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# A study of virtual learning environment competencies among University lecturers in Ondo State, Nigeria

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## Abstract

This research examined the competence of university lecturers in Ondo State in utilizing virtual learning environments (VLEs). A descriptive survey design was employed, targeting all academic staff across the six universities in the state. A sample of 326 lecturers was selected from the population. Two state universities and one private university were selected via a simple random sampling while the only federal university was purposively selected. Participants were randomly selected across the various faculties in the selected universities. A researcher constructed questionnaire was used. The instrument was pilot tested on 15 lecturers of a non-participating university in the state and yielded a Cronbach alpha of .87, which indicated that it was reliable. Data were analysed with the use of percentages, standard deviation, and mean. The results indicated that most lecturers have laptops (85.28%) and Android phones (75.77%). One-fifth of the lecturers own tablets, with just a few (14.42%) having desktop computers. Lecturers are competent in the performance of some tasks while their level of competence in performing many critical tasks on the VLE is not encouraging. It was revealed that most lecturers can send and receive emails ($\bar{x}$ 4.68), set up email and other online accounts ($\bar{x}$ 4.38),  use of social media ($\bar{x}$ 4.37),  search for information using a web search engine ($\bar{x}$ 4.35), make calls and video communications via Whatsapp, Telegram, Skype, etc ($\bar{x}$ 4.26), create and make power point presentation ($\bar{x}$ 4.0), etc.  However, lecturers' competence level in some critical VLE tasks such as creating online assignments for students (($\bar{x}$ 2.99), record and edit sound ($\bar{x}$ 2.92), create interactive videos for learning ($\bar{x}$ 2.69), use google form for survey ($\bar{x}$ 2.63), enroll students in virtual class ($\bar{x}$ 2.61), create quiz for students on Virtual Learning Environment ($\bar{x}$ 2.49), create discussion forum on Virtual Learning Environment ($\bar{x}$ 2.48), harvest, grades and send discussion scores to students ($\bar{x}$ 2.46), etc was very low. Challenges such as unstable electricity supply and limited internet connectivity, work overload, inadequate training in virtual learning environment, lack of fund to purchase digital devices, lack of institutional support for digital literacy, low pace of ICT development in institution, inadequate computer skills, and lack of training on ICT for lecturer affect lecturers' VLE competency immensely. It was recommended that lecturers should acquire requisite skills in the use of Virtual Learning Environment while school managements should organise training, provide the infrastructure and ICT/VLE needs of their faculties, with maintenance allowance to cater for their off-campus internet and electricity needs.

**Keywords:** Virtual Learning Environment, VLE Competencies, University lecturers

## Introduction

The 21st Century teacher have been challenged by the COVID-19 pandemic. The pandemic has left an indelible mark in the global educational system particularly the pedagogy. It has ushered in a new dawn in the educational process and teachers need to adapt quickly in order not to be left behind and be irrelevant or old schooled/obsolete. The educational system is very dynamic and players or faculties need to be very dynamic with the innovations and changes in the system for optimal performance and efficient and effective discharge of their assignments. The new dawn presupposes that teachers at all levels need to adapt quickly in order not to be left behind, become irrelevant or old schooled. A major innovation in education is the use of virtual learning environment. However, it is not entirely new to many ODL institutions. The Corona virus pandemic has made it imperative and a must-adopt-innovation for all institutions regardless of modes.   It has revolutionalised the teaching pedagogy and all faculties must key into it. The new dawn require the faculties to be well equipped with the requisite ICT skills, including the virtual learning environment skills. Having such skills is in tandem with the new paradigm shift in the teaching learning delivery system.

Learners in the developing countries will embrace Virtual learning if properly implemented and harnessed with appropriate system to help learners. The situation today in Nigeria is the dearth of knowledge and practical skills on the part of lecturers who are expected to implement the VLE to the satisfaction of the learners. The acceptance of e-learning by learners depends more on the readiness, ability and technical know-how of the lecturers; after all, no one can give what he does not possess. This does not however rule out the fact that lecturers must start somewhere and grow gradually. In recent years, as the COVID-19 pandemic impacted countries worldwide, its detrimental effects on the educational systems of developing nations were particularly pronounced. Schools were abruptly shut down, and minimal progress was made in

sustaining the teaching and learning process, a gap that virtual learning could have bridged, were it not for the lack of competence among many teachers.

