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Digital literacy of library and information science postgraduates and ubiquitous learning in state owned universities, south-south, Nigeria

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Keywords: Digital Literacy, Ubiquitous learning, mobile computing, cloud computing, Multimedia, social media

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Abstract: The study investigated digital literacy of library and information science postgraduate students and ubiquitous learning in state universities in south-South, Nigeria. Four (4) objectives, four research questions, and four hypotheses guided the study. The hypotheses were tested at 0.05 level of significance. The study adopted a correlational design and the population was 221 comprising library and information science postgraduate students from eight (8) state universities in South-South, Nigeria. The census sampling technique was used to select the entire population of 221 which represents the sample size. Instrument titled "Digital Literacy of Library and Information Science Postgraduate Students and Ubiquitous Learning Questionnaire" (DLLISPSULQ) was used for data collection. The reliability of the instrument was established through test-retest methods and was determined using Cronbach Alpha method which yielded reliability coefficient of 0.89. The study was analyzed using mean and standard deviation for research questions and Pearson Product Moment Correlation for hypotheses. It was revealed that there was a significant relationship between digital literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria. It was recommended that Library and Information Science schools in South-South, Nigeria should as a matter of policy direct all LIS educators to adopt the use of ubiquitous technologies in teaching to enhance the adoption of ubiquitous learning by Postgraduate students.

Introduction

The burgeon of innovative technologies, proliferation of computing devices, digitization of information resources, and the use of telecommunications wireless internet have transformed the mode of teaching and learning. Education has, therefore, undergone major changes in recent years with the development of digital information transfer, storage, and communication methods which recorded a significant effect. This development has allowed for access to global communications and the number of resources available to today's students as the traditional method is no longer very suitable in the current information society characterized by the utilization of digital technologies which allow students the opportunity to learn from anywhere, at any time, and any place (Ahiauzu et al., 2020).

Chng and Samsudin (2013) had noted that after the initial impact of computers and their applications in education, the introduction of electronic learning and mobile learning epitomized the constant transformations that were occurring in education. The assimilation of ubiquitous computing in education hence marks another great step forward, with Ubiquitous Learning (u-learning) emerging through the concept of ubiquitous computing, which is both pervasive and consistent, enabling students to access educational resources easily, flexibly, calmly, and seamlessly. They are widely used to enhance learning especially in digital environment and from any distance; thus, there is the need for digital literacy.

Digital literacy according to Western Sydney University (2020) is possessing the skills required to live, learn, and work in an environment where communication

of information and access to information is mainly through digital technologies like internet platforms, social media, and mobile devices. It is a skill that is required to learn and work in an environment that is characterized by digital technologies such as social media, gadgets, internet platforms, learning management systems, computing technologies, cloud technologies, and self-learning tools like YouTube. Digital literacy of students can be enhanced if teachers will apply digital media in teaching and learning. This will spur students to use digital media which will in turn enhance their digital literacy and motivate them to partake in ubiquitous learning environment.

According to Zhang (2015), ubiquitous learning can be viewed as the integration of mobile learning and electronic learning, allowing for personalization and customization to student's real needs. Chng and Samsudin (2013) noted that ubiquitous learning is usually confused with mobile learning but the latter is dependent on the use of mobile technologies to facilitate learning while ubiquitous learning emphasizes on the learning context where learning can happen anywhere and anytime with the ubiquitous tools. Bdiwi and Bargaoui (2015) believed that ubiquitous learning tools helps in establishing effortless interaction between authentic and digital learning resources and at the same time offering personalized learning opportunities. Ubiquitous learning tools could be multi-media, mobile computing, social media, cloud technology, Learning Management System (LMS), and cloud computing.

