



Survey of the Level of Competence to Manage ICTS and Compliance to Virtual Learning/Teaching among Mathematic Lecturers in Tertiary Institutions in Niger State, Nigeria

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Abstract

This study was inspired by a concern over the Pandemic experience world over which as a result brought about virtual learning at all levels of Education. The study seeks in particular to find out the level of competence to manage ICTS and compliance to virtual learning among mathematics lecturers in Niger State, Nigeria. A cross-sectional survey research design was adopted for the study. A total of 52 lecturers were purposively selected from tertiary institutions offering mathematics as a course in Niger State to form the sample for the study. The instrument used for the study was researcher's designed questionnaire which was divided into three sections; competence of managing personal and shared ICT, competence of ICT skills for teaching and learning, and level of compliance in the use of virtual learning in teaching. The instrument (questionnaire) was validated by experts and Cronbach Alpha's value was computed to ascertain the internal consistency. The reliability coefficient of the questionnaire was obtained to be 0.82. The collected data were analyzed using Mean and Standard deviation with a criterion mean of 3.00 as the basis for judgment. Findings showed a low level of competence and skills in managing ICT among mathematics lecturers. The result also indicated a low level of compliance in the use of virtual learning in teaching by the lecturers. Hence, it was recommended among others that the management of various institutions should continue to enlighten lecturers on the need to comply with virtual learning so as to avoid the closure of institutions in case of unforeseen circumstances, such as insecurity, pandemic, and human and natural disasters in the future.

Keywords: ICT Skills, Competence, Compliance, Lecturers, Pandemic, Virtual Learning,

Introduction

The world has for quite some time now observed a significant improvement and advancement in Information and Communication Technology (ICT) in science education and indeed all sectors of the society (Al-Mamary, 2022; Ben Hassen, 2022; Githinji, 2022). The advancement has without a doubt revolutionized the information industry, making the management, access, and dissemination processes much easier, faster, and more efficient. Time and distances are no longer barriers to communication, interaction (teaching and learning), and economic transactions between people,



institutions, and nations across the world (Febrianto, Mas'udah, & Megasari 2020; Ibrahim, Titilayo, Suleiman & Ishola, 2020; Simamora 2020). Accordingly, government and other stakeholders in the education industry, particularly in Nigeria, were forced to see the value of integrating virtual learning at all levels of education in the nation's educational system (Eli-Chukwu, Igbokwe, et al. 2023; Olanrewaju & Afolabi, 2022).

In pursuit of the above, the Federal Ministry of Education in conjunction with the National Educational Resource Centre and Mathematic centre has consistently organized and sponsored training workshops meant to expose lecturers towards acquiring basic knowledge, skills and application of ICT in addition to computer appreciation and application. All these were tailored towards ensuring lecturers are virtual learning compliance.

Virtual learning, according to Nguyen and Nguyen (2023), is an online learning environment, initiated through the use of internet-based devices like computers, mobile phones, and sophisticated videoconferencing devices, in which both the lecturers and students are not physically present. This technology (Virtual learning) has succeeded in transforming the face of the educational system by bringing the learners from far and near together through the power of ICT (web conferencing, video conferencing, and telepresence technologies).

In a wider perspective, the Information and Communication Technology (ICT) which virtual learning is an aspect, to Van Mulders et al. (2023) refers to a wide range of digital electronic equipment use in storing, retrieving, manipulating, transmitting and receiving information electronically in a digital form. These technologies include computers, the internet; broadcasting technologies (radio and television) are virtually used among various institutions to supplement teaching methods already in existence. In fact, ICT when employed among mathematic lecturers has a set of advantages that help in instituting and creating strategies for more efficient delivery of the lessons, ensuring uninterrupted academic activities for the students. Following the advantages and the role played by virtual learning mode during the pandemic, the term new normal was ascribed to it. This term new normal in education triggered by COVID-19 is at present increased the usage of online in teaching and learning of not only the physical sciences but mathematics in particular. On this note, Educational institutions all over the world have been transformed, for many educational institutions, have entirely new method of teaching that they have had to adopt and comply with. undeniably virtual learning is now applicable not just to academics but also to extracurricular activities for students and that is more reason why in recent times, the demand for virtual learning has risen significantly, and it will continue to be so in the future.

