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# COLLABORATIVE TECHNOLOGY ADOPTION IN TEACHING LIBRARY AND INFORMATION SCIENCE IN NIGERIAN UNIVERSITIES

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**Abstract** *The study descriptively examined lecturers' adoption of collaborative technologies in teaching Library and Information Science (LIS) in ten public universities in South-South Nigeria, using a population and a sample of ninety-five LIS lecturers and seventy-five LIS lecturers respectively. A questionnaire served as a tool for data gathering. Lecturers in LIS and in Measurement and Evaluation confirmed the instrument valid. Ninety-five questionnaire copies were administered to the lecturers, out of which seven-five copies were retrieved and found amenable for analysis. The response rate was 78.95%. Data were analysed by means of weighted mean and standard deviation. It unfolded that the extent to which the lecturers adopted collaborative technologies to teach LIS was low; the purposes for which the lecturers adopted the technologies to teach LIS were to deliver lectures and to distribute course contents to students with benefits including enabling the lecturers to stay up-to-date, to easily share course content to students, to conveniently exchange information with students, and to develop digital skill. Despite this, insufficiency of information and communication technology (ICT) facilities, unstable internet connectivity, irregular power supply, poor funding and poor ICT skill to operate the technologies prevented the lecturers from maximizing the technologies for pedagogy.*

**Keywords:** *Adoption, Collaborative Technologies, Teaching, Library and Information Science, Public Universities, South-South Nigeria*

## INTRODUCTION

Several useful innovations have emerged in the 21st century, one of the greatest of which could be regarded as information and communication technology. Information and communication technology (ICT) may be viewed as electronic facilities which ease the process of translating data into information and manipulating it to meet needs for planning, decision making, critical thinking, imparting and gaining knowledge and so on. It is viewed as a varying group of technological equipment and resources such as computers, Internet, live and recorded broadcasting technologies and telephony, which are employed to send, keep, produce, distribute or exchange information (Amie-Ogan & Nwosu, 2023). ICT has tremendously facilitated individual, organisational, institutional, corporate and societal activities. At the individual level, ICT has greatly enhanced teaching and learning. The means by which knowledge is imparted to an individual is referred to as teaching, whereas, learning may be conceived as the process by which an individual or a group of individuals becomes aware of himself and his environment. Teaching has been seen as any action intended to make another individual to learn (Mbah & Umurhurhu, 2016). The individual who imparts knowledge is called the teacher while the individual to whom knowledge is being imparted is called the learner, pupil or student. Traditionally, teaching takes place in the classroom where the teacher physically interacts with the learner(s). However, the advent of ICT has changed the teaching process in educational institutions. With this change, teachers have been empowered to approach the teaching process differently.

It has been acknowledged that, globally, academics now facilitate and build learning environments rather than just disseminate knowledge (Bubou & Job, 2021). This shift has been occasioned by the adoption of diverse forms of ICT to enhance teaching-learning process in institutions of learning, especially in tertiary institutions of learning. This shift is very visible in universities whose original target is to teach, groom and safeguard culture (Altbach, 2011) as well

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as to reproduce societal intellect and to improve literacy in society (Pillay & Jarbandhan, 2023). The teaching-learning process has, traditionally, been an interactive or collaborative process whereby teachers and students work together to create an informed citizenry. However, recent teaching practices in higher educational institutions tend to phase out physical presence of the teacher and the students. For example, research has attested to the adoption of online teaching, laptop-based teaching and web-based teaching in public and private universities in Central Punjab, Lahore, Pakistan, with laptop-based teaching activity mostly adopted, followed by web-based teaching activities and lastly, online teaching activities (Afridi & Chaudhry, 2019). In the same vein, research demonstrates that 70% Universiti Utara Malaysia lecturers have put social media to such instructional uses as teaching and discussing online (Hashim & Zamani, 2015). The same thing is applicable to Nigerian university lecturers who have shifted from the use of manual teaching techniques to technologically-based instructional methods just as their European, American, Asian, Australian and other African counterparts do (Bubou & Job, 2021). In terms of application of technologically-based teaching methods in courses of study in tertiary institutions of learning, Library and Information Science (LIS) departments, teachers and students have been said to be adopting emerging technologies to introduce the best practices in pedagogy (Alonge, 2018). This has been largely achieved by digitalization and use of innovative electronic-based technology, which are said to characterise 21st century education (Gold & Vitalis, 2023).