Ubiquitous learning, characterized by its anytime-anywhere access to educational resources facilitated through technology, is progressively being adopted in Nigeria. The rise in mobile phone usage and internet penetration has significantly contributed to this trend. Reporting from Statista, Sasu (2024) confirmed that as of 2022, Nigeria had nearly 84 million internet users. This figure is projected to grow to 117 million internet users in 2027, marking a substantial increase from previous years. This growth provides a foundation for the expansion of ubiquitous learning, enabling students to access educational materials via smartphones, tablets, and laptops. Various educational institutions have begun to leverage online platforms to supplement traditional learning methods, recognizing the potential to enhance educational outcomes through digital means. Despite the positive trends, the implementation of ubiquitous learning in Nigeria faces several critical challenges. Infrastructural deficiencies, such as unreliable electricity supply and insufficient internet coverage, particularly in rural areas, hinder the effective adoption of digital learning platforms. Reporting World Bank statistics, Ugwoke et al. (2020) noted that only 41% of rural dwellers have access to electricity as compared to 86% of the urban population in Nigeria. Moreover, high data costs remain a barrier for many students, limiting their ability to engage consistently with online educational content. The disparity in technological access exacerbates educational inequalities, making it difficult for students in underserved regions to benefit from ubiquitous learning.

In response to these challenges, various initiatives are being undertaken to improve the digital learning in Nigeria. The Nigerian government, along with private sector stakeholders, is investing in digital infrastructure to bridge the gap between

urban and rural areas. Programs aimed at enhancing digital literacy and providing affordable internet access are being implemented to ensure a more inclusive educational environment. For instance, the National Open University of Nigeria (NOUN) has expanded its online course offerings and support services to reach a broader audience (NOUN, 2024). Additionally, the COVID-19 pandemic has underscored the necessity for resilient educational systems, prompting further investment in technology-driven learning solutions. While progress is ongoing, a collaborative effort from all sectors is essential to fully realize the potential of ubiquitous learning in Nigeria. Notwithstanding, digital literacy is key component in the adoption of ubiquitous learning. This is because according to Robinsonet al. (2020) discontentment and unequal digital skills will exclude people from exploiting digital tools such as ubiquitous learning opportunities. Regrettably, Parlakkılıc (2020) observed that research on u-learning is ongoing, especially the ubiquitous learning system theory and application methods are being investigated. Furthermore, there is insufficient attention given to digital literacy and ubiquitous learning. Thus, the need for this study.

Statement of the Problem

The development and proliferation of digital tools have influenced every sphere of human endeavour including the method of teaching and learning. Consequently, universities are leveraging various learning tools to facilitate teaching and learning. These include the use of instructional materials, multimedia, and the adoption of online learning platforms such as distance learning, mobile learning, e-learning, and now ubiquitous learning. Interestingly, the state of ubiquitous learning in Nigeria is gradually improving, driven by increasing mobile phone usage and internet penetration. However, significant challenges such as unreliable electricity, high data costs, and limited internet coverage, particularly in rural areas, hinder widespread adoption. Digital literacy is crucial in this context, as it empowers students and educators to effectively use technology for learning. Enhancing digital literacy is essential to maximize the benefits of ubiquitous learning, ensuring that all students, regardless of their location, can access and utilize digital educational resources effectively. Initiatives aimed at improving digital skills and providing affordable internet access are pivotal in bridging the educational divide and fostering a more inclusive learning environment in Nigeria. This is because digital literacy is a formidable skill in the digital world of which when lacked, limits one from harnessing ubiquitous learning opportunities but from preliminary observation by the researcher, it seems that postgraduate students are reluctant in the adoption of ubiquitous learning as they apparently rely on physical classroom lecturers for study. Could this be attributed to lack of digital literacy? There is, therefore, a need to investigate the digital literacy of LIS Postgraduate students and ubiquitous learning.

Objectives of the Study

The aim of the study is to determine the relationship between digital literacy of library and information science postgraduate students and ubiquitous learning in state universities in South-South, Nigeria. Specifically, the study seeks to:

1. Investigate the relationship between mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria
2. determine the relationship between cloud computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria
3. unravel the relationship between social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria
4. discover the relationship between multi-media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

Research Questions

1. What is the relationship between mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria?
2. What is the relationship between cloud computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria?
3. What is the relationship between social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria?
4. What is the relationship between multi-media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria?

