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Analysis of Teachers in the Use of Digital Resources in Online Teaching and Assessment in COVID Times

Análisis de los docentes en el uso de recursos digitales en la enseñanza y evaluación en línea en tiempos de COVID

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ABSTRACT

The study considered the use of online learning applications for instructional delivery and assessment purposes in higher institutions of learning that stimulates a new atmosphere where lecturers could utilize these facilities to promote learning. The study also determined the gender difference between lecturers use of online learning applications for instructional delivery and classroom assessment in a post-covid context. The digital applications analyzed in this study include Google classroom, Email, Moodle, Canvas, Google, Microsoft Team, Zoom, Google Meet, Cisco Webinar, Facebook groups, Open Educational Resources (OERs), Google docs, Google slide, WhatsApp and Telegram Channel. At present, however, opinions are divided over the extent to which lecturers utilize these online learning applications in instruction and assessment. A descriptive survey research design was adopted with 152 participants (n = 88 males and n = 64 females) for the study and the instrument used for data collection was Utilization of Online Leaning Applications in Classroom Instruction and Continuous Assessment Questionnaire (UOLACICAQ). On December 2021, the participants completed the Questionnaire. The internal consistency of the instrument was determined using Cronbach's Alpha and the reliability index of .93 was obtained. Results of the study show a low extent of utilization of online learning applications in classroom instruction and continuous assessment (Canvas, Microsoft Team, Google Meet, Cisco Webinar, OERs, Google slide, Telegram Channel, Facebook groups, Moodle, Google Classroom, learning management systems, Google forms and Google sheet). There was however, a significant difference between male and female lecturers' use of online learning applications for continuous assessment. Lecturers' utilization of online learning applications in instruction and assessment of learning will expose them to different online learning applications used in delivery instructions and assessing students' learning. The research supplies good idea of the instrument for

measuring those staked learning outcomes in higher institution. However, lecturers do not differ in terms of the extent to which they use online learning applications while delivering instructions in the classroom based on gender.

KEYWORDS Online education; teachers; technology; ICT; COVID.

RESUMEN

El estudio consideró el uso de aplicaciones de aprendizaje en línea con fines de enseñanza y evaluación en instituciones de aprendizaje superiores que estimulan una nueva atmósfera en la que los profesores pueden utilizar estas instalaciones para promover el aprendizaje. El estudio también determinó la diferencia de género entre los profesores que usan aplicaciones de aprendizaje en línea para la enseñanza y la evaluación en el aula en un contexto post-covid. Las aplicaciones digitales analizadas en este estudio incluyen el aula de Google, Correo electrónico, Moodle, Canvas, Google, Microsoft Team, Zoom, Google Meet, Seminario web de Cisco, grupos de Facebook, recursos educativos abiertos (REA), documentos de Google, diapositivas de Google, canal de WhatsApp y Telegram. En la actualidad, sin embargo, las opiniones están divididas sobre la medida en que los profesores utilizan estas aplicaciones de aprendizaje en línea en la instrucción y la evaluación. Se adoptó un diseño de investigación de encuesta descriptiva con 152 participantes (n = 88 hombres y n = 64 mujeres) para el estudio y el instrumento utilizado para la recolección de datos fue la Utilización de Aplicaciones de Aprendizaje en Línea en la Instrucción en el Aula y el Cuestionario de Evaluación Continua (UOLACICAQ). En diciembre de 2021, los participantes completaron el Cuestionario. La consistencia interna del instrumento se determinó mediante el Alfa de Cronbach y se obtuvo el índice de confiabilidad de .93.Los resultados del estudio muestran un bajo grado de utilización de las aplicaciones de aprendizaje en línea en la instrucción en el aula y la evaluación continua (Canvas, Microsoft Team, Google Meet, Cisco Webinar, OER, Google slide, Telegram Channel, grupos de Facebook, Moodle, Google Classroom, sistemas de gestión de aprendizaje, formularios de Google y hoja de Google). Sin embargo, hubo una diferencia significativa entre el uso de aplicaciones de aprendizaje en línea para la evaluación continua por parte de profesores masculinos y femeninos. La utilización de las aplicaciones de aprendizaje en línea por parte de los profesores en la instrucción y la evaluación del aprendizaje los expondrá a diferentes aplicaciones de aprendizaje en línea utilizadas para impartir docencia y evaluar el aprendizaje de los estudiantes. La investigación proporciona una buena idea del instrumento para medir los resultados de aprendizaje en juego en la institución superior. Sin embargo, los profesores no difieren en cuanto a la medida en que utilizan aplicaciones de aprendizaje en línea mientras imparten instrucciones en el aula según el género.