One of the emerging ways by which innovative electronic-based technology usage for educational purpose is made possible is through the adoption of collaborative technologies. Rogers (2003) sees adoption as the process by which an individual chooses to use an innovation as the best available alternative for taking an initiative. Rogers opines that this process begins by hearing about an innovation followed by its use. On the other hand, collaboration is conceived as the process whereby an individual works with one or more people so as to produce or create something (Lomas, 2008). Technology may be defined as any man-made device or tool which makes a task or a job easy and efficient. Collaborative technologies could be described as electronic devices which, regardless of distance or geographical location, enable a teacher to have a close interaction with his students so as to impart knowledge to them effortlessly and efficiently. Two forms of collaborative technologies have been identified: collocated collaborative technologies, which facilitate team work in one locality, and non-collocated collaborative technologies, which ease joint task from different places (Igwela et al., 2022). Collaborative technologies include institutional repositories, integrated library systems, library thing, LinkedIn, Facebook, WhatsApp, blogs, Wikis, instant messaging, mobile phones, digital board, email, etc. (Igwela et al., 2022). Ogudu (2023) observes that open-source web 2.0 tools (e.g. WhatsApp, Facebook, You-tube), virtual conferencing platforms (Zoom, Google Meet, etc.) and learning management system (Google classroom, Moodle and so on) empower lecturers to create classes, post announcement, give assignment/quiz and receive feedback, whereas, they enable students to interact and share learning materials in their different departmental group platforms. University teachers around the globe have been utilizing collaborative technologies for instructional purposes, and researchers have been making efforts to unravel issues surrounding this process.

## STATEMENT OF THE PROBLEM

In recent years, teachers in higher institutions of learning, particularly universities, appear to have grown increasing interest in having a close interaction with their students in order to impart knowledge more effectively. As a result, they tend to have taken advantage of collaborative technologies to instruct students. Some of these technologies include digital whiteboard, LinkedIn, Facebook, WhatsApp, blogs, Wikis, email, YouTube, Zoom, Google Meet, Google classroom, Moodle and so on. The use of these technologies for teaching purposes appears to help higher education teachers to easily and quickly send course-related information to students, to have better communication with students, to instruct students remotely and conveniently and to have a closer interaction with students. A number of studies have examined the adoption of collaborative technologies for instructional purposes by university teachers around the globe. In Nigeria, only the study by Okiki and Gbemi-Ogunleye (2021) seems to have examined LIS lecturers' adoption of social networking tools for teaching task. However, this research engaged LIS lecturers in public universities in South-West Nigeria. The available related studies from South-South Nigeria have only looked at the possibility of utilizing social media for lecturer-student communication in Nigerian public universities and polytechnics in the aftermath of COVID-19 in Nigeria (Olannye-Okonofua & Oji, 2023); how collaborative technologies were adopted to teach Commercial Education at Ignatius Ajuru University of Education and Rivers State University, Nigeria (Atah et al., 2023); and how same technologies were utilised for knowledge sharing among library educators in public tertiary institutions in Rivers State, Nigeria (Igwela et al., 2022). A cursory look into past research shows that no study has specifically thrown light on whether lecturers in public universities in South-South Nigeria utilize collaborative

technologies to teach Library and Information Science. Hence, this research investigated lecturers' adoption of collaborative technologies in instructing students about Library and Information Science in South-South Nigerian government-owned universities.

## PURPOSE OF THE STUDY

The study was primarily intended to figure out issues related to instructional adoption of collaborative technologies by Library and Information Science teachers in South-South Nigerian government-owned universities. It separately:

- Ascertained the extent to which lecturers adopt collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities;
- Assessed the purposes for which lecturers adopt collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities;
- Determined the gains lecturers derive from adopting collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities;
- Identified the barriers faced by lecturers in adopting collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities.

## RESEARCH QUESTIONS

The questions underneath were generated to keep the study in track:

- To what extent do lecturers adopt collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?
- For what purposes do lecturers adopt collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?
- What benefits do lecturers derive from adopting collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?
- What barriers are faced by lecturers in adopting collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?

## REVIEW OF RELATED LITERATURE

### Extent of Lecturers' Adoption of Collaborative Technologies in Teaching Library and Information Science in Universities

Research findings suggest different degrees to which Library and Information Science lecturers and other teaching staff in universities have been adopting collaborative technologies to teach students. A good number of results tend to indicate that university teachers extensively use collaborative technologies for teaching purposes. For instance, research demonstrates that 70% of 123 Universiti Utara Malaysia lecturers have commenced using social media to instruct students (Hashim & Zamani, 2015). In the same year, a high extent of adoption of video/teleconferencing, learning management system, e-mail, interactive white board, etc. for pedagogy was linked with twenty-six Commercial Education teachers in government-owned universities in Enugu State of Nigeria (Anetu et al., 2015). Three years later, a high extent of adoption of learning management system (LMS) was also associated with lecturers at King Fahd University of Petroleum and Minerals and Dammam Community College in Eastern Saudi Arabia (Alonge, 2018). In another study, Microsoft Teams platform was widely accepted by teaching staff of a UK university, which changed to emergency remote teaching for a major second-year engineering-based entrepreneurship module (Lambert & Rennie, 2021). In the same year, online communication between students and 12 Master of Health Services Administration (MHSA) program lecturers at the University of Kansas Medical Center was found to be gaining momentum during the outbreak of COVID-19 (Brooks et al., 2021). In the event of the same disease, a sharp rise in the adoption of synchronous online communication devices, particularly, video-conferencing systems and social networking tools, and a drop in the use of interactive whiteboards by 268 university Italian teachers was reported (Pozzi et al., 2023). From a study of the possibility of adapting social media for lecturer-student communication in the aftermath of covid-19 in Nigeria, the same year is associated with the result showing that 15 lecturers of twelve Nigerian public universities and polytechnics in South-South, South-East and South-West Nigeria, make significant use of social media for communication with their students (Olannye-Okonofua & Oji, 2023). On the contrary, very few studies seem to indicate that the extent to which tertiary education teachers employ collaborative tools to instruct students is low. Empirical evidence shows that 23% of 127 lecturers who teach in the academic domains of