Hypotheses

The hypotheses are stated in null form and will be tested at 0.05 level of significance

Ho_1 There is no significant relationship between mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

Ho_2 There is no significant relationship between cloud computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

Ho_3 There is no significant relationship between social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

Ho_4 There is no significant relationship between multi-media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

Literature Review

Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was first created by Davis in 1989 (Daniels et al. 2023). TAM proposed that perceived ease of use and perceived usefulness of technology are predictors of user attitude toward using the technology, subsequent behavioural intentions, and actual usage. Perceived ease of use was also considered to influence perceived usefulness of technology. Perceived usefulness refers to the degree to which the user believes that using the technology improves user's work performance. On the other hand, perceived ease of use refers to how effortless the user perceives using the technology could be. Both are considered distinct factors influencing the user's attitude toward using the technology. According to Chigozie-Okwum et al. (2018), technological innovation has been the pillar of success in many organizations in the knowledge age, irrespective of the organization type. The user attitude toward a system is a determining factor in whether they will use the system or not.

In the case of ubiquitous learning, in order for the students to adopt ubiquitous learning tools and use them effectively, the students ought to have a positive attitude toward the tools, perceive them as useful, and be willing to try them. This could require a big perceptual adjustment, depending on the students' current perception of usefulness of the ubiquitous learning.

Different authors have applied TAM in various technological studies to ascertain its relevance in the adoption of technology. For example, Mady and Baadel (2020) investigated YouTube as a learning aid and hinged the study on a TAM model and discovered from the result of hypotheses that there is a positive relationship between the perceived usefulness and the student's adoption of YouTube as a learning tool and there is a positive relationship between the ease of use and the students' adoption of YouTube as a learning tool. Similarly, Al-Hamad et al. (2020) used TAM to study the use of smart devices in teaching and learning as well as their reality and challenges in Jordan universities and discovered that perceived ease of use was also hypothesized to influence perceived usefulness and attitude toward using the technology. Such attitude toward using the technology determined the behavioural intention to use that technology. Mohammadi et al. (2020) also investigated mobile phone use in education and learning by faculty members of technical-engineering groups: and revealed that the levels of "Ease of Use" and "Self-ef-

ficacy" are above average. Mobile use also presents some challenges and barriers that also rise above adequate and acceptable levels. However, usefulness remains at an average level.

Based on the assertions and findings by various authors, it is clear that Technology Acceptance Model is a determinant of the adoption of technology. The TAM model is, therefore, relevant to this study which sought to investigate digital literacy of library and information science students and ubiquitous learning. This is because looking at the indices of the TAM model, perceived ease of use and perceived usefulness, it can be hypothesized that if library and information science students perceived that ubiquitous learning tools will enhance their learning experiences with ease and effortless, it will influence their adoption of ubiquitous leaning. Digital literacy of library and information science students which the study sought to ascertain could be a militating factor against the adoption of ubiquitous learning, its perceived usefulness could motivate the students to acquire the skills. This should enable them to exploit the usefulness which of course with its ease of use, thus, will encourage the adoption of ubiquitous learning among library and information science students. The TAM model is, therefore, suitable for this study.

Digital Literacy

Digital literacy according to Okwu et al. (2022) is the ability to locate, analyze, exploit, and generate information using digital tool, communication tools, or networks. Furthermore, it is the capacity to leverage information in a variety of formats from a variety of digital sources. Digital literacy involves the mastery of ideas, and is not just about using the technology itself. Bravoet al. (2021) noted some digital literacy to include media literacy, information literacy, digital scholarship, communications and collaboration, and ICT literacy. Audrinand Audrin (2022) identified technical, cognitive, and social-emotional as dimensions of digital literacy. Omehia et al. (2021) emphasized that individuals need to be able to locate, navigate, retrieve, and utilize information from various sources. Similarly, Silamut and Petsangsri (2020) noted that one not only needs to be able to search and manage but also to scrutinize and integrate digital information. Lestariet al. (2020) recognized that digital literacy has become formidable skills in the digital age. This could enable people to easily navigate on the web, search for articles and videos, and share information with friends.

