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LECTURERS' KNOWLEDGE, ACCESS AND UTILIZATION OF INCLUSIVE VIRTUAL LEARNING PLATFORMS IN NIGERIAN TERTIARY EDUCATION: IMPLICATIONS FOR LEARNERS WITH VISUAL AND HEARING IMPAIRMENTS

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ABSTRACT

INTRODUCTION: The ability of lecturers to choose and use appropriate virtual e-learning platforms for learners with visual and hearing impairments comes from the awareness of its existence, accessibility, and their perceived level of competence.

PURPOSE: The purpose of this study is to determine the knowledge, access and utilization of lecturers of virtual learning platforms that accommodate learners with visual and hearing impairments.

DESIGN: Descriptive survey method was used. Simple random sampling was used to select representative samples from the study. A structured questionnaire adapted from Okoro (2015) and titled "Lecturers e-learning knowledge, access and utilization questionnaire (LEKAUQ) was used for data collection. Collected data were analyzed using statistical mean. The results of the analysis were used to answer research questions. The study population is made up of all lecturers from the Alvan Ikoku Federal Colleges of Education Owerri in Nigeria as at the time of the study.

RESULTS: The result showed that the lecturers had knowledge of multimedia virtual learning resources that accommodate learners with visual and hearing impairments. Their perceived level of accessibility is moderate. The variation in ways of utilization is low; however their use of voice notes and WhatsApp is high. Challenges that affect lecturers' use of virtual learning platforms and resources include poor supply of resources, data, electricity, funding, and students' absence from online classes.

RECOMMENDATIONS: It is recommended that institutions of higher learning should take responsibility for making virtual learning resources available and accessible to lecturers and students. Equally lecturers should be formally sensitized on the need to use a variety of inclusive virtual learning resources. Institutions of higher learning should get lecturers involved in designing institution based resources.

Keywords: Virtual learning platforms, knowledge, access, utilization, hearing

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PUBLIC INTEREST STATEMENT

The study will be of importance to the institutions of high learning in designing institution based inclusive virtual learning platforms that will have features that allow presenting instruction through audio, video, pictorial and other formats. It will be of benefits to lecturers to be active participants in the development of institution-based platforms, in order to prepare and upload their instructional contents, such as course outline, course objectives, lectures, review questions, home-work, group and individual assignments, and so on.

INTRODUCTION

Virtual learning platforms and environments+ like Google classroom, Zoom meeting, Telegram, Whatsapp and others are important on-line internet gateways for online learning in the time of lockdown due to covid-19 pandemic. The National Council for Colleges of Education conveyed the Federal Ministry of Education Nigeria directive through a circular dated 23 March 2020 (NCC/PM/CFC/253/IV) encouraging all levels of education from basic to tertiary level to start online teaching of students through the use of various virtual learning platforms. There is need to use platforms that will help reduce deficits in learning which are imposed by visual and hearing impairments. Especially in this era of advocacy for inclusive societies and inclusive learning environment (UNESCO, 1994) and passage of anti-disability discriminate act by the Nigerian government in 2019.

These virtual learning platforms are accessed through the internet with the aid of some software and hardware of the Information and Communication Technology (ICT). Some hardware involved include smart phones, laptops, table top computers and related gadgets. The software apps include the play store, opera mini, chrome and Google drive. Adeloju (2018) observed that most of these computer and internet related facilities are used in academic engagements. She went on to point out that the effectiveness of the use is to a large extent dependent on the instructors' ability to understand and use such devices and software. Therefore, the instructor needs to be knowledgeable on how to use such resources before he/she can use it effectively. Adupoju (2018) conducted a study on utilization of ICT for e-learning

among some secondary schools in Port-Harcourt, using a descriptive survey design. She used questionnaire and interview as instruments for data collection. The study reported that the use of ICT for e-learning in Port-Harcourt was still in the infancy stage and the study sample was not sufficiently skilled in the use of ICT for e-learning. She recommended the enhanced use of ICT in teaching and learning engagement, believing that this will lead to better academic performance. However, there is a general assumption that the generation of students now are ICT compliant while most lecturers are just migrating to the ICT world (Bjekic, Obradovic, Vucetic & Bojovic 2014). In Nigeria, the entrance qualification examination for admission to tertiary institutions is computer-based and coordinated from the JAMB headquarters. This would lead to the belief that any student in Nigerian tertiary institution is computer literate and, as such, can cope with ICT driven teaching and learning experiences.