The pandemic has taught the education sector a bitter lesson and no one should be caught unaware again. The school system suffered greatly during the pandemic as a result of the inability of many lecturers to teach appropriately online (Oyadeyi & Ettu, 2023). The pandemic has created a major challenge for the globalhigher education system (Joseph et al., 2020), and exposed the digital literacy deficit in many lecturers (Oyadeyi & Ettu, 2023).

In fact, some institutions that were able to facilitate learning could not achieve much because of the poor digital literacy among their lecturers (Oyadeyi & Ettu, 2023). It is regrettable that many government-owned institutions had not embraced e-learningplatforms as a substitute face-to-face class.

The Virtual Learning Environment (VLE) is a veritable innovation that has taken teaching learning process beyond the classroom setting. It has made it possible to reach learners via digital tools without the need of physical contacts. Virtual learning environment is an e-learning system in which teachers teach their student online with the use of internet without face-to-face interaction. It is a non-traditional method of teaching delivery without the physical classroom environment.

Virtual Learning Environment is a boundless school or training environment between learners and teacher. The VLE is a non-physical classroom that engenders teaching-learning process through the application of digital technologies. Here both the teacher and the students participate via online interaction. The VLE offers opportunity for several tasks and activities just as in a physical classroom. Such tasks include online facilitation, discussion forum, assignment, quiz, test, examination, advice and guidance, etc. VLE offers unique opportunity to both the lecturers and the students to engage themselves at any place and time. In many conventional institutions, academic activities usually takes place in the day time, whereas it could take place at any time in the VLE situation so far the parties involved are in agreement. The VLEs are veritable tools for content management, curriculum planning and assessment, communication, administration of learner information, collaboration, real time teaching/facilitation, learner engagement, lecturers/facilitators' announcement, report generation, etc.

Nicholas-Omoregbe et al, (2017) described virtual learning environment (VLEs) "as tools used in the delivery of instructor-led synchronous and asynchronous online training/courses". Bernasconi (2023) defined VLE "as a virtual space where teachers and students transmit and assimilate knowledge at a distance". It is a web-based platform where a set of digital tools supplement traditional training or to assist students to enhance their learning.

A Virtual Learning Environment (VLE) is a web-based system that utilizes a range of digital tools to complement traditional instruction or support students in enhancing their learning experience. It enables remote interaction, access to learning materials, course information, and administrative functions.

Users can share resources, track their academic progress, and participate in various online activities.

Typically, a VLE includes features such as course syllabi, enrollment and payment details, comprehensive learning content (or even full online courses), self-assessment tools, discussion forums or chat functions, links to external resources, and interactive lessons. According to Olibie et al. (2014), popular VLE platforms include Moodle, Blackboard, WebCT, Canvas, and Sakai.

The following are the key characteristics of an e-LMS or VLE, according to Nicholas-Omoregbe et al. (2017): Managing instructional materials, developing curricula, collaborating and communicating, making announcements via tutors or courses, testing and assessment, and producing reports. Further more,an e-LMS for an educational system should be able to do some or all of the following: i. centralize and automate administration; (ii) integrate training initiatives on a web platform; (iii) support portability and standards; (iv) offer self-service and guided services; (v) be efficient in assembling and delivering learning content; (vi) personalize content and reuse knowledge (Nicholas-Omoregbe et al, 2017).

The potential benefits of virtual learning for ODL students, according to Ajadi et al. (2008) include:

1) Pupils advance at their own speed and acquire the knowledge they require.
2) The internet empowers students to take control of their learning choices and direction, while also enabling them to receive feedback quickly and effectively.
3) It is anticipated that e-learning and virtual learning will offer courses to students around the clock, every day of the week. This acts as a motivator to draw in members of the working class, students, and other people, like housewives.
4) Computer systems with a large capacity and internet connectivity help institutions' management cut expenses.
5) Additionally, virtual learning allows students an anonymous platform for discussion across gender, race, and culture, which boosts their confidence in their academic performance.

According to Ahmad (2012), virtual learning also has the following additional benefits: it facilitates the management of instruction and progress through the learning portal; it supports the integration of multimedia in both instructional activities and assessments tailored to learners' capabilities; allows for automated tracking of users' progress; enhances interactivity by encouraging learners to stay engaged and advance; accommodates individual learning differences—an essential principle in educational philosophy; among other benefits.