Management, Arts and Culture, Islamic Studies and Arabic Language and Technology at South-Eastern University of Sri Lanka, employ collaboration tools with Moodle for pedagogy (Hasmy, 2020). Three years later, Atah et al. (2023) unraveled that a sample of 38 university lecturers do not make effective utilisation of Pinterest, TikTok, and LinkedIn in instructing students about Business Education at Ignatius Ajuru University of Education and Rivers State University, Nigeria. In the field of science, it was brought to light that all the Electrical Engineering lecturers in Nigerian Universities seldom harness virtual laboratories to impart knowledge to students (Isaac et al., 2023).

## Purposes of Lecturers' Adoption of Collaborative Technologies in Teaching Library and Information Science in Universities

Research has pointed out the purposes for which university teachers employ collaborative tools for instruction. In the context of university education, information and communication technologies (ICTs) are said to be used to develop and share course content, create and deliver lectures and presentations, etc (Mondal & Mete, 2012). These applications of ICT have also been associated with the learning management system. Goh et al. (2014) noted that teachers utilise the learning management system to distribute course content and instructional materials to students and to encourage students to work together and participate by means of virtual platforms. Similarly, it has been acknowledged that the same system has potentials for building online course content, for enhancing critical thinking competences, and for motivating university-based academic students' team task (Zanjani et al., 2016). A number of empirical findings also provide a hint on areas in which university teachers apply collaborative technologies in the instructional process. For instance, just over half a sample of 68 Makerere University lecturers in Uganda in Africa were found to have adopted web 2.0 technologies to develop course materials, to provide online distance education, to publicize information to students and to assess students (Okello-Obura & Ssekitto, 2015). In the following year, two ICT lecturers and five non-ICT lecturers at the University of Education, Winneba, Ghana, were found to have applied MOODLE to create and deliver lessons as well as to chat with students in the pre-and-post-physical classroom lessons (Sarfo & Yidana, 2016). Result also emerged from five Tanzanian universities that a sample of 47 lecturers in these universities adopt Web 2.0 technologies to partake in academic talks, to post, to source for lecture slides and tutorials, to share materials and to publish their research results (Kazoka & Mwantimwa, 2019). An accompanying result linked 215 lecturers in the University of Ibadan and Covenant University, Nigeria, with using, among others, personal computers, the Internet, multimedia projectors and PowerPoint for lecture note preparation. On the other hand, mobile phones, electronic mails, Moodle and Twitter were found to have been used for teacher-student communication while a few lecturers used email to received students' research essays, term papers and assignments (Bubou & Job, 2021). In a subsequent study, the most instructional techniques adopted by 268 Italian university teachers during the time of Corona Virus were discussion and brainstorming, whereas, case study, peer review and role play were moderately employed as against Pyramid and Jigsaw which were less-commonly employed, particularly in a physical learning mode (Pozzi et al., 2023).

### Benefits in Lecturers' Adoption of Collaborative Technologies in Teaching Library and Information Science in Universities

A number of studies have established the gains university teachers derive from using collaborative tools to teach students. For instance, using technology for remote teaching has been acknowledged to have offered numerous advantages, including enabling students' participation, providing access to the latest information, easing distribution of content and communication (Matthew & Iloanya, 2016). Empirical result hints that two ICT lecturers and five non-ICT lecturers at the University of Education, Winneba, Ghana, became resourceful and up-to-date as they adopted MOODLE for instruction (Sarfo & Yidana, 2016). What followed was a finding suggesting that pedagogical application of web 2.0 technologies enabled five Tanzanian university teachers to organize documents and academic materials; to link to relevant materials; to be more accountable, and to think and argue critically (Kazoka & Mwantimwa, 2019). In a following study, 305 preschool, basic and secondary school teachers in Portugal attested to acquiring digital skills in adopting emergency remote teaching and learning in the space of the first COVID-19 lockdown (Seabra et al., 2021). In the same year, Okiki and Gbemi-Ogunleye (2021) found that the use of social networking technologies for pedagogy helped thirty-seven Library and Information Science teachers in South-West Nigerian universities to deliver online lectures, to narrow the gap in their communication with students and to have more publications. Similar subsequent findings show that the migration to online teaching by 12 Master of Health Services Administration (MHSA) program lecturers at the University of Kansas Medical Center during the COVID-19 crisis was beneficial in, among others, deepening their personal interactions with students (Brooks et al., 2021). In another study, the adoption of blended teaching and

learning by twenty lecturers at the University of Lesotho was found to have put learners at the centre of the learning process (Nkhi et al., 2023). In the same year, a sample of 84 Computer Science lecturers in four public tertiary institutions in Enugu State, Nigeria, attested that online assessment techniques enabled them to timely monitor students' progress and to give instant feedback to students (Lu et al., 2023). A bibliometric research result by Fernandez-Batanero et al. (2023) shows that the Internet of Things is advantageous not only in integrating information and communication technology into classrooms, but also in increasing learners' interest.