Ubiquitous Learning (U-Learning)

The concept of Ubiquitous Learning has generated a lot of misconceptions due to other related concepts like the e-learning and the mobile-learning. Although they seem to imply the same thing, they are not. They can, however, be said to have the same goal which is to enhance teaching and learning due to their similarities in dealing with the issues of space and time in learning. In trying to explain the dif-

ferent meanings of the terms e-learning, mobile learning and Ubiquitous Learning, Parlakkılıç (2020) noted that most of the e-learning systems work on a client-server architecture structure or on a central server logic where the learner is dependent on the system and the teacher and often uses the specific resources provided to him or her.

E-learning can be described as the distribution and use of information in the network environment in education and training. The system in this structure is sometimes called distributed learning, online learning, virtual learning, and web-based learning. E-learning covers all of these and is conducted online, offline, synchronously and asynchronously with networked wired devices and systems (Naidoo, 2006). As an extension of e-learning, m-learning is used today, but m-learning is considered a new level of development as a subset of e-learning. M-learning is a wireless and internet-based e-learning system and requires a permanent commitment to the physically existing network such as Mobile Telephone Network (MTN), Globacom, and Airtel. The advantages of m-learning over e-learning are elasticity, cost, ease of use, and use in time-dependent applications. The devices used in the m-learning system are Personal Development Assistance (PDA), mobile phones, laptop, notebook, and tablet computer devices.

Mobile Computing Literacy and Ubiquitous Learning

According to Omehia and Nsirim (2022),mobile computing is commonly defined as the technology used in cellular communications that is portable, powered by battery and uses wireless connectivity which encompasses all computing devices that allow internet connection and communication at any time. They include cell phones, tablet computers, and laptops. Mobile computing is a human-computer interface through which multimedia resources such as data, text, image, voice, and video can be communicated and or transmitted using computers or wireless devices. The mobile hardware packages include laptops, smartphones, tablet, Personal Digital Assistants, and mobile software packages include Simbian, windows mobile, and application software such as mobile social media like Facebook, WhatsApp, and Twitter (Igwela & Nsirim, 2018). They facilitate communication between educators and students. Students can use their smart devices to download course materials through Learning Management Systems (LMS), submit assignments and projects get announcements, interact with lecturers, and undertake other educational activities. Some teachers encourage students to use smart devices outside classrooms, yet some are very reluctant to their use inside the classroom and during lectures. Alshammari (2020) studie dthe current use of mobile devices among students and faculty in teaching in a Saudi Arabian Context**.** The results showed that students predominantly used their mobile devices informally outside the classroom to facilitate their English language learning.

Cloud Computing Literacy and Ubiquitous Learning

The National Institute of Standards and Technology (as cited in Kuliya et al., 2015) defined cloud computing as a means for enabling convenient and on-demand network access to a distributed pool of configurable computing resources such as networks, servers, storage, applications, as well as services that can be speedily provisioned and allows for minimal management effort and service provider interaction. Cloud computing can be leveraged for various educational purposes, such as recording lectures for students to access at their convenience, uploading documents and resource links, providing access to ubiquitous learning materials like e-lecture notes, e-books, and e-journals, posting grades, creating online chat rooms, and discussion boards for student interaction, such as with Google Hangouts. Omehia and Nsirim (2022) investigated computing technologies and paperless classroom in library schools in Rivers State. The study revealed that most of the respondents could use some cloud computing applications such as email but lacked the skills to use GoogleDocs. However, the study also revealed that there was a significant relationship between cloud computing and paperless classroom in library schools in Rivers State. The study recommended that the library schools management should as a matter of policy implement the use of cloud computing in library schools in Rivers State.