Similarly, Achugbue (2014) conducted a survey of librarian knowledge, anxiety, and attitude towards information and communication technology. He reported that the knowledge of the respondents about ICT was high and their attitude was positive; he pointed out that their anxiety about the use of information and communication technology was high. However, age, gender, and educational qualification were not significant predictors of the use of ICT devices. Researchers have examined the utilization of information and communication technology for e-learning within the regular school setting (Adeloju, 2018) and librarian knowledge, anxiety, and knowledge in university libraries towards ICT usage in university libraries

(Achugbue, 2014). These studies have shown that actual use of ICT hardware for educational purposes was low and marred by users' anxiety about their competence in using such gadgets. Most of the studies reported that respondents had knowledge about the ICT gadget but education, gender and age were not predictors of usage. However, ICT gadgets were available in the two areas of study.

The Federal Government of Nigeria has made efforts to ensure that Information and communication technologies are integrated into the educational system. This they have done through policy (FGN, 2015) and curriculum development and reforms. At all levels of education, introduction to use of computers is a compulsory course. The recent lockdown in effort to control the spread of Covid-19 came with the mandate to continue teaching and learning activities through virtual learning. Okoro (2015) reported that business education lecturers in Nigerian universities in the South-South and South-East regions were low in the usage of ICT in face-to-face teaching. One wonders what the rate of ICT application would be now that it is made mandatory due to national lockdown and closure of schools. The ability of the lecturers to choose and use appropriate virtual e-learning platforms will be based on their awareness of its existence, accessibility and their perceived level of competence. Okoro (2015) identified ICT resources and inadequate experiential knowledge about ICT as some of the predictions of low usage of power point in teaching and learning.

Efficiency and availability in the use of e-learning platform is one of the benchmarks cited by National universities commission (2015) that qualified few Nigerian universities they licensed for distance learning/education before the COVID-19 period. Due to the incidence of covid-19, tertiary institutions, whether licensed or not, for distance learning were directed to use e-learning to continue their teaching and learning engagements. Quite a number of researchers have investigated the relationship between application ICT to face to face teaching,

lecturers' knowledge and utilization of ICT in teaching, teachers perception of competencies and use of e-learning. Many of such researchers reported that teachers awareness of ICT did not match their usage of such facilities (Achugbue, 2014). For others, low usage was related to inadequate resources and sense of competence (Okoro, 2015).

There is need for the proper inclusion and involvement of these e-learning App usage to improve learning experiences. This may result in poor academic performance or what some writers called 'dumping' (Az) and lack of participation. This can lead to the feeling of being discriminated against or excluded. Inclusiveness also refers to accommodating the needs for individualized educational programmes. Experience has shown that Whatsapp and Google Classroom have provisions for giving private comments to individual students. They have facility for anonymity, whole group instructions, small group instructions, questions and assignment, video, slides, voice notes and graphics. These provisions help to make instructions accessible to all students, including those with hearing and visual impairments. The National Deaf Centre on Post-secondary Outcomes (2020) gave the following tips on how to accommodate learners with hearing impairment when teaching online. Some of such tips include:

1. Identifying students with hearing impairment in your class.
2. Use of flexible multimedia instructional presentation.
3. Use of captioned videos.
4. Trial of available Apps to see their suitability and probable modification needs.
5. Ensuring effectiveness of internet access, software and hardware for lecturer and students.
6. Collaboration with other support staff, such as sign language interpreters.
7. Openness and willingness to collaborate with major stakeholders.

