AVAILABILITY AND USAGE OF CLOUD COMPUTING TECHNOLOGIES FOR TEACHING AND LEARNING IN NIGERIA UNIVERSITIES.

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Abstract

This paper identified the different types of cloud computing technologies that are available for teaching and learning among universities in Southwestern Nigeria. It also examined the level of the application or usage in teaching and learning among selected universities in Southwestern Nigeria. The study employed a descriptive cross-sectional survey research design. Lecturers from Southwestern Nigeria public and private universities served as population for the study. Three hundred lecturers and 700 students were selected from the universities using stratified sampling technique. Data for the study was collected using two instruments: "Questionnaire on Acceptance and Application of Cloud Computing Technologies for Teaching" (QAACCTT) and "Questionnaire on Acceptance and Application of Cloud Computing Technologies for Learning" (QAACCTL). The data was analyzed using percentage, mean and standard deviation.The result identified cloud computing technologies for teaching and learning by these grouping; Learning Management system had Google Classroom as the most commonly used with (78.50%) for teaching and (80.06%) for learning. Cloud Storage Apps had Google Drive as the highest used with 43.00% for teaching and 38.40% for learning. The Cloud Based Video Conferencing Platform had Zoom as the most commonly used with 67.20% for the lecturers and 61.60% for the students, Google Meet followed with 43.01% and 43.00% for both lecturers and students respectively. Lastly the Social Media group had WhatsApp as the most commonly used with (65.05%) and (65.18%) for both teaching and learning activities respectively. The level of application of these technologies for teaching and learning among the selected universities was discovered using data gathered from 15 and 9 items in the lecturers' and students' questionnaires respectively. The Mean, frequency counts and standard deviation of replies for each item are available in the body of the paper. The study concluded that the awareness of the use of cloud computing technologies in teaching and learning was not popular

then in Nigerian public universities while private universities have a little knowledge of the usage.

Keyword: Availability, Cloud Computing, Technologies, Teaching, Learning.

Background to the Study

The COVID-19 pandemic caused a massive collapse in human capital at critical moments in the life cycle, derailing development for millions of children and young people in low- and middle- income countries according to the first analysis of global data on young people under the age of 25. Schools were shut down for very long periods of time. These children were kind of locked out of school literally. Several children and adults lost their loved ones leading to lack of care, loss of identity, loss of properties, food insecurity and hunger in the whole world. Human capital according to the Chief Economist for Human Development at the World Bank Schady (2023) is a fundamental driver of economic growth. So reducing the levels of human capital for countries that already were struggling with a sustained reasonable level of growth could be a big problem.

Prior to the outbreak of the COVID-19 pandemic, cloud computing technologies were in use for educational purposes in developed and some developing countries. However, in Nigerian higher institutions of learning, cloud computing was used mainly for administrative purposes and rarely used for teaching and learning except by very few academic staff on an individual basis. It was mainly used for such administrative tasks as: students' course registration, allocation of bed spaces, payment of school fees, mobilization for the National Youth Service Corps (NYSC) and so on. The COVID-19 pandemic made it necessary for government and educational institutions to come up with a pronouncement backing the use of cloud computing technologies in teaching and learning from tertiary institutions to primary level. This became necessary in order to abide by the ethics of social distancing and reduce the spread of the disease. Hence, the outbreak acted as a catalyst for the adoption of cloud computing technologies as an alternative to physical teaching and learning in Nigerian higher institutions during the pandemic.

Objectives of the Study

The objectives are to:

1. identify the different types of cloud computing technologies that are available in teaching and learning among universities in Nigeria;

2. examine the level of application of cloud computing technologies in teaching by lecturers and learning by students among universities in Nigeria;

Research Questions

1. What are the different types of cloud computing technologies available for teaching and learning among universities in Nigeria?
2. What is the level of application of cloud computing technologies for teaching and learning among universities in Nigeria?