PALABRAS CLAVE Educación online; profesorado; tecnología; TIC; COVID.

1. INTRODUCTION

It is no longer news that the world has gone digital. The digital train moves so fast that its impact is felt in all spheres of human endeavours such as agriculture, financial services, transport and logistics, news media, health care and more importantly, education. A successful digital conversion for classrooms is not determined by the technology, but by how technology enables teaching and learning (McKnight, et al., 2016). The education sector as well is not left out of this advancement brought about by the digital technology also known as the Information and Communication Technology (ICT) in this study. ICT according to Liverpool as cited in Daramola and Omoyajowo (2016) is used to represent technologies requiring the collecting, storing, editing and transmitting of information using different forms. The term ICT has been considered an all-encompassing name for digital and electronic devices, applications, communication devices, hardware, software and related devices or application. The Organization of Economic Cooperation Development (OECD) as highlighted in Curtin (2002) viewed ICT as a series of activities such as storage, capturing, processing and

transmitting of information with the help of electronic devices. Thus, ICT could be said to mean information retrieval, processing, storing and transmitting using the computer and other technological-based devices. According to Liverpool as cited in Daramola and Omoyajowo (2016), the following are characteristics of ICT: it is a broad and fast-changing subject, communication of data by electronic means, storing, retrieving, manipulating, processing and distributing of information, involves digital sharing of information through internal or external networks, it is a technological tool for manipulating information or data. Information and Communication Technology has led to changes in the educational context; however, its incorporation in schools is not synonymous with nor a guarantee of its use as a didactic tool in the teaching and learning process (Orozco et al., 2022). Technological development in the past few decades has generated important changes in the educational field, which have resulted in new approaches that require the use of digital tools in arts education (Villares, & Sánchez, 2022).

Digital technology through facilitation of delayed-time discussion, directed instruction, and self-learning, among others, has been found to encourage learning (Yuen et al., 2003). The learning is facilitated by various digital learning platforms such as online and offline remote teaching technologies. Remote teaching occurs outside of the physical classroom. It is a situation where the teacher is separated from his/her learners by distance and sometimes by time. Learners are separated from their peers as well. Remote learning takes place online or offline (Federal Government of Nigeria [FGN], 2021). In online learning, learners can either learn at the same time (synchronously) or at a different time (asynchronously). It requires the use of internet connections. While offline digital learning is a system where information and knowledge are shared without the need to access the internet. The teachers and learners can share information and ask questions, but at different times, activities may not be simultaneous. Some major advantages of online digital learning over offline is that teaching and learning happen in real-time, it is more engaging and effective, and allows immediate feedback to learners.

Digital learning generally brings about improved learning outcomes, classroom instruction and assessment, administration as well as the development of essential skills among underprivileged groups (Palloff, & Pratt, 2013; Sharma, 2003). Yusuf (2005) also noted that digital learning impacts the process of research and educational instructions. Ali et al. (2013) noted that incorporating digital technology in the classroom offers the teacher and the students the opportunity to operate, control, store, and retrieve data as well as promoting self-regulated learning. This digital technology-facilitated learning according to Hussain et al. (2017) deals with an increased tendency and zeal toward learning that is collaborative among learners and instructors that is not dependent on specific classrooms. This learning pattern contrasts the traditional learning environment as it provides the opportunity for learning activities that are not dependent on face-to-face interaction, especially in the case of online digital learning technologies. In reference to students digital competence level, they have a high self-perception, especially in those skills related to communication and multimedia elements, which are the ones that they most commonly use in their everyday life (Sánchez-Caballé et al., 2019).