Belay, Khatete and Mugo (2020) conducted a study on teachers integration

of e-learning for learners with specific learning disabilities. They reported that most of their respondents had inadequate ICT training and inadequate computer skills, some did not have formal training on ICT integration in teaching, and hence had low levels of ICT integration in teaching. They recommended that integration of ICT in teaching should be an integral part of the teacher training curriculum to increase the level of teacher competency. This the Nigerian Government has done through including use of information and communication technologies in all levels of education, including teacher education. Given this situation of things, the researchers sought to find out if teachers are knowledgeable about e learning resources. Researchers equally sought to determine accessibility, usage and challenges facing use of learning resources among lecturers in Alvan Ikoku Federal College of Education Owerri.

STATEMENT OF THE PROBLEM

There are some challenges students with hearing impairments face in learning, identified by Weber (2016), which can be tackled by proper application and flexible use of ICT. Some of such challenges include reading deficiencies (Martin, 1990; Debevc, Kosec & Holzinger, 2010), experimental shortages, inadequate knowledge and awareness. The loss of hearing predisposes one to such challenges. To compound this situation, Weber (2016), pointed out that ICT resources that could be used to improve their areas of deficiencies are not readily available.

Utilization of e-learning platforms refers to application of multimedia applications to teaching students online. One of the main accommodations for learners with hearing and visual impairments is the use of media of information that are accessible to them, but are not readily available. The use of multimedia applications is a continuum of accommodations for learners with sensory impairments. This involves the use of apps with video, voice, graphs, sign language interpretation, and tactile fonts. There is abundant research report that links multi-

sensory/multimedia modes of communication among undergraduates and improved communication engagement (Ali, 2020; Bjekic et al., 2014). With the presence of communication challenge (Zrigat & Al-smadi, 2012) posed by blindness, partial sightedness, being hard of hearing and being deaf, among students, there is need for e-learning Applications that will compensate for their losses. Restricted use of e-learning apps excludes them from learning experiences. This has resulted in poor academic performance or what some writers referred to as 'dumping' (Az) and the lack of participation, and has led to a feeling of being discriminated against or excluded.

PURPOSE OF THE STUDY

1. To find the level of lecturer's knowledge about inclusive e-learning platform
2. To find the level of accessibility of inclusive e-learning platforms to students and lecturers.
3. To find the level of utilization of virtual learning resources
4. To identify the challenges associated with the use of e-learning apps.

RESEARCH QUESTIONS

1. What is the level of knowledge of the lecturer about the inclusive e-learning platform?
2. What is the level of accessibility of inclusive e-learning platforms for students and lecturers?
3. What is the level of utilization of virtual learning resources?
4. What are the challenges associated with the use of e-learning apps?

METHODOLOGY

Research designs

The descriptive survey method was used for the study. The study adopted the survey research design. Survey was the preferred design because the researchers used questionnaire to gather information from the study sample on the variables under study in order to determine lecturers' knowledge, access and utilization of virtual learning platforms

that accommodate learners with visual and hearing impairments.

Population and Sample

The population for this study includes 200 lecturers in Alvan Ikoku Federal College of Education, Owerri from departments that enrolled students with visual and hearing impairments. The participants had between 4-30 years of teaching experience. Only 45 lecturers returned completed questionnaires and served as samples for the study.

Instrument for Data Collection

The instrument used for data collection was an adapted version of the Okoro (2015) instrument on the status, benefits, and challenges of power point usage. Part a of the instrument solicited information on demographic variables/characteristics of respondents like gender, area of specialization, job experience, category of students with disabilities taught. Section B had- items on lecturers' knowledge of available apps. Section c solicited information on accessibility of hardware and software and Section d is on utilization while Section e is on challenges encountered in the use of virtual learning technologies. Respondents were asked to tick statements as it relates to them concerning application of e-learning. The options were graded on a point scale. The options in sections A and B were Very high 5, High 4, Moderate-3, Low-2, Not at all-1. Options in section C were very often-4, often-3, sparingly-2, not at all-1. The options in section E were strongly agree (4), agree (3), strongly disagree (2), disagree (1). Instrument

was validated using Crombach Alpha and yield reliability coefficient of .82.