Social Media Literacy and Ubiquitous Learning

Social media comprises a collection of internet-based interactive platforms that are built upon the principles and technology of Web 2.0, allowing users to generate and exchange content. According to Chen et al. (2012), social media has found utility in higher education, enabling students to share learning materials, engage in peer review, and maintain personal blogs reflecting on their learning experiences. Its advent has had a profound impact on students, affecting both their academic and social lives as they connect for various purposes. Chughet al. (2021) claim that social media facilitates interaction by bringing together instructors, students, and other academic stakeholders to foster knowledge construction in teaching and learning. Tayo et al. (2019) examined social media usage among undergraduates and its influence on their studies in Obafemi Awolowo University, Ile-Ife, Nigeria. The results show social media platforms used by undergraduates include WhatsApp, Facebook, Instagram, YouTube, Twitter, LinkedIn, Google Plus, Snapchat, and Skype. Undergraduates perceived purposes of social media usage included academic.

Multimedia literacy and Ubiquitous Learning

Multimedia refers to computer-based systems that employ associative connections to enable learners to explore and retrieve information containing text, audio, visuals, video, animations, and other media. According to Abdulrahamanet al.

(2020), multimedia employs various types of media and communication technologies to enhance content visualization and user interaction. Udim and Etim (2016) examined the use of multimedia in teaching and learning of political science in University of Uyo, Akwa Ibom State, Nigeria. The study revealed that due to lack of digital literacy and lack of understanding of the benefits of multimedia facilities, there was minimal use of multimedia in teaching and learning of political science. The study recommended that the Federal Government of Nigerian should see multimedia integration effort at the university as an embracing project to development in education and should support by allocating and releasing adequate funds to invest in massive Internet connectivity.

Methodology

The study adopted correlational research design. Two Hundred and Twenty-One (221) library and information science postgraduate students were the population of the study. It comprised all postgraduate students in library schools in state universities in South-South, Nigeria. The library schools in the state universities are Department of Library and Information Science, Akwai-Ibom State University, Mkpat-Enin; Department of Library and Information Science, Ambrose Ali University, Ekpoma, Edo State, Department of Library and Information Science, Cross Rivers State University, Calabar; Department of Library and Information Science, Delta State University Abraka, Department of Library and Information Science, Ignatius Ajuru University of Education, Port Harcourt,; Department of Library and Information Science, Niger Delta University, Bayelsa State; and Department of Library and Information Science, Rivers State University, Port Harcourt, Rivers State. However, of all the library schools in the state universities, only four library schools in three state universities in the South-South Geopolitical Zone are offering post graduate programs in library and information science. Therefore, the target population of the study are 221 postgraduate students in the four (4) state library schools in four state universities in South-South. They are Department of Library and Information Science, Ambrose Ali University, Ekpoma, Edo State (11), Department of Library and Information Science, Delta State University Abraka (98), Department of Library and Information Science, Ignatius Ajuru University of Education, Port Harcourt (99) and Department of Library and Information Science, Rivers State University, Port Harcourt, Rivers State (13).

Two Hundred and Twenty-One (221) library and information science postgraduate students were the sample size of the study. This was drawn from the target population of the four library schools with postgraduate programs in four state universities in South-South geo political zone, Nigeria. Census sampling technique was, therefore, used since the population was not large.

Questionnaire was used to gather data from the respondents. The researcher developed a questionnaire titled “Digital Literacy of Library and Information Science

Postgraduate Students and Ubiquitous Learning Questionnaire (DLLISPSULQ)". It comprises two (2) sections. Sections A and B. Section A contained information on the independent variables and Section B focused on the dependent variable. Each of the items was assigned a 4-point rating scale of Strongly Agree (SA) – 4 points; Agree (A) – 3 points; Disagree (2) – points; and Strongly Disagree (SD) – 1point. Test-retest method was adopted. To determine the reliability of the instrument, 20 copies of the questionnaire were administered to the postgraduate students in the Department of Library and Information Science, Imo State University who were not part of the study. The Cronbach Alpha Method was used to establish the consistency reliability coefficient which yield a coefficient of 0.89. This indicates the instrument is reliable.