Literature Review

Information technology (IT) has created a lot of educational opportunities worldwide with the use of internet facilities. It has provided robust teaching and learning environment for both teachers and learners with the advantage of making the world a global village (Aminur, Faisal, Shakib, Tarek & Farruk, 2017). This is because of its potentiality of being scalable, economical and the unlimited space that it has for data accommodation. The global meltdown of this century has added to Nigeria problems especially at her higher institutions where the resources are meagre. This has eventually led to higher institutions, workers and students struggling to maintain the status quo of education in terms of quality at all levels. Thus, there is no adequate teaching and learning in the education sector due to variables like overcrowding, teachers 'dominance, adequate learning resources are not available, the learning materials are outdated, textbooks and other infrastructure are becoming more expensive where required. There is therefore limited learning experience for the students that need to practice their field. Adeyanju, (1998) opined that acceptability of any technology is a major problem for teachers because they do not want a change in the way they do thing. Teachers are slow to adopting technology because of the fear of it taking their roles as sole owners of knowledge, their pride and their jobs. The traditional chalk and board method of teaching and learning in the secondary school from experience is still in vague when has learners are already in the use of the various technology platforms: like the smart phones, android phones and the use of the search engines. These activities as observed have negative effect on the planned learning activities in the classroom because the students are usually attracted to the devices, this leading to their becoming inattentive because of diversion of interests, and lack of interest in the use of traditional approach to learning. There is observed apathy to being under the strict control of the teacher in a harsh environment, because learners have the knowledge of searching for more information online. There is also on the increase the problem of the teacher self-efficacy which is not supposed

to be so. It is felt that the problems of learning efficiency in southwestern Nigerian universities are compounded.

The enrollment of students into full time, part time, and distance learning programme is increasing rapidly. This is due to the fact that globally, both old and young are seeking formal and informal education. In a developing country like Nigeria, the number of people seeking admission on a ye arly basis into tertiary institutions are usually several thousands more than the carrying capacities of higher educational institutions. This calls for a more drastic and effective method of catering for the needs of everybody, and improving on teaching and learning to fulfil the need to create simpler and more productive strategies for getting things done. For instance, the traditional method of teaching and learning is "teacher centered" and it is more stressful for both learners and teachers. Cottel and Millis (1993) stated that the teachers create learning materials and students' evaluations in this method of teaching, which are then communicated to the students via the lecture technique.

Huba & Freed (2000); Gauci, Dantas, Williams & Kernm (2009); Haak, Hilleris, Lamberts, Pitre and Freeman (2011); believe that typical teaching methods are caricatured and passive, and that this experience is robbing students of their competency and their capacity to learn at their own speed. The traditional method of teaching such as lecture method, memorization and recitation has been on for several years in the universities. In traditional method of teaching and learning according to King (1993), one would have an instructor or "the sage on the stage", disseminating knowledge to receiving practically inactive students. This has been condemned thoroughly as not suitable for teaching higher order skills such as application and analysis that are needed for learning at all levels.

Nweze (2005) viewed stress as a natural phenomenon which most times hampers strength and zeal. Pouring of large volumes of information to the student amounts to cognitive overload in the traditional classroom and it can be stressful to both the lecturers and the students. This stress eventually affects students' learning in terms of the dwindling academic performance that accounts for high rate of attrition among students (Huang, 2005). As a result, it has become critical to take deliberate measures to decrease students' academic stress. If greater performance is to be attained, the ability to study or learn at home or at work must be made available.

Yusuf (2005) asserted that information and communication technologies (ICT) could speed learning and improve learning quality. It also has the potential to excite and engage students to help them connect their school experiences to work practices, enhance teaching, and assist schools in changing. Information and communication technologies (ICT) are electronic tools used for data storage and recovery, (Damkor,

Irinyang, & Haruna, 2015). The ability to create a synergistic partnership between technical innovation and human traits is viewed as controlling some improvement aspects. ICTs have undoubtedly had an impact on teaching, learning, and research in the field of education. Students have access to tools that adjust to their attention span and provide substantial and quick input to proficiency improvement in schools where new technologies are used, which is currently not fully implemented in the Nigerian educational system.