Technology Acceptance Model (TAM) (Davis, 1989) provided the theoretical framework for the study.: This model explains how users form attitudes and intentions to use a technology. In this study, TAM can help understand lecturers' acceptance and usage of VLE. The Technology Acceptance Model (TAM) explains how users develop attitudes and intentions toward

adopting a technology. It proposes that two key factors influence an individual's decision to use a particular technology:

- Perceived Usefulness (PU): This refers to the degree to which an individual believes that using a technology will improve their performance.
- Perceived Ease of Use (PEU): This refers to the degree to which an individual believes that using a technology will be free of effort. Others are:

1) External Variables: These are factors outside the individual that influence their perception of the technology, such as training, documentation, and support.
2) Attitude Towards Using: This is the individual's overall feeling towards using the technology.
3) Behavioural Intention to Use: This is the individual's intention to use the technology.
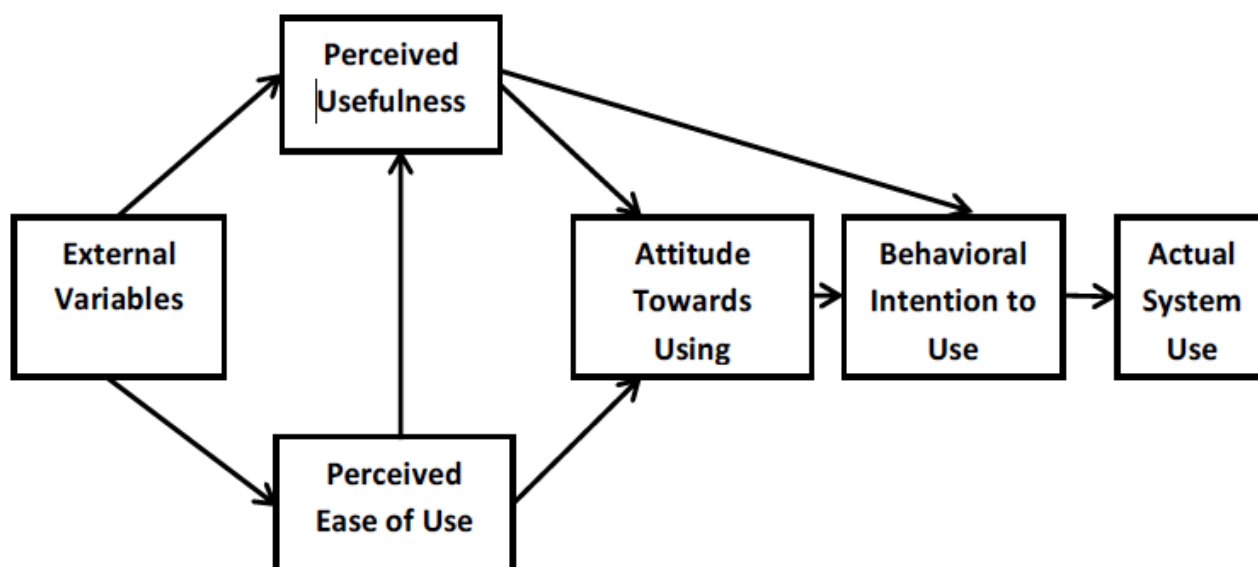4) Actual System Use: This is the actual usage of the technology.



**Figure 1. Technology Acceptance Model (TAM)**

It is assumed that lecturers' perceived usefulness of the VLE, and its perceived ease of use would influence their attitude and the actual adoption and usage of VLE.

**Lecturers' Ownership of Digital Devices**
One of the crucial factors to be considered in discussing the virtual learning environment competencies of lecturers is the ownership and accessibility to resources for the deployment of VLE.

The preparedness of teachers for virtual instruction in univer sities in the southwest region of Nigeria
was investigated by Ajadi and Adebakin (2022).     Academic employees of the six federally owned universities in the area made up the population of this study, which used a quantitative survey approach. There were 300 respondents for this survey, with 100 respondents from each of the three chosen universities making up the sample.
To provide an equal probability of selection, the random sam pling technique was used to choose both the institutions and the responders.
Data for the study was gathered using the Virtual Teaching in Nigerian Universities Questionnaire (VTNUQ). It was discove red that teachers had more access to computers (92.9%) and had personal computers at home, whereas just a small perce ntage (7.1%) had access it in the office.
Ajadi and Adebakin (2022) investigated the readiness of lecturers for virtual teaching in universities located in the South-western region of Nigeria. Using a quantitative survey