The researcher with the help of research assistants in each of the institutions studied, administered the questionnaire. The research assistants were briefed by the researcher on the administration of the questionnaire. This approach ensured proper administration and completion of the questionnaire. Out of 221 copies of the instrument administered to the respondents, 214 were found valid and used for the analysis. Data were analyzed using Mean Scores and Standard Deviation in answering the research questions. The Pearson Product Moment Correlation (PPMC) was used to test the null hypotheses at 0.05 level of significance. This was computed using the Statistical Package for Social Science (SPSS) software version 23. The decision to accept or reject was based on the mean rating of 2.50, this implied that any item with a mean of 2.50 and above was accepted while any item with a mean below 2.50 was rejected.

RESULTS

Research Question 1: What is the relationship between Mobile Computing Literacy of LIS Postgraduate Students and Ubiquitous Learning?

Table 1. Mobile Computing Literacy of LIS Postgraduate Students

S/N	Item	SA	A	D	SD	$\bar{x}$	±	Decision
1	Download documents and files using laptop	91	123	0	0	3.4	3.4	Agree
2	Engage in online classroom using smart phones	88	126	0	0	3.4	3.4	Agree
3	Use mobile phones to access the internet	100	114	0	0	3.5	3.5	Agree
4	Share information using mobile devices	102	112	0	0	3.5	3.5	Agree
5	Collaborate with educators using mobile devices	69	111	23	11	3.1	3.3	Agree
	Weighted Mean	3.38>2.5					3.4	**Agree**

The result from Table 1 shows the mobile computing literacy of LIS postgraduate students. It revealed that item 3 has a mean score of 3.5 and standard deviation of 3.5. This indicates that LIS postgraduate students possessed the skills to use mobile phones to access the internet. Item 4 has a mean score of 3.5 and standard deviation of 3.5. This indicates that LIS postgraduate students possessed the skills to share information using mobile devices. Item 1 has mean score of 3.4 and standard deviation of 3.4. This indicates that LIS postgraduate students could download files, documents using laptop. Item 2 has mean score of 3.4 and standard deviation of 3.4. This indicates that LIS postgraduate students possessed the literacy skill to engage in online classroom using smart phones. Item 5 has mean score of 3.1 and standard deviation of 3.3. This indicates that LIS postgraduate students could collaborate with educators using mobile devices. The weighted mean of 3.3 which is greater than the criterion mean of 2.5 indicates that LIS postgraduate students in state universities in South-South, Nigeria, possessed mobile computing literacy to exploit ubiquitous learning.

Research Question 2: What is the relationship between Cloud Computing Literacy and Ubiquitous Learning of LIS Postgraduate Students?

Table 2. Cloud Computing Literacy of LIS Postgraduate Students

S/N	Item: cloud computing literacy helps me to:	SA	A	D	SD	$\bar{x}$	±	Decision
1	Share files and document through emails	101	113	0	0	3.5	3.5	Agree
2	Use of GoogleDocs to collaborate with lecturers	21	46	86	61	2.1	2.8	Disagree
3	Save documents and files on One Drive	34	64	74	42	2.4	3.0	Disagree
4	Subscribe to YouTube and access online lectures	24	91	75	24	2.5	2.9	Agree
5	Make use of online databases	30	100	64	20	2.7	3.0	Agree
	Weighted Mean					2.64>2.5	3.0.	**Agree**

Table 2 shows the cloud computing literacy of LIS Postgraduate students in state universities in South-South, Nigeria. The study reveals that item 1 has a mean score of 3.5 and standard deviation of 3.5. This implies that LIS postgraduate students could share files and document through emails. Item 5 has the mean score of 2.7 and standard deviation of 3.0. This implies that LIS postgraduate students could make use of online databases. Item 4 has mean score of 2.5 and standard deviation of 2.9. This implies that LIS postgraduate students could subscribe to YouTube and access online lecture. On the other hand, Item 3 has a mean score of 2.4 and standard deviation of 3.0. This implies that most of the LIS postgraduate students

lack the literacy skills to save documents and files on One Drive. Item 2 has mean score of 2.1 and standard deviation of 2.9. This implies that most of the LIS postgraduate students lack the literacy to use GoogleDocs to collaborate with lecturers and fellow students. However, the weighted mean of 2.6 which is greater than the criterion mean of 2.5 implies that LIS postgraduate students in State universities in South-South, Nigeria, possessed the cloud computing literacy to adopt ubiquitous learning.