The rapid evolution in online digital technologies has also impacted positively the Post COVID-19 work environment, most especially in teaching and learning (Almazova et al., 2020; Charters, & Murphy, 2021; Crick et al., 2020; Mustapha et al., 2021). Now we have smart classrooms where smart/digital devices are applied to improve the learning outcome of traditional education. Smart education can be applied in a virtual or physical environment, or a blended scenario (Huang et al., 2013; Yang et al., 2022). A virtual environment

could include cloud servers, smartphones, emails, smart communication tools etc. Remote learning is another post-COVID-19 facilitated work environment. This is a situation where remote teaching takes place outside of a physical classroom (Dean, & Campbell, 2020; Rapanta et al., 2020). The teacher is separated from his/her learners by distance, time or both. The students are also separated from their peers. Online assessment, homeschooling and collaborations are other digital learning practices that became essential Post Covid-19 teaching and learning environment.

When digital technology is appropriately utilized in higher institutions of learning, students are usually equipped with the relevant knowledge and expertise to be efficient in the 21st century (Andoh, 2012). This can invariably boost access to educational resources, improve equality in the education system, promote quality teaching/learning and enhance the professional development of educators which will in the end improve the management of the educational system. Studies focusing on the utilization of online learning applications and tools in classroom instruction and continuous assessment have helped to determine which tools/applications are capable of accomplishing certain educational objectives (Mohmmed et al., 2020; Pererva et al., 2020; Saini, & Al-Mamri, 2019). The integration of online learning application and tools in the field of education provides lecturers with the opportunity to deliver their lectures anywhere and at any time, hence time and place is no longer barrier to education even amidst global disruptions such as the COVID-19 pandemic. It also enables lecturers to record and store information on students' intellectual development as well afford lecturers the time to focus on other activities since the process of assessment and feedback on students' progress will be monitored via the online learning platform anytime and anywhere. The use of online learning tools/platforms in education has made it easier for scholars to assemble information quickly, organize the information as well as use the information to pass across knowledge in different subjects or fields (Saini, & Al-Mamri, 2019).

The importance of adopting online digital learning in education cannot be overemphasized. Among the evolving trends in ICT, the online learning platforms such as Learning Management Systems (LMS) and electronic-based assessment and evaluation system has gained unprecedented attention in assessing complex competencies (Mohamed et al., 2019). The enormous contribution of digital learning tools to the field of education is evident all over the world (Cook, & Triola, 2014; Maity et al., 2021; Talebian et al., 2014). As pointed out by Pelgrum (2001), it is in line with the acknowledgement of the above that the education system witnessed the speedy integration of computers and networking. This according to Becker and Ravitz (2001) is perhaps just the beginning of what the future holds concerning online digital presence in the world of education.

The foregoing is an indication that the field of education has been empowered by the development of technology. However, it is important to note that integrating digital technology into the school curriculum has been a great challenge. This is because teachers and lecturers as well as educational stakeholders require some level of skills and competence for ease of integration (Mielikäinen, 2021). It is in the consideration of the points above that Cuban (2000) stressed the need to consider lecturers' knowledge and skills while adopting digital technologies within the classroom context. Thus, more efforts are expected from educational custodians such as teachers and lecturers in the field of education to be able to effectively integrate online digital technology in such aspects of education as assessment. Assessment deals with the process of gathering data to make informed educational decisions that have to do with the learners, curricula and educational policies (Nitko, & Brookhart, 2007; Suskie, 2018; Swaffield, 2011). Assessment could be seen to

be concerned with the process of gathering data from a variety of sources on the activities of teaching and learning for understanding, describing and improving learning. In essence, assessment targets pointing out students' strengths and areas requiring more attention. Assessment is viewed to be pivotal in the field of education (Ugodulunwa, 2008). Assessment helps to validate the effectiveness of the teaching and learning process. Through assessment, the instructor can determine students' areas of strength and weaknesses. Thus, through assessment, educational decisions or judgement can be made.