## Challenges Faced by Lecturers in using Collaborative Technologies in Teaching Library and Information Science in Universities

Research has revealed that some factors impede the adoption of collaborative tools for teaching processes in universities. In an empirical research, two ICT lecturers and five non-ICT lecturers at the University of Education, Winneba, Ghana, were found to have encountered difficulty in designing and developing MOODLE (Modular Object-Oriented Dynamic Learning Environments) oriented-courses primarily because of low technology competencies, demanding institutional culture and lack of sufficient ICT facilities (Sarfo & Yidana, 2016). In the following year, Pima and Mtui (2017) found that the five major challenges faced by 120 Tanzanian higher education lecturers in embracing collaborative web technologies for teaching engagement are lack of a directional framework on collaborative web technologies; lack of information and communication technology policy on these technologies; unreliable information and communication technology infrastructure; lack of awareness; and poor internet connection. On the other hand, the obstacles encountered by Makerere University lecturers in using web 2.0 tools for instructional activities were high internet subscriptions or low internet band width; lectures' fears of technology; rising cybercrimes; poor training in ICT applications; lack of time to adopt the technologies; lack of ICT facilities for learners' adoption; low staff strength and lack of their inspiration by the university (Okello-Obura & Ssekitto, 2015). Four years later, lack of technical expertise and discomfort with openness and public discourse and interactions were found to have prevented a sample of 38 Business Education lecturers at Ahmadu Bello University, Kwara State University, Tai Solarin University of Education, Ijagun and Ekiti State University, Nigeria, from adopting web tools for teaching engagement (Mamman, 2019). In the year that followed, a bibliometric study, which involved analysis of electronic teaching papers published in the era of Corona Virus crisis, identified the challenges faced by academics and students in adopting online pedagogical practices during the period to include, among others, the inability to access or use the online learning and teaching tool; stress; depression and anxiety (Mseleku, 2020). In another study, 305 preschool, basic and secondary school teachers in Portugal were not able to effectively implement emergency remote teaching and learning (ERTL) during the first COVID-19 lockdown mainly due to poor infrastructure and lack of digital competence (Seabra et al., 2021). In addition, 25 lecturers in four public universities in Afghanistan (Bamyan University, Kunduz University, Kabul University and Herat University) could not make effective utilization of higher education learning management system (HELMS) as a result of lack of well-defined steps; lack of dedication; resistance to change, low level of lecturers' readiness in sharing HELMS operational expertise and low level of regard for leadership structures (Mohammadi et al., 2021). It was also found that the hindrances to smooth knowledge sharing among sixty library educators in four public tertiary institutions in Rivers State of Nigeria are lack of facilities, absence of policy and non-cooperation among the teachers (Igwela et al., 2022). In a fairly-current study, higher education teachers were found to have experienced difficulty in adopting the Internet of Things owing to their attitude to its usage and level of their digital skills (Fernandez-Batanero et al., 2023). In the same year, Gold and Vitalis (2023) discovered that a sample of 22 lecturers in two public universities (state and federal university) in Enugu State, Nigeria, found it hard to apply blended teaching strategies in Business Education owing to students' class size; lack of staff to provide technical support; nature of curriculum content to deliver; poor power supply; insufficient knowledge of pedagogical instructional technologies; absence of motivational packages for instructing students; punitive university social media use policy, lack of time, etc.

## METHODS

The study was premeditated to be executed descriptively. This design was adopted on the premise that the research was targeted at gathering and interpreting the views of lecturers on issues revolving around their adoption of collaborative technologies in imparting knowledge to students about Library and Information Science (LIS). This is in line with Nworgu's (2015) assertion that a survey research design is intended to glean and systematically describe information and facts about a given population. The study population was ninety-five LIS lecturers in ten South-South Nigerian government-owned universities. Total enumeration method of sampling was employed to select a sample of seventy-five LIS lecturers. This sampling technique was adopted because all elements of the population could be engaged in the research.

Questionnaire was used to source for data. It was partitioned into Section A and B. Section A sought information on the personal profile of the study respondents, while Section B had four clusters: A, B, C and D. Cluster A dealt with "Extent to which Lecturers Adopt Collaborative Technologies to Teach LIS"; Cluster B with "Purposes for which Lecturers Adopt Collaborative Technologies to Teach LIS", Cluster C covered "Benefits Lecturers Derive from Adopting Collaborative Technologies to Teach LIS, while Cluster D centred on "Barriers Lecturers Encounter in Adopting Collaborative Technologies to Teach LIS". Cluster A, which had thirteen items, was weighted on a scale of "Very Great Extent (4)", "Great Extent (3)", "Low Extent (2)" and "Very Low Extent (1). Cluster B, which contained four items, was weighted on a scale of Agree (2) and Disagree (1); while Cluster C and D with five items and seven items respectively, were both weighted on scale of "Strongly Agree (4)," "Agree (3)", "Disagree (2)" and "Strongly Disagree (1)".