Procedure for Data Collection

The instrument was then manually administered by the researchers to make sure that the participants would take their involvement seriously and fill out the surveys in a respectable amount of independence. The questionnaires were immediately filled out and returned by the participants. Out of the 200 questionnaires retrieved, only 45 were used for data analysis since, despite the precautions taken, some of the surveys had to be rejected due to missing information. The software SPSS Version 26.00 was used to analyse the data that was gathered.

Method of Data Analysis

The analysis of mean and standard deviation data was used to analyze the data collected. The benchmark of 2.50 was used for acceptance and any mean below 2.50 was seen as low levels of knowledge, access, utilization and challenges. While mean scores above the benchmark are seen as moderate to very high levels of knowledge, access, utilization and challenges. Relationship between knowledge, access, challenges and utilization of inclusive e-learning platforms were analyzed using Pearson product moment Correlation and Multiple Regression.

RESULTS

Research Question 1: What is the level of knowledge of the lecturer about inclusive e- learning resources?

Table 1: Mean rating of lecturers' knowledge of e-learning resources

SN	Knowledge of E-Learning Resources	Mean	Remark
1	Computer	3.61	High
2	Laptop	3.53	High
3	Android Phone	3.92	High
4	Zoom Meeting	3.69	High
5	Google Classroom	3.30	Moderate
6	WhatsApp	3.84	High
7	Skpe	2.69	Moderate
8	Slides	3.38	Moderate
9	Voice Notes	4.00	High
10	Video Conferencing	3.15	Moderate
11	Giving Online Assignments	2.84	Moderate
12	Lecture Stream	2.92	Moderate
13	Grading Online	2.76	High
14	Attaching Files	2.84	Moderate
15	Online Interactive Classes	2.61	High
16	Individualized Instruction	3.69	High
17	Monitoring students' progress	3.37	Moderate
Total	Grand Mean	3.37	Moderate

The level of lecturer's knowledge about inclusive e- learning resources is moderate ($\bar{x} = \sum 3.37$). This is arrived at by summation of mean divided by number of items. The mean scores of all the items in Section A were above the benchmark of 2.5. This means that the lecturers in the

study had a high knowledge of virtual learning resources.

Research Question 2: What is the level of accessibility of inclusive e-learning resources to lecturers?

Table 2. Level of accessibility of e learning resources

SN	Access E-Learning	Mean	Remark
1	Computer	3.20	Moderate
2	Laptop	3.20	Moderate
3	Android Phone	4.20	High
4	Zoom Meeting	2.80	Moderate
5	Google Classroom	3.00	Moderate
6	WhatsApp	3.20	Moderate
7	Skype	1.80	Low
8	Slides	3.00	Moderate
9	Voice Notes	3.20	Moderate
10	Video Conferencing	2.80	Moderate
11	Giving Online Assignments	2.80	Low
12	Lecture Streams	2.80	Moderate
13	Grading Online	2.40	Moderate
14	Online Interactive Classes	2.80	Moderate
15	Attaching Files	2.40	Low
16	Sign Language Interpreter	2.60	Moderate
17	Power Supply	2.40	Low
18	Access to Data	3.06	Moderate

19	Access to Internet Connectivity	2.40	Low
Grand Mean		2.82	Moderate

Table 2 reveals that the level of accessibility of inclusive e-learning resources to lecturers is (2.82) moderately high. Access to items 7,11,13,15,17 and 19 are low. The mean values are below 2.50. while the mean scores for items 1,2,3,4,5,6,8,9,10,12,14,15,16,18 are above the mean criterion. This means that

majority of the lecturers have moderate access to inclusive virtual learning resources.

Research Question 3: What is the level of utilization of virtual learning resources?