method, the study targeted academic staff from six federal universities in the area. A sample of 300 respondents was drawn, with 100 lecturers selected from each of three randomly chosen universities to ensure equal selection opportunity. Data were collected through the Virtual Teaching in Nigerian Universities Questionnaire (VTNUQ). The findings showed that a majority of lecturers (92.9%) owned personal computers at home, whereas only a small portion (7.1%) had access to computers at their workplace. Additionally, the study revealed that a minority of respondents (17.85%) had significant exposure to virtual teaching, while most had low exposure (42.86%) or none at all (39.29%). Regarding internet access, most lecturers accessed it on campus (92.8%), with very few having access at home (3.6%) or in the school library (3.6%).
At Obafemi Awolowo University in Ile-Ife, Omotayo and Fadehan (2007) looked into academics' access to computers and the Internet, their use of them, and the issues they encounter. The study revealed that 181 (77%) of all the respondents own a computer while 221 (94%) indicated that they have access to the computer. Therefore, 34 respondents who have access do not own a personal computer.  The findings further indicated that 187 (84.6%) of the respondents, who have access to the computer, use the Internet. A high percentage of respondents own a Personal Computer probably because the university has a computer loan scheme for academic staff. This is just fair as the institution supposed to provide digital devices needed by the faculties.

Abdulmajeed et al (2020) reported the economic aspect of faculties inability to be grounded in VLE as many do not have personal computers nor being provided by their institutions. Other resources such as electricity, internet facility among other things are not adequately provided. While some lecturers could afford good computers, many could not as a result of lack of fund. While it is expedient for every lecturer to be VLE compliant, it is worrisome that lecturers in developing countries are at disadvantage as some of them lacked digital devices such as laptop.

## Virtual Learning Environment Competences of Lecturers

Anyanwu et al. (2023) investigated lecturers' knowledge, access, and use of virtual learning platforms designed to support learners with visual and hearing impairments in Nigerian tertiary institutions. The study found that lecturers were knowledgeable about multimedia virtual learning resources catering to these learners, with a moderate perception of accessibility. Although there was little variation in how these resources were utilized, the use of voice notes and WhatsApp was notably high. Challenges hindering lecturers' effective use of virtual learning platforms included inadequate resources, limited data availability, unreliable electricity, insufficient funding, and low student attendance in online classes.

Pem et al. (2021) explored the effectiveness of virtual learning environment (VLE) components for online teaching, learning, and assessment across all colleges of the Royal University of Bhutan (RUB). The study employed a parallel convergent mixed-methods design. Data were collected from 22 academics and 43 students through online semi-structured interviews, while surveys were completed by 155 academics and 650 students. Additionally, usage reports from 93 VLE modules across the colleges were analyzed to validate findings from both qualitative and quantitative data.

The results indicated that academics generally had a positive experience adopting VLE for online instruction, though their proficiency was mostly limited to basic VLE functions. Students' perceptions of their instructors' online teaching skills varied widely, ranging from highly skilled to inexperienced. Not all academics were actively using the VLE as a teaching platform, and there were noticeable differences in ICT knowledge and skills among faculty across RUB colleges.

The researchers suggested that the abrupt transition from face-to-face to fully online instruction likely caused anxiety, hesitation, and uncertainty among lecturers. While most RUB academics possessed fundamental ICT skills and used the VLE to upload reading materials and share semester plans, only a few demonstrated advanced knowledge of the platform's diverse features for teaching, learning, and assessment. Features such as interactive content, discussion boards, quizzes, workshops, blogs, and assignment feedback were underutilized.

The study further highlighted that many RUB lecturers' lack of preparedness and understanding of effective VLE use negatively affected the quality and engagement of their online teaching, impacting student learning outcomes.

Supporting these findings, Ajadi and Adebakin (2022) reported that only 17.85% of Nigerian university lecturers had substantial exposure to virtual teaching, while 42.86% had limited experience, and 39.29% had none. Meanwhile, Tolorunleke et al. (2023) investigated the ICT capabilities and readiness of lecturers in Kogi State's tertiary institutions. Sampling 480 respondents from a population of 4,717 lecturers across nine post-secondary institutions, they found that lecturers had access to ICT resources and were both willing and capable of using these technologies for teaching and research purposes.

## Challenges of Utilising Virtual Learning Environment by Lecturers

Despite the potential of online learning via the VLE to bridge the wide admission deficit/gap that exist, there are challenges on the part of both the lecturers and students on its implementation. The adoption of e-learning in poor nations is hindered by socioeconomic, sociocultural, and IT infrastructure issues, according to Abdulmajeed et al. (2020).