Two senior LIS lecturers and a Measurement and Evaluation lecturer at Niger Delta University, Bayelsa State, Nigeria, attested to the validity of the questionnaire. The instrument was, however, not pilot-tested based on the assertion that a valid instrument tends to be reliable (Nworgu, 2015). Ninety-five questionnaire copies were shared to the lecturers in person with the aid of research assistants in the university libraries. Immediate collection of completed questionnaires in person, collection by proxy and by courier service was adopted by the researchers. Two months was spent on data gathering. A total of seven-five questionnaire copies were finally retrieved and found amenable for analysis. This amounted to 78.95% response rate. The researchers made use of weighted mean and standard deviation to analyse the data obtained.

Criteria points of 2.50 for Cluster A, C and D and 1.50 for Cluster B were established. It was decided that Cluster A items with weighted means less than 2.50 would be regarded as "Low Extent" while those with means equal to or greater than 2.50 would be considered as "Great Extent". Items in this cluster whose means fell within the limits of "3.50-4.49", 2.50-3.49, 1.50-2.49 and "0.50-1.49" would be regarded as "Very Great Extent", "Great Extent", "Low Extent" and "Very Low Extent" respectively. The aggregate mean for this cluster was also explained in a similar manner. As for Cluster B, items with means less than 1.50 would be regarded as "Disagreed", while items with means equivalent to or greater than 1.50 would be regarded as "Agreed". With respect to Cluster C, items with weighted means less than 2.50 would be considered as "Disagreed", whereas, those with means equal to or greater than 2.50 would be viewed as "Agreed". Items in this cluster whose means were found within the boundaries of "3.50-4.49", 2.50-3.49, 1.50-2.49 and "0.50-1.49" would be taken to mean "Strongly Agree, "Agree", "Disagree" and "Strongly Disagree". This decision rule was extended to interpretation of results under Cluster D.

## RESULTS

This part of the study tabulated the fallouts of the research in accordance with the research questions earlier generated to keep the study in focus.

*Research Question 1:* To what extent do lecturers adopt collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?

**Table 1: Mean Ratings of Responses on Extent to Which Lecturers Adopt Collaborative Technologies to Instruct Students About Library and Information Science in South-South Nigerian Government-Owned Universities**

| Sr. No. | Items | Mean | Standard Deviation | Remark |
|---|---|---|---|---|
| 1. | interactive digital white board | 1.48 | 0.15 | VLE |
| 2. | Google classroom/Meet | 2.45 | 0.45 | LE |
| 3. | LinkedIn | 1.24 | 0.12 | VLE |
| 4. | Facebook | 1.31 | 0.13 | VLE |
| 5. | Moodle | 2.49 | 0.25 | LE |
| 6. | WhatsApp | 3.34 | 0.33 | GE |
| 7. | Twitter | 2.47 | 0.25 | LE |
| 8. | Telegram | 2.45 | 0.25 | LE |
| 9. | blogs | 0.58 | 0.06 | VLE |
| 10. | Wikis | 0.55 | 0.06 | VLE |
| 11. | Electronic mail | 3.55 | 0.36 | VGE |
| 12. | YouTube | 1.45 | 0.15 | VLE |
| 13. | Zoom | 2.35 | 0.24 | LE |
| | Grand Mean and Standard Deviation | 1.98 | 0.20 | LE |

Note: VGE (Very Great Extent); GE (Great Extent); LE (Low Extent); VLE (Very Low Extent)

Table 1 indicates that the grand mean of 1.98 falls within the limit of 1.50-2.49 which was previously set as "Low Extent". Thus, Library and Information Science teachers in South-South Nigerian government-owned universities adopt collaborative technologies for instructional purposes to a low extent.

*Reseach Question 2:* For what purposes do lecturers adopt collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?

**Table 2: Mean Ratings of Responses on Purposes for Which Lecturers Adopt Collaborative Technologies to Instruct Students About Library and Information Science in South-South Nigerian Government-Owned Universities**

| Sr. No. | Items | Mean | Standard Deviation | Remark |
|---|---|---|---|---|
| 1. | I use collaborative technologies to develop course content. | 1.35 | 0.14 | Disagree |
| 2. | I utilise collaborative technologies to deliver lectures to students. | 1.77 | 0.18 | Agree |
| 3. | I adopt collaborative technologies to distribute course content to students. | 1.89 | 0.19 | Agree |
| 4. | I adopt collaborative technologies to assess students. | 1.24 | 0.12 | Disagree |
| | **Grand Mean and Standard Deviation** | **1.56** | **0.16** | **Agree** |

Table 2 reveals that Library and Information Science teachers in South-South Nigerian government-owned universities apply collaborative technologies to deliver lectures and share course contents with students. However, the lecturers do not use the technologies to develop course content and to assess students.

*Research Question 3:* What benefits do lecturers derive from adopting collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?