Through assessment, the level of teachers' instructional effectiveness can also be ascertained. The assessment provides feedback on the activities of teaching and learning. Through assessments, selections, instructional decisions, classification and certification, among others can be made regarding students. A common form of assessment employed by lecturers and instructors is continuous assessment. Continuous assessment as defined by Ugodulunwa (2008) deals with the systematic and periodic assessment that takes into account what an individual has been able to learn in terms of cognitive, affective and psychomotor domains at the end of a unit, a course or programme. This definition sees continuous assessment as a regular and systematic process that covers the three domains of learning. Thus, continuous assessment is cumulative, systematic, comprehensive and guidance oriented. The adoption of online digital technology is an essential tool and agent of change in continuous assessment in education as it enables delivery of continuous assessment to remote students and facilitates record-keeping and analysis of data relating to students learning process. Integration of online digital platforms can improve efficiency and support educational decision making through enabling lecturers to gather and analyse student responses and compare testing and non-testing techniques. Common online mechanisms for collecting data on assessment include the use of learning management systems such as Moodle, Canvas, Google classroom and Microsoft team, other includes google forms, google sheets, and Survey Monkey among others (Durak et al., 2022; Mpungose, 2020). To make data from such assessment mechanisms understandable, lecturers must be able to analyse and report results relating to the assessment. Hence, it is important to determine if lecturers are utilizing online learning applications in the process of assessment.

This study examined the use of online learning applications for instructional delivery and assessment purposes in higher institutions of learning in post Covid. The study highlighted the concept of digital technologies and their application in the education system in enhancing assessment and particularly continuous assessment. Pre-covid and mid-covid studies have shown the failure rate of integrating online learning platforms in the classroom (Al-Maroof, & Salloum, 2021; Mesfin et al., 2018). Studies have also indicated that the rate at which school teachers employ the use of online learning platforms is very low (Nawrot, & Doucet, 2014; Panigrahi, 2018; Wang et al., 2013). The study of Salman et al. (2013) showed that teachers and students are aware of the use of online learning in teaching some specific subjects. Equally, the study showed that private and public-school teachers are significantly different in terms of their level of awareness of digital technologies in teaching. The study of Yushau and Nannim (2020) showed that teachers possess a low level when it comes to utilizing ICT facilities. According to the authors, this is due to a lack of technical know-how by the teachers in instructional delivery with ICT facilities. Although Mesfin et al. (2018) show that teachers' and students' experience of using advanced digital technologies is fair, there is limited access to multimedia-rich e-learning resources and premature practice of adopting the technology into teaching and learning. Also, Oriji and Anikpo (2019) found that even though lecturers and students possess

internet-enabled mobile phones, they were not properly utilizing Whatsapp instant messaging for effective academic activities as only 15 (11.7 %) of lecturers and 243 (22.9 %) of the students were using it for academic purposes. The result further revealed that 100 % of both lecturers and students never received any form of training for the use of Whatsapp mobile technology. Bryan et al. (2018) found that students tends to engage more intensively in online classes when they frequently interact with peer students also using technology. Another study by Bawa et al. (2022) shows that undergraduate students had positive perceptions of the utilization of Moodle LMS. It was also found that some of the problems associated with the use of the platform for learning include inconsistency of power supply and technical and psychological issues. Octaberlina and Muslimin (2020) on their part carried out a study that investigates the online learning barriers to using Moodle and Google Classroom, results show that students experienced three barriers during online learning which include unfamiliarity with e-learning, slow internet connection, and physical condition e.g. eye strain.

Peytcheva-Forsyth and Aleksieva (2021) carried out a study on the forced introduction of e-assessment during the COVID-19 pandemic and the result shows that students were mostly summatively assessed through course works (artefacts) submissions and tests, and the use of different types of formative assessment was very limited. The technologies utilised for the assessments by academic staff were also very deficient. The results further show that most of the teachers transferred their experience and approaches to students' assessment from face-to-face to the online environment without adaptation and modification to details of the latter. This reduced to a certain extent the trust of students in e-assessment and reinforced their preference for a face-to-face assessment.