Table 3. Mean rating of level of utilization of e learning resources

SN	Utilization of E-Learning Resources	Mean	Remark
1	Computer	2.25	High
2	Laptop	2.33	Low
3	Android Phone	3.33	High
4	Zoom Meeting	1.00	Low
5	Google Classroom	1.66	low
6	WhatsApp	2.66	High
7	Skpe	1.33	Low
8	Slides	2.00	Moderate
9	Voice Notes	2.66	High
10	Video Conferencing	1.00	Low
11	Giving Online Assignments	1.33	Low
12	Lecture Stream	1.33	Low
13	Grading Online	1.33	Low
14	Attaching Files	1.66	Low
15	Online Interactive Classes	1.33	Low
16	Individualized Instruction	1.66	Low
17	Monitoring students' progress	1.66	Low
18	Sign Language Interpreters	1.00	Low
Total	Grand Mean	3.37	Moderate

Table above shows that use of android phones, whatsapp, voice notes were high. The use of slides was moderate, while the use of other listed resources and their application to teaching was low. However, generally speaking, the use of variety of virtual learning application among lecturers is low hence the mean average is 1.75.

Research Question 4: What are the challenges associated with the use of e-learning applications and resources?

Table 4: Mean rating of challenges associated with use of e learning applications and resources

S/N	Challenges	Mean	Remarks
1	Poor students' students attendance to online classes	4.01	Challenge
2	Inadequate skills in use of e learning resources	2.05	Not a Challenge
3	Reluctance of lecturers to use virtual learning platforms	2.01	Not a Challenge
4	Inadequate supply of resources	3.87	Challenge
5	Scarcity of data	4.06	Challenge
6	Poor electricity supply	4.00	Challenge
7	Poor internet connectivity	3.69	Challenge
8	Insufficient funding	4.00	Challenge
	Mean Average	3.44	High

Table 4 shows that challenges lecturers face in the use of inclusive e-learning resources include; poor students attending online classes, inadequate supply of resources, poor electricity supply, poor internet connectivity, and insufficient funding. However, result shows that lecturers have sufficient skills and willingness to use virtual learning platforms. Although, there are many challenges (mean average 3.44) facing use of virtual learning platforms among lecturers.

DISCUSSIONS

The study sought to find out level of knowledge, access and, utilization of e learning resources among lecturers in a College of Education. Challenges facing the use of virtual learning resources during the COVID-19 lockdown was equally investigated. The findings of this study revealed that the lecturers had different levels of knowledge of e-learning resources. Similarly, Saidu and Kwadan (2020) reported that their respondents were familiar with ICT infrastructure but needed more training for effective use of such resources. This portrays the need to provide more training and exposure to relevant e-learning resources. The finding is in agreement with Adugbo and Mayowa-Adebara (2021), who pointed out that the knowledge level of librarians was not high. In essence, more training and exposure

will be needed. According to Onwuagboke, Nzeako and Eziaghighala (2018) and Onwuagboke, Singh and Onwuagboke (2014) electronic and other internet resources provide both students and staff with unrestricted access to information, packaged in different formats. This makes access to information universal and inclusive for lecturers and students. High knowledge of e-learning resources will provide lecturers a wide range of options to choose from, to make their instruction inclusive. This will reduce the level of exclusion of students with visual and hearing impairment from contents presented in virtual classrooms. It will reduce the level of frustration students with disabilities face in class. It will help teachers make learning content more accessible to learners with visual and hearing impairments.

The result also showed that the level of access of lecturers to e-learning resources was generally moderate. However, access to items like internet connectivity, power supply, use of platforms to attaching files and grade assignments were below the benchmark. This is in agreement with Onwuagboke et al. (2018) who stress the need for institutions to make these virtual learning platforms and resources more aessential for instructional use.