**Table 3: Mean Ratings of Responses on Benefits Lecturers Derive from Adopting Collaborative Technologies to Instruct Students About Library and Information Science in South-South Nigerian Government-Owned Universities**

| Sr. No. | Items | Mean | Standard Deviation | Remark |
|---|---|---|---|---|
| 1. | Collaborative technology usage for teaching enables me to have access to the latest information. | 3.44 | 0.34 | Agree |
| 2. | Collaborative technology utilization for instruction helps me to distribute course content to students easily. | 4.14 | 0.41 | Agree |
| 3. | Pedagogical collaborative technology adoption facilitates my communication with students. | 4.18 | 0.42 | Agree |
| 4. | Using collaborative technology to teach students makes me a resourceful teacher. | 1.55 | 0.16 | Disagree |
| 5. | Utlising collaborative technology for teaching purpose enables me to acquire digital skills. | 2.47 | 0.25 | Agree |
| 6. | Grand Mean and Standard Deviation | 3.16 | 0.32 | Agree |

Table 3 reveals that lecturers who educate students about Library and Information Science (LIS) in South-South Nigerian government-owned universities are opportune to stay up-to-date, to easily share course contents with students, to have easy communication with students, and to develop digital competence when they adopt collaborative technologies to teach LIS.

*Research Question 4:* What barriers are faced by lecturers in adopting collaborative technologies to instruct students about Library and Information Science in South-South Nigerian government-owned universities?

**Table 4: Mean Ratings of Responses on Barriers Faced by Lecturers in Adopting Collaborative Technologies to Instruct Students About Library and Information Science in South-South Nigerian Government-Owned Universities?**

| Sr. No. | Items | Mean | Standard | Remark |
|---|---|---|---|---|
| 1. | Inadequate ICT facilities | 4.18 | 0.42 | Agree |
| 2. | Lack of supporting policy framework | 2.46 | 0.25 | Disagree |
| 3. | Lack of awareness of collaborative technologies | 2.43 | 0.24 | Disagree |
| 4. | Unstable internet connectivity | 3.47 | 0.35 | Agree |
| 5. | Poor funding | 4.34 | 0.43 | Agree |
| 6. | Unstable power supply | 4.15 | 0.42 | Agree |
| 7. | Poor ICT skill | 2.55 | 0.26 | Agree |
| | Grand Mean and Standard Deviation | 3.23 | 0.32 | Agree |

Table 4 shows that lecturers who use collaborative technologies to teach students about Library and Information Science in South-South Nigerian government-owned universities find the process difficult because of shortage of ICT facilities, oscillating internet connectivity, irregular power supply, poor funding and poor digital ICT skills. On the other hand, lack of supporting policy framework and ignorance of collaborative technology do not present challenges.

## DISCUSSION

The study has demonstrated that Library and Information Science (LIS) lecturers in South-South Nigerian public universities adopt collaborative technologies for teaching purposes to a low extent. The result is in line with findings suggesting that 23% of 127 lecturers who teach in the faculties of Management, Arts and Culture, Islamic Studies and Arabic Language and Technology at South-Eastern University of Sri Lanka, apply Moodle to impart knowledge to students (Hasmy, 2020); that all Nigerian Electrical Engineering lecturers seldom use virtual laboratories to instruct students (Isaac et al., 2023); and that there was a decline in the adoption of interactive whiteboards by Italian university teachers in the event of the Corona Virus (Pozzi et al., 2023). On the contrary, the outcome disagrees with previous studies associating 70% of 123 Universiti Utara Malaysia lecturers with pedagogical application of social media (Hashim & Zamani, 2015); lecturers at King Fahd University of Petroleum and Minerals and Dammam Community College in Eastern Saudi Arabia with high degree of utilsation of learning management system for instructional purposes (Khan & Adams, 2016); 26 Business Education teachers in government-owned universities in Enugu State, Nigeria with high extent of adoption of video/teleconferencing, learning management system, electronic mail and interactive white board (Anetu et al., 2020); Italian university teachers with massive pedagogical use of video-conferencing systems and social networking tools during the COVID-19 pandemic (Pozzi et al., 2023); and Nigerian South-South, South-East and South-West Nigerian public tertiary education teachers with significant social media pedagogical adoption (Olannye-Okonofua & Oji, 2023). The low utilisation of collaborative technologies for instructional purposes by the lecturers in the current research could be as a result of their tendency to prioritise the use of manual or traditional teaching methods.