METHODOLOGY

The study adopted the descriptive cross-sectional survey research design. The population of the study consisted all the lecturers and students in all the universities in the six states of Southwestern Nigeria which include federal, state and privately owned universities.

Seven hundred students and 300 lecturers were selected using multistage sampling procedure. Three states were randomly selected from the six states that made up the Southwestern region of Nigeria. Purposive sampling technique was then used to select one Federal, State and Private university each from the selected states based on their online visibilities (2020 university webometric ranking). Proportionate sampling technique was then employed in selecting 140 lecturers from the 3 selected federal universities, 90 lecturers from the 3 states universities and 70 lecturers from the 3 private universities. The same technique was employed in selecting 400 students from the 3 selected federal universities, 200 students from the 3 state universities and 100 students from the 3 private universities. Convenient sampling technique was employed in administering copies of the questionnaire on the respondents.

Questionnaires on the Adoption and Acceptance of Cloud Computing Technologies for Teaching (QAACCTT) and Questionnaire on the Adoption and Acceptance of Cloud Computing Technologies for Learning (QAACCTL) were used to gather data for this study. The questionnaires were adapted from Elnajar, Sahley, Farkash & Faraj (2019) and Tan (2013) in Oteyola, Oyeniran Awopetu & Bello (2021). The instruments were likert type scale with four options of strongly agree, agree, disagree and strongly disagree. There were five sub-sections in both QAACCTT and QAACCTL. Section A required demographic information, Section B gathered information on the cloud computing technologies used for teaching or learning in the universities under seven subsections: Learning Management Systems (LMS); Simulation, Massive Open Online Courses (MOOC), Team, Cloud Storage Apps (CSA), Cloud Based Video Conference platform (CBVC) and Social media with 28

items. Section C with 15 items for the lecturers and 11 items for the students elicited information on the application of cloud computing technologies for teaching or learning at the universities.

RESULTS

Research Question 1(a): What are the different types of cloud computing technologies that are available for teaching among universities in southwestern Nigeria?

This question was raised to identify the cloud computing technologies that are available for teaching at the universities in Southwestern Nigeria. Section B of the QAACCTT was used in eliciting this information under three subheadings. The identified cloud computing technologies that are available for teaching by the lecturers in the selected Universities are Google Classroom, Moodle, Blackboard, Edmodo, Microsoft Office 365, Google Docs, Google Drive, WhatsApp, Zoom, Google Meet, Microsoft PowerPoint for the Web, Telegram, Skype, Instagram and others.

TABLE 1: Cloud Computing Technologies that are Available for Teaching among Universities in Southwestern Nigeria as Identified.

Learning Management System	**%**	**Cloud Storage Apps**	**%**	**Cloud Based Video Conference**	**%**	**Social Media Platform**	**%**
Google Classroom	80.06	Google drive	43.01	Zoom	63.20	WhatsApp	65.05
Moodle	36.56	Microsoft one drive	30.12	Google Meet	43.01	Telegram	34.95
Blackboard	30.61	Dropbox	27.42	Skype	30.11	Instagram	26.34
Microsoft Education	30.12						

Table 1 shows the four different groups of cloud computing technologies for teaching. These are Learning Management system which comprise Google Classroom with 80.06%, Moodle 36.56%, Blackboard 30.61% and Microsoft Education with 30.12%. The Cloud Storage Apps comprise of Google Drive with 43.01%, Microsoft one drive with 30.12% and Drop box with 27.42%. The third group is the Cloud Based Video Conferencing platform which has Zoom with 67.20%, Google Meet with 43.01% and Skype with 30.11%. The last one is the Social Media platform with

WhatsApp having 65.05%, followed by Telegram with 34.95% and Instagram with 26.34%. This showed that the awareness of the use of cloud computing technologies was low in Nigerian universities prior to COVID-19 pandemic among the lecturers.