The above is an indication that lecturers in Nigerian tertiary institutions lack adequate access to digital learning such as online learning platforms. The lack of relevant digital learning resources and skills in some colleges of education affects the level at which lecturers use the digital platforms in the assessment of students. This situation is worrisome in our tertiary institutions that are in the South-South region of Nigeria. These worrisome situations made the researchers evaluate the extent lecturers use information technologies in classroom instruction and assessment. Therefore, the aim of this paper is to investigate the use of online applications for teaching and assessment in a post-covid context. The study also determined the mean difference between male and female lecturers on the use of online learning applications for instructional delivery and classroom assessment in a post-covid context. The following research questions were addressed in this current study:

1. To what extent do lecturers use online learning applications in classroom instruction in post-covid lockdown?
2. What is the extent to which lecturers utilize online learning applications in classroom assessment in post-covid lockdown?
3. What is the mean difference between lecturers on the use of online learning applications for instructional delivery in a post-covid context based on gender?
4. What is the mean difference between male and female lecturers on the use of online applications in classroom assessment in a post-covid context?

2. MATERIAL AND METHOD

2.1. Research Design

The researchers adopted a descriptive research design. This research design explains the characteristics, features or attributes of a given phenomenon, events, objects or groups of persons (Nworgu, 2015). This is because this study described the characteristics of lecturers in colleges of education on their level of utilization of online learning applications while assessing students. The study was conducted at Colleges of Education in Nigeria. The survey response data were retrieved in December 2021 and it lasted for one (1) week through questionnaire administered to each participants face-to-face.

2.2. Participants

The participants were Lecturers from two Colleges of Education in Nigeria. A total of 152 lecturers participated in the study which comprised 88 male lecturers and 64 female lecturers drawn from the Colleges. All the 152 participants invited for the study voluntarily agreed to participate in the study. The participants' biodata is presented in Table 1.

TABLE 1. Bio-data of the Participants

Demographic Information		N	Qualification			
			B.Sc.	Masters	Ph.D	
Gender	Male	88	19	40	29	176
	Female	64	21	16	27	128
Total		152				
Age	35-45	38	18	16	4	76
	46-55	53	15	27	11	106
	45-63	43		34	9	86
	≥64	18		13	5	36
TOTAL		**152**				

2.3. Research Instrument

The study made use of the "Utilization of Online Leaning Applications in Classroom Instruction and Continuous Assessment Questionnaire (UOLACICAQ)" instrument. The UOLACICAQ contained 27 items and was developed by the researchers. The instrument had sections, A, B and C. The demographic information of lecturers was captured in section A. Section B has 15 items on the extent of lecturers' use of online learning applications in classroom instruction while section C with 11 items covered lecturers' extent of use of online applications in classroom assessment. Sections B and C items were developed on a modified Likert type of 4-point scale ranging from Very High Extent, High Extent, Low Extent and Very Low Extent with numerical values of 4, 3, 2 and 1 accordingly. In making decisions, a mean value of 2.50 - 4.00 is accepted and below 2.50 is rejected.

2.4. Validity and Reliability

The instrument (UOLACICAQ) was validated by experts. To ensure the reliability of the instrument, 40 copies of the questionnaire were administered to 40 academic staff for trial testing. The subjects used in the trial testing were outside the study area and therefore were not included in the main study. Data collected were subjected to the Cronbach Alpha method. The internal consistency estimate for the instrument was calculated to be 0.93. The value was judged high enough to give confidence about the reliability of the instrument. The researchers and two research assistants administered the questionnaire to lecturers face-to-face.

2.5. Data Analysis

The data generated through the research instrument was analyzed using SPSS version 23.00 to conduct the statistical analysis. We first tested the normality of the data generated using Kolmogorov-Smirnov (K-S) test. The tests compared the scores in the sample to a normally distributed set of scores with the same mean and standard deviation; the null hypothesis is that sample distribution is normal. Since the p-value of the K-S test is greater than 0.05, this means that the frequency distribution corresponds to the normal distribution. The data is normally distributed (Table 2).