Literature about level of competence to manage ICT and compliance to virtual learning/teaching among Mathematics lecturers exist with different views and finding. To reinforce the current study, other related works done were reviewed. Several studies such as Eli-Chukwu, Igbokwe, Ifebude, Nmadu, et al. (2023), Ezeugwu et al. (2016) Núñez-Canal, Obesso, and Pérez-Rivero (2022), Samoylenko, Zharko, and Glotova (2022) Yusuf et al. (2022) were carried out. In all of these studies, descriptive survey was employed. The findings however, revealed that Higher Educational Institutions are still in low level of adopting the e-learning mode of study. In addition, there was no existing e-learning curriculum before now particularly in Nigeria. Consequent upon the above, series of workshops were organized on ICT for lecturers, but a good number of them still lack the



proficiency and competence needed for ICT integration in education (Magawata, Muhammad & Ahmad, 2011; Mezieobi, 2008).

It is on this basis that this study aimed at assessing the level of competence to manage ICTS and compliance to virtual learning/teaching among mathematic lecturers in tertiary institutions in Niger State, Nigeria.

Aim and Objectives of the study: The aim of this study is to assess the level of competence to manage ICTS and compliance to virtual learning/teaching among mathematic lecturers in tertiary institutions in Niger State, Nigeria. Specifically, the research objectives are stated to assess:

1. Level of competence in managing personal and shared ICT by lecturers of tertiary institutions in Niger State
2. Level of competence of ICT skills for teaching and learning by lecturers in tertiary institutions in Niger State
3. Level of compliance in the using virtual learning environment by lecturers in tertiary institutions in Niger State

Research Questions: The study provided answers to the following research questions:

1. Are lecturers competent to manage personal and shared ICT in tertiary institutions in Niger State, Nigeria?
2. What is level of competence of ICT skills for teaching and learning by lecturers in tertiary institutions in Niger State
3. What is the level of compliance to virtual learning environment by lecturers in tertiary institutions in Niger State

Research Methodology

Descriptive cross-sectional survey research design was adopted for the study; the design is considered suitable when an identified finding of a studied population is to describe (Patten & Newhart, 2017). The population of the study comprised of the entire tertiary institution in Niger State, Nigeria. A total of 52 lecturers were purposively selected from tertiary institutions offering mathematics as a course in Niger state to form the sample for the study. The instrument used for the study was Researchers designed questionnaire that was divided into three sections; competence of managing personal and shared ICT, competence of ICT skills for teaching and learning and level of compliance. The instrument (questionnaire) was validated by experts and Cronbach Alpha's value was computed to ascertain the internal consistency. The reliability coefficient of the questionnaire was obtained to be 0.82. The collected data were analyzed using Mean and Standard deviation with a criterion mean of 3.00 as the basis for judgment. A calculated mean score of 3.0 and above was interpreted as a perceived high level of competence in managing personal and shared ICT, while mean score below 3.0 was regarded as low level of competence in managing personal and shared ICT.

Results

In this section, Table 1-3 are presented with their interpretations tailored towards providing answers to the research questions raised.