The research has also shown that the lecturers adopt collaborative technologies to deliver lectures and to share course contents with students. However, the lecturers do not use the technologies to develop course content and to assess students. The finding aligns with the observation that teachers use the learning management system to share course content and instructional materials to students (Goh et al., 2014). The finding also corresponds with the result that lecturers at the University of Ibadan and Covenant University, Nigeria, use mobile phones, electronic mails, Moodle and Twitter to communicate with students (Bubou & Job, 2021). In contrast, the result disagrees with the outcome that Makerere University lecturers take advantage of web 2.0 technologies to create lecture materials and to assess students (Okello-Obura & Ssekitto, 2015). While it is consistent with the result that two Information and Communication Technology (ICT) lecturers and five non-ICT lecturers at the University of Education, Winneba, Ghana, adopt MOODLE to deliver lessons as well as to chat with students before and after physical classroom lessons, it, however, disagrees with a part of the result that the lecturers adopt MOODLE to create lectures (Sarfo & Yidana, 2016). The finding also corresponds with finding that lecturers at the University of Ibadan and Covenant University, Nigeria, use mobile phones, electronic mails, Moodle and Twitter to communicate with students (Bubou & Job, 2021). Moreso, it is out of tune with the observation by Zanjani et al. (2016) that the learning management system can create online course content. Delivering lectures and providing students with course materials appear to be core aspects of teaching

task in Nigerian universities. This could be responsible for this current finding.

Furthermore, findings suggest that the lecturers were opportune to stay up-to-date, to easily share course contents with students, to have easy communication with students, and to develop digital competence when they adopted collaborative technologies to teach LIS. This affirms the remark that the application of technology for remote teaching promotes access to the most current information, facilitates distribution of course content and communication (Mathew & Iloanya, 2016). In addition, it tallies with result that Portuguese elementary and secondary school teachers were able to acquire digital skills owing to their adoption of emergency remote teaching during the first COVID-19 lockdown (Seabra et al., 2021). Although it aligns with finding suggesting that MOODLE adoption for pedagogy by ICT lecturers and non-ICT lecturers at the University of Education, Winneba, Ghana, helps them to keep abreast of the most current information, the present result disagrees with another part of the finding that such application makes them resourceful (Sarfo & Yidana, 2016). It also tallies with result showing that same application provides South-West Nigerian universities' Library and Information Science lecturers with opportunities to hold online classes with learners, to easily reach out to their students and to produce more research output (Okiki & Gbemi-Ogunleye, 2021). Collaborative technologies often serve as a means of knowledge and information sharing and this could explain this result of the study.

Lastly, the research uncovered that the LIS lecturers find it hard to adopt collaborative technologies to instruct students due to shortage of ICT facilities, oscillating internet connectivity, irregular power supply, poor funding and poor digital ICT skills. On the other hand, lack of supporting policy framework and ignorance of collaborative technology do not present challenges. This outcome bears semblance with result indicating that the adoption of web 2.0 tools for teaching endeavor by Makerere University lecturers is obstructed by low internet bandwidth and poor training in ICT applications (Okello-Obura & Ssekitto, 2015). It is also in consonance with outcome suggesting that ICT and non-ICT lecturers at the University of Education, Winneba, Ghana, encounter obstacles in creating MOODLE-based courses mainly due to low technology skills and shortage of ICT facilities (Sarfo & Yidana, 2016). Similarity can also be drawn with finding that lack of technical skill hinders Business Education lecturers at Ahmadu Bello University, Kwara State University, Tai Solarin University of Education, Ijagun and Ekiti State University, Nigeria, from adopting web tools for teaching practices (Mamman, 2019). It further concurs with Gold and Vitalis' (2023) discovery that lecturers in public universities in Enugu State, Nigeria, have trouble implementing blended teaching in Business Education due to poor supply of power and poor knowledge of pedagogical instructional tools. While consistency can also be linked with Pima and Mtui's (2017) finding that Tanzanian higher education lecturers have difficulty in adopting collaborative web technologies for teaching processes because of undependable ICT infrastructure and poor internet connection, it differs from a part of the result that the teachers' obstacles also include lack of a coordinating framework on collaborative web technologies, absence of ICT policy on the technologies and lecturers' lack of awareness of the technologies. The indifference of the Nigerian government to funding Nigerian public universities and the seeming resistance to change by the lecturers may be accountable for this finding.

## CONCLUSION

The study was meant to figure out issues revolving around lecturers' adoption of collaborative technologies in educating students about Library and Information Science in South-South Nigerian government-owned universities. The study established that the lecturers make minimal adoption of collaborative technologies for instructional activities. In spite of this, the lecturers put the technologies to such pedagogical uses as delivering lectures and supplying course contents to students. In adopting these tools for teaching task, the lecturers have been able to stay current, to easily share course content to students, to conveniently exchange information with students, and to develop digital expertise. However, barriers such as shortage of information and communication technology facilities, unstable internet connectivity, irregular power supply, poor funding and poor ICT skill hindered the lecturers from optimizing the tools for teaching processes.

## RECOMMENDATIONS

Based on the findings of the study, the researchers recommended that:

- The lecturers should undergo self-sponsored and university-sponsored training in digital literacy and in innovative teaching techniques; and
- Nigerian government should increase budgetary allocation to the universities under study.