TABLE 2. Normality Test

Test Statistics	Statistics	p.Value
Kolmogorov-Smirnov test	0.08	0.782

This analysis involves the use of descriptive and inferential statistics [mean and standard deviation, t-test]. This analysis technique was chosen because this study evaluated the extent lecturers use information technologies in classroom instruction and assessment in post Covid-19 pandemic in Nigeria.

3. RESULTS

The result in Table 3 shows that the lecturers accepted using the identified online learning applications in items 1, 2, 3, 4, 7, 11 and 13 in their teaching since they have a mean greater than the criterion mean of 2.5. However, items 5, 6, 8, 9, 10, 12, 14, and 15 were not being used to a large extent by the lecturers in instructional delivery since they have means below the criterion mean of 2.5. The cluster mean of 2.46 shows that the lecturers use these online learning facilities to a low extent for instructional delivery in their institutions.

TABLE 3. Descriptive statistics of Lecturers' Use of Online Learning Applications in Classroom Instruction

S/N	Item Statement	Mean	SD
1.	I use Google to search for learning materials online	3.16	0.81
2.	I send/share information to students using email	2.89	0.87
3.	I use Moodle to teach/share instructional material with students	2.63	1.02
4.	I use Google classroom to teach/share instructional material with students	2.81	1.02
5.	I use Canvas to teach/share instructional material with students	2.20	1.05
6.	I use Microsoft Team to teach/share material with students	2.11	0.91
7.	I use Zoom in delivering lectures	3.11	1.12
8.	I use Google Meet in delivering lectures	2.01	0.88
9.	I use Cisco Webinar in delivering lectures	1.76	0.67
10.	I use Open Educational Resources (OERs) such as OER Common and Khan Academy to teach	1.89	1.08
11.	I use Google docs for collaborative learning	2.56	1.02
12.	I use Google slide for effective lesson delivery	1.93	0.97
13.	I use WhatsApp to teach/share instructional material with students	3.49	0.91
14.	I use Telegram Channel to teach/share material with students	2.26	0.97
15.	I use Facebook groups in teaching my students	2.11	1.07
	CLUSTER MEAN	**2.46**	

Note. N = 152

TABLE 4. Independent t-test analysis of lecturers' use of online learning application in classroom instruction

Gender	N	Mean	SD	df	t-cal	Sig. (2-tailed)
Male	88	2.53	0.69	150	1.071	0.286
Female	64	2.42	0.46			

The analysis in Table 4 shows that male lecturers had a slightly higher mean rating (2.53) as compared with their female counterparts (2.42). The result also shows that t(152-2) = 1.071, p = 0.286 was obtained in terms of lectures' use of online learning applications in classroom instruction based on gender. The p-value is greater than the level of significance of 0.05. The null hypothesis is retained, meaning that gender does not significantly influence lecturers' use of online learning applications in instructional delivery.

The result in Table 5 shows that the lecturers accepted item statements 19, 21 and 24; which means that they have been using those identified online learning applications for assessment purposes since they have means above 2.50. However, item statements 16, 17, 18, 20, 22, 23 25 and 26 were rejected since their mean ratings fall below the criterion mean of 2.50. This means that the lecturers were not using these identified online learning applications for assessment purposes in their colleges. The cluster means of 2.15 shows that overall, there is a low extent of lecturers' use of online learning applications for assessment purposes in their respective Colleges of education.

TABLE 5. Descriptive statistics of Lecturers' Use of Online Learning Applications in Classroom Assessment

S/N	Item Statement	Mean	SD
16	I use online learning management systems such as Moodle and Google Classroom to administer tests and assignments	2.01	0.75
17	I use online learning management systems such as Moodle and Google Classroom to mark/grade tests and assignments	1.95	1.07
18	I use Google forms in designing and administering quizzes/assignment	2.13	1.01
19	Most of my assignments are submitted via e-mail	2.84	0.88
20	I use Google sheet to process students' scores	1.55	1.15
21	My students' assessment records are stored in Google Drive	2.50	1.08
22	I use online learning management systems such as Moodle, Google Classroom, or Microsoft Teams to give feedback that improves students learning	2.15	1.24
23	Most of my assessments are scored automatically using the online learning applications	1.68	1.08
24	I use the WhatsApp application to share and receive assignments from student	2.63	1.09
25	I use Telegram Channel to share and receive assignments from students	1.95	0.89
26	I use Messaging applications such as WhatsApp, Telegram, Facebook, etcetera to publish students' results	2.21	0.95
	CLUSTER MEAN	**2.15**	