The accessibility, cost, quality, and nature of IT devices and services are among the problems associated with IT infrastructure, according to the studyNigeria, like the majority of underdeveloped nations, faces particular challenges regarding elearning and VLE use. These include inadequate management and financial input, a lack of highly qualified personnel to handle elearning aspects, a lack of technology integration into practice, and curriculum mapping, that is, dividing courses and the curriculum into manageable chunks to meet particular elearning requirements (Rhema & Miliszewska, 2010; Abubakar, 2014).

The situation was further exacerbated by inadequate organizational commitment and insufficient infrastructure, compounding the challenges posed by teachers' limited e-learning skills. Nigerians who utilize VLE in their coursework face significant difficulties. For instance, when there is a lack of cooperation between organizations, a shortage of digital gadgets, a computer-related network and internet (Nwabude, 2020), an epileptic supply of electricity, students' and lecturers' computer anxiety, etc. (Oluwole and Oyadeyi, 2016). Nnabuike et al. (2020) and Abubakar (2014) highlight that developing effective e-learning in developing countries faces significant challenges, including a shortage of trained ICT personnel to support integration into academic programs and insufficient management and financial backing from both government and institutions. Anyanwu et al. (2023) further identify key factors limiting instructors' use of virtual learning platforms, such as lack of funding, inadequate data and electricity supply, limited resources, and low student attendance in online classes. Similarly, Ajadi and Adebakin (2022) found that although instructors had high internet access on campus (92.8%), access at home and in school libraries was very low (3.6% each).

This study is particularly significant as it examines the competencies of university lecturers in using Virtual Learning Environments (VLE). Competencies refer to an individual's skills and abilities to effectively perform specific tasks.

Not many studies have been carried out in Nigeria on this topic of interest. Most of the available studies focused mainly on computer literacy, knowledge, skills and anxiety, often neglecting those skills that are necessary for online facilitation and knowledge of virtual environment such as setting up online lessons/classes, creating and uploading videos for learning, organising zoom class, splitting teleconferencing class into groups, creating online quiz, assignments and examinations and discussion fora, harvesting of quiz, examinations, discussion forum and examination and sending students' scores to them online. Others skills include sound editing, effective use of power point and access, use of social media for academic purposes, insertion of scrolling marquis, etc. Lecturers' competencies in VLE will avert a repeat of any exigencies as COVID-19 pandemic. VLE competent lecturer can interface with his/students remotely synchronously or asynchronously. This study is capable of encouraging faculties to embrace the adoption of and dedication to the use of VLE which has become a necessary too for teaching in this digital age.

## Objectives

The primary objective of the study was to assess the virtual learning competence of University lecturers in Ondo State. Specifically, it aims:

1) To determine the ICT device(s) possessed by university lecturers in Ondo state.
2) To assess the virtual learning environment (VLE) skills among the university lecturers in Ondo state.
3) To identify challenges or factors affecting ICT/VLE skills/literacy/competence of university lecturers in Ondo state.

## Research Questions

1) What types of digital devices do university lecturers in Ondo state possess?
2) What is the level of virtual learning environment's competence among university lecturers in Ondo state?
3) What are the constraints to the Ondo state university lecturers' Virtual Learning Environment (VLE) competence?

## Methodology

The study employed a survey research design. The population for this study were all university lecturers Ondo state State. A sample of 326 was selected from the population based on Taro Yamane formula. Two state universities and one private university were selected via a simple random sampling while the only federal university was purposively selected. The only federal university was selected because it is the oldest, largest with more lecturers and as well the only university at the state capital. Participants were randomly selected across the various faculties in the selected universities. A researcher constructed instrument Questionnaire was used to collect data from the participants. It consists of 45 items. The first aspect of the instrument covers the respondents' bio-data. The second section is a Likert-type scale questionnaire which sought to ascertain the computer ownership among the lecturers. It also sought to elicit responses of the lecturers on their VLE competence and the challenges of utilising the VLE. The instrument was pilot tested on 15 lecturers of a non-participating university in the state and yielded a Cronbach alpha coefficient of .87 which indicated that it was reliable. The instrument was administered to the participants through Google form which was posted to the various institutions' social media platforms through lecturers. Data collected were analysed using descriptive statistics - frequency count, percentages, mean and standard deviation.