Research Question 3: What is the relationship between Social Media Literacy and Ubiquitous Learning of LIS Postgraduate Students?

Table 3: Social Media Literacy of LIS Postgraduate Students

S/N	Item: Social media literacy helps me to:	SA	A	D	SD	$\bar{x}$	±	Decision
1.	Take lectures through Facebook	120	92	2	0	3.6	3.6	Agree
2.	Use Skype	22	92	78	22	2.5	2.9	Agree
3.	Subscribe to YouTube channels	66	123	15	10	3.1	2.9	Agree
4.	Chat using WhatsApp	121	93	0	0	3.6	3.6	Agree
5.	Link to learning websites via social media	21	91	79	23	2.5	2.9	Agree
Weighted Mean						**3.0 >2.5**	3.1	Agree

Table 3 shows the social media literacy of LIS postgraduate students in state universities in South-South, Nigeria. It reveals that item 4 has mean score of 3.6 and standard deviation of 3.6. This implies that postgraduate students possessed the literacy to chat using WhatsApp. Item 1 has mean score of 3.6 and standard deviation of 3.6. This implies that postgraduate students possessed the literacy to take lectures through Facebook. Item 3 has mean score of 3.1 and standard deviation of 2.9. This implies that LIS postgraduate students possessed the literacy to subscribe to YouTube channels. Item 2 has mean score of 2.5 and standard deviation of 2.9. This indicates that LIS postgraduate students could use Skype. Item 5 has mean score of 2.5 and standard deviation of 2.9. This implies that LIS postgraduate students could link to learning websites via social media. The weighted mean of 3.0 revealed that LIS postgraduate students possessed the social media literacy to leverage ubiquitous learning opportunities.

Research Question 4: What is the relationship between Multimedia Literacy and Ubiquitous Learning of LIS Postgraduate Students?

Table 4. Multimedia Literacy of LIS Postgraduate Students

S/N	Item: Multimedia literacy enables me to:	SA	A	D	SD	$\bar{x}$	±	Decision
1.	Combine text, audio, and video in knowledge sharing	27	83	86	18	2.6	2.9	Agree
2.	Get better understanding of using a combination of text, audio & video	25	80	89	20	2.5	2.9	Agree
3.	Use graphics in communication	22	55	80	57	2.2	2.9	Disagree
4.	Understand messages passed using animation	67	122	15	10	3.1	2.9	Agree
5.	Understand the use of symbols in knowledge transfer	24	82	84	24	2.5	2.9	Agree
Weighted Mean						**2.5>2.5**		**Agree**

Table 4 shows the multimedia literacy of LIS postgraduate students. It reveals that item 3 has mean score of 3.1 and standard deviation of 2.9. This indicates that postgraduate students could understand messages passed using animation. Item 1 has mean score of 2.6 and standard deviation of 2.9. This indicates that postgraduate students could combine text, audio, and video in knowledge sharing. Item 2 has mean score of 2.5 and standard deviation of 2.9. This indicates that postgraduate students get better understanding of using a combination of text, audio & video. Item 5 has mean score of 2.5 and standard deviation of 2.9. This shows that postgraduate students understand the use of symbols in knowledge transfer. On the other hand, item 3 has the mean score of 2.2 and standard deviation of 2.9. This indicates that LIS postgraduate students lacked the digital literacy to use graphics in communication. However, the weighted mean indicates that LIS postgraduate students in state universities in South-South, Nigeria, possessed the multimedia literacy to exploit the potentials of ubiquitous learning.

Hypothesis One: There is no significant relationship between mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

Table 5. Summary of Pearson Product Moment Correlation between Mobile Computing Literacy and Ubiquitous Learning in State Universities in South-South, Nigeria.