Note. N = 152

TABLE 6. Independent t-test Analysis of Lecturers' Uses of Online Learning Applications in Continuous Assessment by Gender

Gender	N	Mean	SD	df	t-cal	Sig. (2-tailed)
Male	88	2.91	0.67	150	4.239	.000
Female	64	2.48	0.56			

Table 6 shows that male lecturers had a higher mean rating (2.91) as compared with their female counterparts (2.48). The result also indicates that t(152-2) = 4.239, p = 0.000 (2-tailed) was obtained. The p-value is less than the 0.05 level of significance set for decision making. Thus, the null hypothesis is rejected, this means that gender significantly influenced lecturers' level of usage of online learning applications for continuous assessment.

4. DISCUSSION

The study considered the use of online learning applications for instructional delivery and assessment purposes in higher institutions of learning that stimulates a new atmosphere where lecturers could utilize these facilities to promote learning. The findings revealed that lecturers use WhatsApp to teach/share instructional material with students; use Google to search for learning materials online; use Zoom in delivering lectures; send/share information to students using email; use Moodle to teach/share instructional material with students; use Google classroom to teach/share instructional material with students, and use Google docs for collaborative learning. However, it was found that there was low extent of use of Canvas to teach/share instructional material with students; use of Microsoft Team to teach/share material with students; use of Google Meet in delivering lectures; use of Cisco Webinar in delivering lectures; use of Open Educational Resources (OERs) such as OER Common and Khan Academy to teach; use of Google slides for effective lesson delivery; use Telegram Channel to teach/share material with students, and use of Telegram Channel to teach/share material with students which all have their mean ratings below criterion benchmark of 2.5. Lecturers to a low extent use these online learning applications for classroom instructions. This result is surprising because these institutions are teachers' training institutions where these facilities should be used adequately for classroom instructions but it was not the case. Also, considering the global disruption as a result of COVID-19, which has pushed most institutions around the world to adopt the online learning platforms for their instructional delivery (Adedoyin, & Soykan, 2020; Agormedah et al., 2020), it was expected that Nigerian teachers training institutions (Colleges of Educations) should have been a leader in adoption and usage of these platforms among the Nigerian higher institutions of learning. The plausible reason for this could be institutional issues such as lack of motivation for lecturers who adopted this technology for classroom instruction; electricity or lack of adequate training for lecturers to use these platforms for classroom instructions. The report of (Sánchez-Caballé et al., 2019) collaborates with the present study finding. The authors states that students make limited use of technology in learning, they are very predisposed to integrate it in their work. The result of this study aligns with that of Yushau and Nannim (2020) who found out that lecturers' level of utilizing ICT resources for teaching purposes is low. This result also agreed with Aworanti (2016) who found that there was low utilization of ICT facilities for classroom instruction. However, it disagrees with Olokooba and Abdulsalam (2017) that found a higher extent of utilization of ICT in classroom instruction among teachers. The result also differs with the report of (Villares, & Sánchez, 2022) who discovered a high degree of acceptance of these media in arts education, a great variety of uses, and commitment towards lifelong learning.

Lecturers'gender does not significantly influence' use of online learning applications in instructional delivery. Male and female lecturers did not differ in their opinions on the use of online learning applica-

tions for instructional delivery in colleges of education. This result strengthens the report of Onwuagboke and Singh (2016) who revealed no significant gender influence in ICT usage in instructional delivery. Similarly, the result of Yushau and Nannim (2020) found no significant gender difference in the use of ICT in teaching. However, it disagrees with the report of Umar (2010) and Adekeye (2008) which shows that a significant difference existed. Male lecturers were found to use ICT facilities most as compared to their female counterparts (Mahdi, & Al-Dera, 2013). The present study findings contradict the study of Rodrigo et al. (2018) where women plan and get more out of study time, provide an intrinsic motivation for learning, have a marked preference for doing work and study with other colleagues, discuss doubts and ask for help from both peers and teachers.