## Results

**Research Question One: What types of digital devices do university lecturers in Ondo state possess?**

**TABLE 1:** DIGITAL DEVICE(S) OWNERSHIP AMONG UNIVERSITY LECTURERS IN ONDO STATE.

| SN | ITEM | F | % |
|---|---|---|---|
| 1 | Desktop computer | 47 | 14.42% |
| 2 | Laptop | 278 | 85.28% |
| 3 | Smart phone | 247 | 75.77% |
| 4 | Tablet | 67 | 20.55% |
| 5 | Electronic Dictionary | 32 | 10.28% |
| 6 | Notebook PC | 14 | 4.50% |
| 7 | Others | 2 | 0.64% |

From Table 1, it is obvious that overwhelming majority (85.28%) of the lecturers own laptops. Next to laptop ownership are 247 lecturers, representing 73.77% have smart phones. One fifth of the lecturers own tablets with just a few Research Question Two: What is the level of virtual learning environment's competence among university lecturers in Ondo state?

(14.42%) having desktop computers. Lecturers having electronic dictionaries were 32 (10.28%) while 14 (4.50%) of the lecturers owned Notebook PC.

**Table 2:** Mean and standard deviation of virtual learning environment's competence among university lecturers in ondo state.

| SN | ITEM | SD | M | DECISION |
|---|---|---|---|---|
| 1 | Use ICT to interact with students synchronously and asynchronously. | 1.19 | 3.51 | Accepted |
| 2 | Setting up e-mail and other online accounts | 0.82 | 4.38 | Accepted |
| 3 | Send and receive emails | 0.61 | 4.62 | Accepted |
| 4 | Teach on-line class | 1.39 | 3.15 | Accepted |
| 5 | Create interactive videos for learning | 1.34 | 2.69 | Not Accepted |
| 6 | Use video conferencing tools such as Zoom, google meet, etc for online lessons | 1.44 | 3.26 | Accepted |
| 7 | Split online class into group | 1.30 | 2.34 | Not Accepted |
| 8 | Set up video lesson | 1.25 | 2.35 | Not Accepted |
| 9 | Set up virtual Library on e-course platform | 1.17 | 2.29 | Not Accepted |
| 10 | Enrol students in virtual class | 1.31 | 2.61 | Not Accepted |
| 11 | Create quiz for students on Virtual Learning Environment (VLE). | 1.28 | 2.49 | Not Accepted |
| 12 | Harvest and send quiz scores to students online | 1.37 | 2.40 | Not Accepted |
| 13 | Create discussion forum on Virtual Learning Environment. | 1.31 | 2.48 | Not Accepted |
| 14 | Harvest, grade and send discussion scores to students | 1.37 | 2.46 | Not Accepted |
| 15 | Create online assignments for students. | 1.34 | 2.99 | Not Accepted |
| 16 | Using e-Readers and downloading e-Books | 1.23 | 3.83 | Accepted |
| 17 | Search for information using a web search engine. | 1.11 | 4.35 | Accepted |
| 18 | Use of social media (e.g., blogging, Twitter, Facebook, telegram, Whatsapp, etc | 0.97 | 4.37 | Accepted |
| 19 | Make calls and video communications via Whatsapp, Telegram, Skype, etc. | 1.00 | 4.26 | Accepted |
| 20 | Record and edit sound. | 1.29 | 2.92 | Not Accepted |
| 21 | Create database with Excel and Access. | 1.40 | 3.28 | Accepted |
| 22 | Develop a hypertext format material and hypermedia for students. | 1.21 | 3.26 | Accepted |
| 23 | Create material in hot-mail or portable document format. | 1.29 | 3.02 | Accepted |
| 24 | Create and make power point presentation. | 1.22 | 4.00 | Accepted |
| 25 | Upload video lessons to YouTube. | 1.44 | 2.34 | Not Accepted |
| 26 | Use google form for survey. | 1.49 | 2.63 | Not Accepted |
| 27 | Provide learner support for students on-line. | 1.22 | 2.48 | Not Accepted |
| 28 | Change the default theme to make VLE attractive. | 1.17 | 2.09 | Not Accepted |

From table 2, it was clear that lecturers are competent in performing some tasks on Virtual Learning Environments (VLEs), but their level of competence in performing many tasks is not encouraging.

Lecturers showed high competence in basic ICT tasks. For instance, they can send and receive emails (mean score: 4.68) and set up email and online accounts (mean score: 4.38). They are also proficient in using social media (mean score: 4.37) and searching for information using web search engines (mean score: 4.35).

Additionally, lecturers demonstrated reasonable competence in tasks such as creating PowerPoint presentations (mean score: 4.0) and using e-Readers (mean score: 3.83). They can also use ICT to interact with students synchronously and asynchronously (mean score: 3.51).