Research Question 1(b): What are the different types of cloud computing technologies that are available for learning among universities in southwestern Nigeria?

TABLE 2: **Cloud Computing Technologies that are Available for Learning as Identified among Universities in Southwestern Nigeria.**

Learning Management System	**%**	**Cloud Storage Apps**	**%**	**Cloud Based Video Conference**	**%**	**Social Media**	**%**
Google Classroom	80.06	Google Drive	38.40	Zoom	61.20	WhatsApp	65.10
Blackboard	33.03	Google Does	26.90	Google Meet	43.00	Telegram	34.90
				Skype	26.30	Instagram	30.10

This table reflects the four groups of cloud computing technologies for learning. Learning management system have Google Classroom with 80.06% and Blackboard with 33.03%. The Cloud Storage Apps have only Google Drive with 38.40% as learning tool, while the Cloud Based Video Conferencing platforms have Zoom with 61.16%, Google Meet 43.00% and Skype 26.34%. The last in the group is the Social Media Platforms which have WhatsApp with 65.18%, follow by Telegram with 34.97% and Instagram with 30.10% as learning technologies.

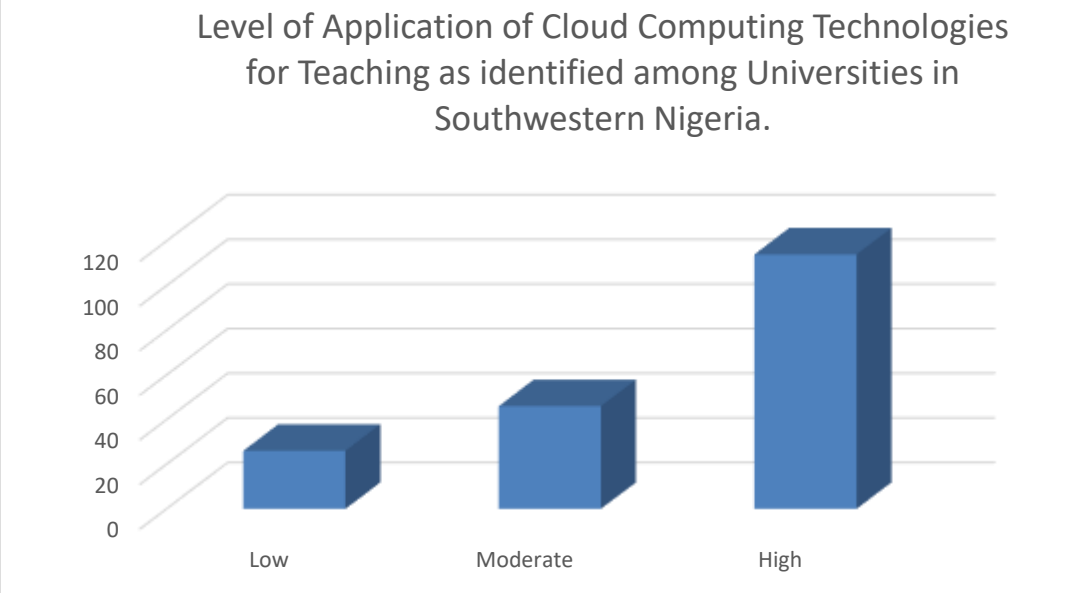

Figure 2.1
Source: Field Survey, 2021.

The QAACCTT section C gathered data on the use of cloud computing technologies in the classroom. This data was gathered from 15 different sources. The mean and standard deviation of replies for each item are shown in the table below (Appendix V). Strongly agree received a score of 4, agree received a score of 3, disagree received a score of 2, and strongly disagree received a score of I. The maximum score obtainable in each of the items was 4. Therefore, the maximum score obtainable on application of cloud computing for teaching was 60. The mean image of each of the items was determined by (1 + 2 + 3 + 4)/4 = 10 / 4 = 2.5 (approximately 3). The overall mean is therefore = 60 / 3 = 20. Scores between 0 and 20 were categorized as Low; scores between 21 and 40 were categorized Average and scores between 41 and 60 were categorized High.