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# APPENDIX A

## Questionnaire on Lecturers' Adoption of Collaborative Technologies in Teaching Library and Information Science in South-South Nigerian Government-Owned Universities

### Section A: Demographic Data of Respondents

*Institutional Affiliation:* The table below shows the possible South-South Nigerian government-owned universities in which you teach Library and Information Science. Please use a tick (√) to indicate your university in the table:

| Sr. No. | Name of Institution | Response |
|---|---|---|
| 1. | University of Portharcourt | |
| 2. | University of Benin | |
| 3. | University of Calabar | |
| 4. | University of Uyo | |
| 5. | Niger Delta University | |
| 6. | Cross Rivers State University of Science and Technology | |
| 7. | Ambrose Ali University | |
| 8. | Rivers State University | |
| 9. | Delta State University, Abraka | |
| 10. | University of Agbor, Delta | |

### Section B: Lecturers' Adoption of Collaborative Technologies in Teaching Library and Information Science in South-South Nigerian Government-Owned Universities

**Cluster A: Extent to which Lecturers Adopt Collaborative Technologies to Teach Library and Information Science in South-South Nigerian Government-Owned Universities**

The scale in the table below, abbreviated as VGE, GE, LE and VLE, which stand for Very Great Extent (4), Great Extent (3), Low Extent (2) and Very Low Extent (1) respectively, indicates the extent to which you might have adopted the itemized collaborative technologies to teach Library and Information Science. Kindly use a tick (√) to indicate the extent to which you have adopted each of the technologies using the scale.

| Sr. No. | Items | VGE | GE | LE | VLE |
|---|---|---|---|---|---|
| 1. | Interactive digital white board | | | | |
| 2. | Google classroom/Meet | | | | |
| 3. | LinkedIn | | | | |
| 4. | Facebook | | | | |
| 5. | Moodle | | | | |
| 6. | WhatsApp | | | | |
| 7. | Twitter | | | | |
| 8. | Telegram | | | | |
| 9. | Blogs | | | | |
| 10. | Wikis | | | | |
| 11. | Electronic mail | | | | |
| 12. | YouTube | | | | |
| 13. | Zoom | | | | |

**Cluster B: Purposes for which Lecturers' Adopt Collaborative Technologies to Teach Library and Information Science in South-South Nigerian Government-Owned Universities**

The scale of Agree (2) and Disagree (1) in the table below shows the probable purposes for which you have adopted and not adopted collaborative technologies in teaching Library and Information Science. Please use a tick (√) to indicate the areas you have adopted and not adopted these technologies using the scale.

| Sr. No. | Items | Agree | Disagree |
|---|---|---|---|
| 1. | I use collaborative technologies to develop course content. | | |
| 2. | I utilise collaborative technologies to deliver lectures to students. | | |
| 3. | I adopt collaborative technologies to distribute course content to students. | | |
| 4. | I adopt collaborative technologies to assess students. | | |

**Cluster C: Benefits Lecturers Derive from Adopting Collaborative Technologies to Teach Library and Information Science in South-South Nigerian Government-Owned Universities**

The scale in the following table, SA, A, D and SD, which symbolize Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1), depicts your agreement with the gains that accrue to you as a result of your use of collaborative technologies in teaching Library and Information Science. Kindly use a tick (√) to show your benefits using the scale.

| Sr. No. | Items | SA | A | D | SD |
|---|---|---|---|---|---|
| 1. | Collaborative technology usage for teaching enables me to have access to the latest information. | | | | |
| 2. | Collaborative technology utilization for instruction helps me to distribute course content to students easily. | | | | |
| 3. | Pedagogical collaborative technology adoption facilitates my communication with students. | | | | |
| 4. | Using collaborative technology to teach students makes me a resourceful teacher. | | | | |
| 5. | Utlising collaborative technology for teaching purpose enables me to acquire digital skills. | | | | |

**Cluster D: Barriers Faced by Lecturers in Adopting Collaborative Technologies to Teach Library and Information Science in South-South Nigerian Government-Owned Universities**

The scale in the following table, abbreviated as SA, A, D and SD which stand for Strongly Agree, Agree, Disagree and Strongly Disagree respectively, reveals the likely challenges you have encountered in adopting collaborative technologies in teaching Library and Information Science. Please use a tick (√) to indicate your challenges using the scale.

| Sr. No. | Items | SA | A | D | SD |
|---|---|---|---|---|---|
| 1. | Inadequate ICT facilities | | | | |
| 2. | Lack of supporting policy framework | | | | |
| 3. | Lack of awareness of collaborative technologies | | | | |
| 4. | Unstable internet connectivity | | | | |
| 5. | Poor funding | | | | |
| 6. | Unstable power supply | | | | |
| 7. | Poor ICT skill | | | | |

## Appendix B: Sample Distribution of Respondents of the Study

| Sr. No. | Names of Universities | Number of Respondents | Percentage of Respondents |
|---|---|---|---|
| 1. | University of Port Harcourt | 8 | 10.67% |
| 2. | University of Benin | 7 | 9.33% |
| 3. | University of Calabar | 9 | 12% |
| 4. | University of Uyo | 7 | 9.33% |
| 5. | Niger Delta University | 8 | 10.67% |
| 6. | Cross Rivers State University of Science and Technology | 9 | 12% |
| 7. | Ambrose Ali University | 9 | 12% |
| 8. | Rivers State University | 7 | 9.33% |
| 9. | Delta State University, Abraka | 6 | 8% |
| | University of Agbor, Delta State | 5 | 6.67% |
| | Total | 75 | 100% |