize computer literacy programme for both lecturers and students to train and retrain lecturers on the use of new technologies for virtual teaching and learning for effective instructional delivery.
3. One of the criteria for employment of lecturers in this global world should be based on the knowledge of new technologies and ICT competencies.
4. Education institutions should be adequately funded in order to acquire and maintain the new technologies for programme sustainability.



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