However, the study revealed that lecturers' competence level is low in many critical VLE tasks. For example, they showed : 2.34).

Research Question Three: What are the constraints to the Ondo state varsity lecturers' Virtual Learning Environment (VLE) competence?

low proficiency in creating online assignments for students (mean score: 2.99) and recording and editing sound (mean score: 2.92).

Lecturers also struggle with creating interactive videos for learning (mean score: 2.69) and using Google Forms for surveys (mean score: 2.63). Their competence level is also low in tasks such as enrolling students in virtual classes (mean score: 2.61) and creating quizzes for students on VLEs (mean score: 2.49).

Furthermore, lecturers showed limited competence in providing learner support for students online (mean score: 2.48) and harvesting and grading discussion scores (mean score: 2.46). They also struggle with setting up video lessons (mean score: 2.35) and uploading video lessons to YouTube (mean score

**TABLE 3.** CONSTRAINTS TO LECTURERS' VLE COMPETENCE

| SN | ITEM | SD | M | Decision |
|---|---|---|---|---|
| 1 | Inadequate computer skills. | 1.45 | 3.15 | Accepted |
| 2 | Negative computer attitude. | 1.39 | 2.54 | Not Accepted |
| 3 | Lack of training on ICT for lecturers | 1.25 | 3.14 | Accepted |
| 4 | Low pace of ICT development in my institution | 1.36 | 3.24 | Accepted |
| 5 | Lack of institutional support for digital literacy among staff | 1.38 | 3.25 | Accepted |
| 6 | Epileptic power supply. | 1.16 | 4.05 | Accepted |
| 7 | Work overload. | 1.14 | 3.75 | Accepted |
| 8 | Lack of Internet connectivity in my office | 1.26 | 3.92 | Accepted |
| 9 | Lack of fund to purchase digital devices. | 1.23 | 3.64 | Accepted |
| 10 | Inadequate training in virtual learning environment. | 1.11 | 3.72 | Accepted |

From Table 2, the study identified several constraints that hinder lecturers' competence in Virtual Learning Environments (VLEs). These constraints were ranked based on their mean scores and standard deviations.

Epileptic power supply was identified as the leading constraint, with a standard deviation of 1.16 and a mean score of 4.05. This suggests that lecturers face significant challenges due to unreliable power supply, which affects their ability to effectively utilize VLEs.

Another major constraint is lack of internet connectivity, with a standard deviation of 1.26 and a mean score of 3.92. This indicates that lecturers struggle with accessing stable internet connections, which is essential for VLEs.

Work overload is also a significant constraint, with a standard deviation of 1.14 and a mean score of 3.75. This suggests that lecturers' heavy workload hinders their ability to develop and implement VLEs.

Inadequate training in VLEs is another constraint, with a standard deviation of 1.11 and a mean score of 3.72. This indicates that lecturers require more training and support to effectively utilize VLEs.

Other constraints that affect lecturers' competence in VLEs include lack of funds to purchase digital devices, lack of institutional support for digital literacy among staff, low pace of ICT development in institutions, inadequate computer skills, and lack of training on ICT for lecturers. These constraints have mean scores ranging from 3.14 to 3.64, indicating that they are significant impediments to lecturers' ability to effectively utilize VLEs.

Notably, the study found that negative computer attitude is not a significant constraint, indicating that lecturers have a positive attitude towards computers. This suggests that lecturers are willing to adopt and utilize VLEs, but face challenges due to other factors.

### Discussion of findings
**What types of digital devices do university lecturers in Ondo State possess?**
The findings of this study indicates that overwhelming majority of the lecturers own laptops and smart phones. Just a few of the lecturers own tablets, desktop computers, electronic dictionaries and Notebook. The results of this study are consistent with those of Ajadi and Adebakin (2022), who found that despite a small percentage of faculties(7.1%) have access to computers in the office, lecturers had greater access to computers (92.9%) as they owned a personal computer at home. Only a small percentage of respondents (17.85%) had substantial exposure to virtual teaching, while the majority (42.86%) reported limited experience, and 39.29% had no exposure whatsoever. The study also revealed that a minimal number of lecturers accessed internet facilities at home (3.6%), with most relying on campus access (92.8%), and an equally small proportion (3.6%) utilizing the school library(3.6%). This result is also in tandem with the report of Omotayo and Fadehan (2007) whose study discovered that 181 (77%) of all the respondents own a computer while 221 (94%) indicated that they have access to the computer. Therefore, 34 respondents who have access do not own a personal computer. The findings further indicated that 187 (84.6%) of the respondents, who have access to the computer, use the Internet.