Utilization of varieties of virtual learning platforms and resources was generally low (mean \uparrow 1.75) However,

use of android phones, whatsapp, voice notes were high. The use of slides was moderate, while the use of other listed resources and their application to teaching was low. However, generally speaking, the use of variety of virtual learning application among lecturers is low hence the mean average is 1.75. In relation to low usage of e-learning facilities, Onwuagboke et al. (2014) recommended that lecturers should be trained on effective application of internet facilities for learning. The authors equally stressed the need for institutions to provide adequate resources. Use of e learning resources involves the knowledge of their existence, having access to them and ability to use them to provide multiple presentation format and multiple ways of engaging student and stimulating their responses. According to David and Meyer (2005), the Universal Design of Learning (UDL) involves presentation of instruction in varied formats. These formats engage the student and motivate them to respond in ways that accommodate their differences in terms of personality, culture, learning style, background and disability. Ability to use e learning resources is becoming an essential part of teaching and learning at all levels of education. E learning resources are use for instructional delivery ,individualized instruction, giving assignment/exercises to students, grading students work ,monitoring students progress, providing instruction in visual, auditory and tactile or kinesthetic designs (David & Meyer 2005). This is in agreement with Belay et al. (2020) reports. One can conclude that in the post covid 19 era, institutions of learning will require lecturers who are skilled in using e learning resources to provide distant learning experiences for more students. Aduba and Mayowa-Adebara (2021) revealed that schools will need to train their teachers on the use of ICT in class and outside the class instruction, especially in this era of isolation and social distancing, in an effort to curb the spread of the COVID-19 virus.

The result also showed that there are challenges that hinder lecturers' effective use of inclusive e-learning platform and resources. Such challenges

include; poor students attendance to online classes, inadequate supply of resources, poor electricity supply, poor internet connectivity, and insufficient funding. However, result showed that lecturers have sufficient skills and willingness to use virtual learning platforms. Although, there are many challenges (mean average 3.44) facing use of virtual learning platforms among lecturers.

CONCLUSION

Lecturers knowledge of inclusive virtual learning platforms and resources is high but the utilization is still low and faced with challenges that hinder their effective usage. Some of these challenges include: shortage of resources, poor power supply, poor internet connectivity, low student attendance in online classes, and insufficient funding. Virtual learning platforms by their nature provide an avenue for breaking distance based barriers to learning. It equally gives opportunity to package instruction in a variety of modes. This means that different types of learners from different geographical locations can learn through the same channel as far as their connectivity, basic application skills, appropriate soft and hardware and power supply. The ability of teachers/lecturers to use virtual learning platforms to accommodate visual auditory and kinesthetic learners is very important. This will provide opportunities for learners with visual and hearing impairments to benefit from virtual teaching and learning experiences.

RECOMMENDATIONS

Based on findings of this study, the following recommendations are made:

1. Institutions of high learning should design institution based inclusive virtual learning platforms that will have features that allow presenting instruction through audio, video, pictorial and other formats.
2. Lecturers should be active participants in the development of institution based platforms.
3. Lecturers should receive funds to finance the virtual learning venture.

4. Lecturers should be given timelines to develop, prepare and upload their instructional contents. Such contents may include: course outline, course objectives, lectures, review questions, home work, group and individual assignments, etc.
5. There should recognition and remuneration to motivate lecturers to embrace the virtual learning venture.
6. Lecturers must be trained on the proper use of virtual learning platforms.
7. Institutions should determine and use avenues that will make virtual learning accessible and affordable for students.

Conflicts of Interest: The authors declare no conflict of interest.

Disclaimer Statement

This research is an independent study carried out by the researchers to determine lecturers' knowledge, access and utilization of virtual learning platforms that accommodate learners with visual and hearing impairments. Therefore, this article is the result of the research.

Authors' Bionotes

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Authorship and Level of Contributions

Chikodi Joy Anyanwu conceived the topic of the study, she supported the development of the proposal and participated in the conduct of the field/data collection. Supported other researchers in coordinating the research team.

Catherine James Atteng was responsible for the collation of data for this research study. He was also actively involved in the compilation of the final results.

Ogechi Chioma Orji and Glory Ifeyinwa Ibeabuchi participated as a co-researcher and worked on the collection, analysis, and interpretation of data. He was also involved in other joint activities of the research work.

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