Table 1: Mean and standard deviation of lecturers' responses on level of competence in managing personal and shared ICT

		N	Mean	Std. Dev	Decision
1	If given the opportunity, I'm sure of managing personal and share ICT tools	52	3.17	.86	Agree
2	I have a computer phobia.	52	2.06	.89	Disagree
3	Fear of making mistakes makes me uncomfortable towards the use of ICT.	52	2.31	1.32	Disagree
4	Fear of making mistakes demoralises my interest towards the use of ICT	52	2.33	1.18	Disagree
5	I always hesitate to use ICT in case I look stupid.	52	2.42	1.21	Disagree
6	I get confused while standing to teach before student using computer	52	3.62	.66	Agree
Grand mean			2.65	1.02	

Decision Mean= 3.00

Table 1 shows the mean and standard deviations of respondents on the extent of lecturers' level of competence in managing personal and shared ICT in tertiary institutions in Niger State. The result obtained show that items 1 - 6 had mean ratings of 3.17, 2.06, 2.31, 2.33, 2.42, and 3.62 with standard deviations of 0.86, 0.89, 1.32, 1.18, 1.21 and 0.66 respectively. The table reveals further that, the grand mean score of responses to the 6 items is 2.65 which was less than the decision mean score of 3.00. This implies that lecturers' has low level of competence in managing personal and shared ICT.



Table 2: Mean and standard deviation of students' response on Level of competence of ICT skills for teaching and learning by lecturers in tertiary institutions in Niger State

		N	Mean	Std. Deviation	
1	I can login in social network (eg facebook/twitter)	52	3.44	.73	Agree
2	I can search for information using search engine e-mails	52	3.37	.77	Agree
3	I can download/upload using the internet as well as surfing educational websites	52	2.85	.75	Disagree
4	I have knowledge of using Microsoft word, excel, etc	52	3.48	.94	Agree
5	I can create new folder	52	2.04	.93	Disagree
6	I can change the format of file type (eg jpeg, bmp)	52	2.31	1.09	Disagree
7	Saving information in CD/flash drive is not a problem to me	52	3.37	.69	Agree
8	I can set wifi to retrieve information from internet	52	1.92	.74	Disagree
Grand mean			2.84	.83	Disagree

Decision Mean= 3.00

Table 2 shows the Mean and Standard Deviation response of level of competence of ICT skills for teaching and learning by lecturers in tertiary institutions in Niger State. The result obtained show that items 1 - 8 had mean ratings of 3.44, 3.32, 2.85, 3.48, 2.04, 2.31, 3.37 and 1.92 with standard deviations of 0.73, 0.77, 0.75, 0.94, .93, 1.09, 0.69 and 0.74 respectively. The table reveals further that, the grand mean score of responses to the 8 items is 2.84 which was less than the decision mean score of 3.00. This implies low Level of competence of ICT skills for teaching and learning among lecturers in Niger State.



Table 3: Mean and standard deviation on the level of lecturers' compliance in the use of virtual learning environment

Sno	Items	N	Mean	S.D	Decision
1	I use ICT to obtain information instantly	52	2.56	1.19	Disagree
2	I use ICT to engage students in class work	52	2.09	.95	Disagree
3	I use ICT to elicit the interest of students in the classroom	52	1.90	.91	Disagree
4	I use ICT to present my lessons in class	52	1.88	1.79	Disagree
5	I use ICT to develop teamwork among students	52	2.06	.85	Disagree
6	I use ICT to develop collaborative skills	52	2.30	1.55	Disagree
7	I think, I lack ICT skills in a wide range of areas	52	2.40	1.32	Disagree
8	ICT is effectively integrated in my teaching activities	52	1.65	.88	Disagree
9	I have a computer	52	2.75	1.17	Disagree
10	I have a laptop	52	2.65	.84	Disagree
11	My school have projectors	52	2.31	1.82	Disagree
Grand mean			2.23	1.21	Disagree

Decision Mean= 3.00

Table 3 shows the Mean and Standard Deviation response of level of lecturers' compliance in the use of virtual learning environment in tertiary institutions in Niger State. The result obtained show that items 1 - 11 had mean ratings of 2.56, 2.09, 1.90, 1.88, 2.06, 2.30, 2.40, 1.65, 2.75, 2.65 and 2.31 with standard deviations of 1.19, 0.95, 0.91, 1.79, 0.85, 1.55, 1.32, 0.88, 1.17, 0.84 and 1.82 respectively. The table reveals further that, the grand mean score of responses to the 11 items is 2.23 which was less than the decision mean score of 3.00. This implies low level compliance in the use of virtual learning environment among lectures in Niger State.