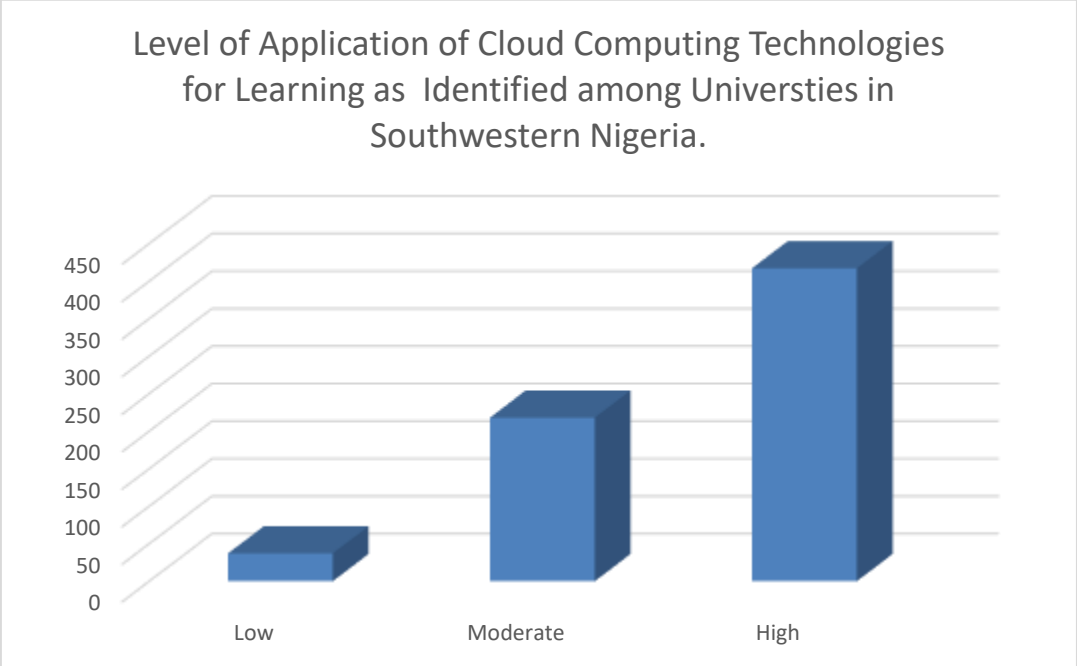

Figure 2.2
Source: Field Survey, 2021

The above chart explained the level of application of cloud computing technology for learning. Section C of QAACCTL gathered information on the application of cloud computing technologies for learning. There are 9 items that elicited this information. Appendix VI shows the mean and standard deviation of replies to each of the items. Strongly agree received a score of 4, agree received a score of 3, disagree received a score of 2, and strongly disagree received a score of 1. The maximum score obtainable in each of the items was 4. Therefore, the maximum score obtainable on application of cloud computing for learning was 36. The mean of each of the items was determined by (1 + 2 + 3 + 4)/4 = 10 / 4 = 2.5 (approximately 3). The overall

mean is therefore = 36 / 3 = 12. Scores between 0 and 12 were categorized as Low; scores between 13 and 24 were categorized Average and scores between 25 and 36 were categorized High.

Conclusion

Based on the study's findings, the following conclusions were drawn. The awareness of the use of Cloud Computing Technologies for teaching and learning among the lecturers and students of Nigerian universities to enhance teaching and learning is advancing at a very slow rate. This is because the usage of some of the known applications according to the research findings was not that high as expected from the higher education sector as universities which are expected to set pace for other higher educational institutions being the peak of the nation's development.

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