What is the level of Virtual Learning Environment's competence among university lecturers in Ondo state?
The results of the investigation indicated that lecturers possess competence in carrying out certain tasks while their level of competence in performing many tasks on the VLE is not encouraging. It further indicates that the competence level of many lecturers in most critical VLE tasks is very low. This is consistent with Perm's (2021) findings, which indicated that academics had a generally positive experience utilizing VLE for online instruction. Furthermore, the study found that lecturers were generally proficient in using only the most basic features of the VLE for online instruction. However, students' evaluations of their instructors' online teaching skills varied significantly, with perceptions ranging from highly competent to inexperienced. Oyadeyi & Ettu, (2023) had also lamented that many institutions in Nigeria could not achieve anything during COVID-19 pandemic and that some institutions that were able to facilitate learning could not achieve much because of the poor digital literacy among their lecturers

## What are the constraints to the Ondo state varsity lecturers' Virtual Learning Environment (VLE) competence?

The outcome of the research showed that epileptic power supply lack of internet connectivity, work overload, inadequate training in virtual learning environment, paucity of fund to purchase digital devices, lack of institutional support for digital literacy among staff, low pace of ICT development in the institutions, inadequate computer skills, and lack of training on ICT are the factors affecting lecturer's virtual learning environment skills. The only factor that was not accepted as an inhibiting factor to lecturers' virtual learning environment is negative computer attitude. This demonstrated the lecturers' favorable attitudes about computers. This result supports the findings of Rhema & Miliszewsk (2010) and Abubakar (2014), who discovered, among other things, that there was insufficient management and budgetary support, a shortage of highly qualified staff to handle e-learning-related tasks, and a lack of technological integration into practice. The results of this study also concur with those of Nwabude (2020) and Oluwole & Oyadeyi (2016), whose research showed that there was a lack of cooperation among organizations, a lack of infrastructure, a lack of organizational involvement, a lack of a consistent supply of electricity, a lack of a computer-connected network and internet, a lack of digital devices because many academics could not afford high-quality ones, computer anxiety among students and lecturers, etc.

Still in consonance with the findings of this study, Oyadeyi & Ettu, (2023) identified poor digital literacy as a key factor affecting e-learning among Nigerian academics The results of Anyanwu et al. (2023) did not contradict the results of this study because they identified the primary obstacles that instructors face when utilizing virtual learning platforms and resources, such as inadequate resource availability, data scarcity, electricity shortages, and funding shortages.

## Conclusion and Recommendations

This study investigates the integration of virtual learning environments (VLEs) in Nigerian tertiary education, highlighting its potential to enhance learning outcomes, increase accessibility and promote flexibility in the educational process. However, challenges such as limited access to technology, inadequate digital literacy among lecturers, and the need for more inclusive virtual platforms hinder effective adoption. The findings suggest that VLEs can improve learning outcomes and increase accessibility, but their successful implementation requires addressing the existing challenges. The results of the study carry important implications for policymakers, educators, and researchers aiming to enhance the quality and accessibility of education in Nigeria. Effective implementation of VLEs requires investment in infrastructure development, digital literacy programmes, and inclusive design. Future research should focus on investigating the long-term impacts of VLEs on student outcomes, exploring the specific challenges faced by Nigerian students and lecturers, and examining the potential of emerging technologies to enhance online education.

The following recommendations are made.

1) Lecturers should acquire requisite skills in the use of Virtual Learning Environment. Lecturers need to develop the necessary skills for effectively using Virtual Learning Environments.
2) Lecturers need to develop the necessary skills for effectively using Virtual Learning Environments.
3) The various universities should provide the ICT needs of their faculties for improved service delivery. For instance, lecturers should be provided with personal computers, wifi, etc. Managements should provide technical support services to lecturers to address technical issues and ensure the smooth operation of VLEs.
4) Internet facilities should be provided for Lecturers in their offices.
5) The government should allocate sufficient funding and resources to support the development and implementation of VLEs in Nigerian tertiary education.
6) The government should ensure adequate provision of power supply in the country as epileptic power affects lecturers immensely.
7) Lecturers should be provided with a maintenance allowance to cater for their off-campus internet and electricity need. This could be factored into their monthly salaries.
8) There must be a deliberate effort to attend to the ICT needs of faculties through regular training with special attention to their VLE needs.

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