Discussion

Research question one sought to find out the extent of mathematics lecturers level of competence in managing personal and shared ICT in tertiary institutions in Niger state, Nigeria. The findings indicated that the mathematics lecturers in tertiary institutions in Niger State have low level of



competence in managing personal and shared ICT. Quite a number of the lecturers have a computer phobia and Fear of making mistakes which makes them uncomfortable towards the use of ICT. In addition, majority of them get confused while standing to teach before students using computer. This implies that mathematics lecturers have a low level of personal ICT competency. This is in agreement with the findings of Eli-Chukwu, Igbokwe, Ifebude, Nmadu, et al. (2023), Ezeugwu et al. (2016) who reported that mathematics teachers lacked the necessary personal ICT competency needed for classroom usage. The result is however in disagreement with the finding of Yusuf et al. (2022) who reported that lecturers have adequate personal ICT competency needed for classroom teaching and learning.

Research question two sought to find out the level of competence of ICT skills for teaching and learning by lecturers in tertiary institutions in Niger State. The finding revealed that the mathematics lecturers in tertiary institutions in Niger State have low Level of competence of ICT skills for teaching and learning. This is in agreement with the findings of Eli-Chukwu, Igbokwe, Ifebude, Nmadu, et al. (2023) on challenges confronting e-learning in higher education institutions in Nigeria amid covid-19, the study reported that Nigeria Higher Education Institutions are still in the early stage of adopting the e-learning mode mode of study.

Research question three sought to find out the level of compliance in the use of virtual learning environment among lectures in Niger State. The finding revealed that the mathematics lecturers in tertiary institutions in Niger State have low of compliance in the use of virtual learning environment among lectures in Niger State. This is in agreement with the findings of Ibrahim, Titilayo, Suleiman & Ishola, (2020) on study titled information and communication technology (ICT) utilization: a veritable tool for academic staff effectiveness in Nigerian polytechnics. In his study he asserted that the contribution of ICT utilization to the development of entire level of education today make it necessary for the compliance of ICT utilization by the school authorities, administrators as well as the lecturers in such a way that it easier for the utilization of application packages (like power point presentation, Microsoft word process, spreadsheet and so on)

Conclusion

This research work provides a complete assessment of the lecturer level of competence to manage ICTS and compliance to virtual learning/teaching among mathematic lecturers in tertiary institutions in Niger State. The findings suggest that lecturers who participated in this research have a significant low level of competence to manage ICTS and compliance to virtual learning/teaching

Recommendation

Based on the foregoing discussions, the following suggestions were made:

1. The management of various institutions should continue to enlighten lecturers on the need to comply with virtual learning so as to avoid closure of institutions in case of unforeseen circumstances, such as insecurity, pandemic and human and natural disasters in future.
2. The government should ensure adequate provision of funding for the provision of ICT facilities and equipment for lecturers in the institutions which is usually capital intensive and requires adequate budgetary allocation.
3. Efforts should be made by the government to ensure that every lecturer has access to ICT facilities for classroom teaching and learning.



4. Pre-service lecturers should be trained in the art of management to equip them with the prerequisite knowledge of ICT utilisation strategies that would be useful when appointed as rectors or similar positions.
5. School management should organise seminars and workshops on ICT utilisation strategies so that school managers could gain in-depth knowledge and understanding in this important area of ICT utilisation.
6. Philanthropist, alumni association and well-meaning individuals in the different communities in South-West Nigerian polytechnics should assist in the provision and management of essential ICT facilities.
7. The government should ensure that contractors handling the provision of school ICT facilities that are of good and top quality. This is the first step towards any maintenance effort that will promote academic staff effectiveness in the institution.

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