Lecturers have been using online learning applications for submission of assignments via e-mail; storage of students' assessment records via the Google drive, and also use WhatsApp application to share and receive assignments from students. These items all have means above the benchmark. However, it was also found that the use of online learning management systems such as Moodle and Google Classroom to administer tests and assignments; use of online learning management systems such as Moodle and Google Classroom to mark/grade tests and assignments; use of Google forms in designing and administering quizzes/assignments; use of Google sheet in processing students' scores; use of online learning management systems such as Moodle, Google Classroom, or Microsoft Teams to give feedback that improves students learning; the automatic scoring of assessments; use Telegram channel/group to shared and receive assignments from students; use Messaging application such as WhatsApp, Telegram, Facebook, etcetera to publish students results were being used by the lecturers to a low extent. This finding is consistent with the result of Jotia and Matlale (2011) who found a low extent of utilization of ICT in classroom assessment. The study disagrees with Ojerinde (2009) who found that lecturers were using ICT for classroom assessment in their institutions.

The result further revealed that male and female lecturers are significantly different in terms of using online learning applications for classroom assessment. This result agrees with the findings of Umar (2010) and Adekeye (2008) however, it disagrees with Salman et al. (2013) who found that gender does not influence lecturers' use of digital technologies in classroom assessment. The authors attributed these findings to factors such as enabling environment for the usage of ICT in the institution or individual factors such as lack of will to use the ICT facilities for classroom instructions. The results obtained with the research could be useful to improve the training of lecturers in online learning applications utilization in instructional delivery and assessment purposes in high institutions of learning.

5. CONCLUSIONS

The result shows low utilization of online learning applications in the classroom for instructional delivery by lecturers in Nigeria. Male and female lecturers do not differ in terms of the extent to which they use online learning applications while delivering instructions in the classroom. The result of this study also revealed that lecturers utilize online learning applications in the process of classroom assessment to a high extent. Male lecturers significantly utilize online learning platforms in the process of assessment more than female lecturers. This result means that more effort is required by lecturers with respect to adopting online learning

platforms in the process of instructional delivery and assessment within the classroom environment since it is indispensable in the world of academics and considering the global disruption caused by the COVID-19 pandemic. Based on the findings, it was recommended amongst others that stakeholders in education should ensure adequate training for lecturers on how to use these platforms for instructions and assessment. This could be done quarterly. The online learning platforms should be made accessible to lecturers by providing them with all the required licenses.

5.1 Limitations and future lines of research

Lecturer characteristics may limit the result of the study. Some lecturers can be more effective and dedicated in the use of online learning applications than others. This could influence the outcome of this study, and as such a limitation to the findings of the study. Also, the study data relied on questionnaire which are self-report instruments, capable of generating subjective response. Thus, findings of this study may be further verified using interviews, open-ended questions and focused group discussions. We noted the inability to conduct a confirmatory validity of the two dimensions of the instrument (exploratory analysis and confirmatory analysis). On this note, other researchers should investigate further using exploratory and confirmatory factor analysis in exploring online learning applications in instructional delivery and classroom assessment among postgraduate lecturers and students. The generalizability of the findings of this study may be limited due to the sample size. Thus, the researchers suggested that future researchers can replicate the study and employ large sample size. With these limitations, the generalization of these findings should be done with caution. It was only moderating influence of gender of participants that was determined among several demographic variables. The moderating effects of demographic variables like age, qualifications, school type, ethnicity, and state of origin were not determined. Given these limitations, we encourage future studies to consider the demographic variables moderating the lecturers online learning applications in classroom instruction and assessment. A replication of this study on a wider geographical area to include students in Secondary schools and Universities.

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