SN	Variables		Mobile Computing Literacy	Ubiquitous Learning
1	Mobile Computing Literacy	Pearson Correlation	1	0.832
		Sig. (2-tailed)		0.001
		N	214	214
2	Ubiquitous Learning	Pearson Correlation	0.832	1
		Sig. (2-tailed)	0.001	
		N	214	214
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 5 shows the pair of mobile computing literacy and ubiquitous learning obtained a correlation coefficient of r = 0.832. This indicates a positive and high relationship and is statistically significant at 0.05 alpha level (Sig. 0.001 < 0.05). Consequently, the null hypothesis which stated that there is no significant relationship between mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria, was rejected. There is, therefore, a significant relationship between mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria.

Hypothesis Two: There is no significant relationship between cloud computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria.

Table 6. Summary of Pearson Product Moment Correlation between Cloud Computing Literacy and Ubiquitous Learning in State Universities in South-South, Nigeria

SN	Variables		Cloud Computing Literacy	Ubiquitous Learning
1	Cloud Computing Literacy	Pearson Correlation	1	0.532
		Sig. (2-tailed)		0.001
		N	214	214
2	Ubiquitous Learning	Pearson Correlation	0.532	1
		Sig. (2-tailed)	0.001	
		N	214	214
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 6 shows that the pair of cloud computing literacy and ubiquitous learning obtained a correlation coefficient of r = 0.532. This indicates a positive and moderate relationship and is statistically significant at 0.05 alpha level (Sig.0.001 < 0.05). As a result, the null hypothesis which stated that there is no significant relationship between cloud computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria, was rejected. There is, therefore, a significant relationship between cloud computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria.

Hypothesis three: there is no significant relationship between social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

Table 7. Summary of Pearson Product Moment Correlation between Social Media Literacy and Ubiquitous Learning in State Universities in South-South, Nigeria

SN	Variables		Social Media Literacy	Ubiquitous Learning
1	Social Media Literacy	Pearson Correlation	1	0.899
		Sig. (2-tailed)		0.001
		N	214	214
2	Ubiquitous Learning	Pearson Correlation	0.899	1
		Sig. (2-tailed)	0.001	
		N	214	214
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 7 shows that the pair of social media literacy and ubiquitous learning obtained a correlation coefficient of r = 0.899. This indicates a positive and high relationship and is statistically significant at 0.05 alpha level (0.001 < 0.05). Hence, the null hypothesis which stated that there is no significant relationship between social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria, was rejected. There is, thus, a significant relationship between social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria.

Hypothesis Four: there is no significant relationship between multimedia literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria.

Table 8. Summary of Pearson Product Moment Correlation between Multimedia Literacy and Ubiquitous Learning in State Universities in South-South, Nigeria

SN	Variables		Multi-media Literacy	Ubiquitous Learning
1.	Multi-media Literacy	Pearson Correlation	1	0.565
		Sig. (2-tailed)		0.001
2.		N		
3.			214	214
4.	Ubiquitous Learning	Pearson Correlation	0.565	1
		Sig. (2-tailed)	0.001	
		N	214	214
*. Correlation is significant at the 0.05 level (2-tailed).				

Table 8 shows that the pair of multi-media literacy and ubiquitous learning obtained a correlation coefficient of r = 0.565. This denotes a positive and moderate relationship and is statistically significant at 0.05 alpha level (Sig. 0.001 < 0.05); therefore, the null hypothesis which stated that there is no significant relationship between multi-media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria, was rejected. There is a significant relationship between multi-media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria.

Discussion of the Findings

Mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

The result of hypothesis one shows that there is a positive and high relationship between mobile computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria. This implies that mobile computing literacy of postgraduate students is crucial in leveraging ubiquitous learning as it could enable postgraduate students to use mobile phones to access the internet, share information using mobile devices, download files, documents using laptop, engage in online classroom using smart phones, and collaborate with educators using mobile devices. It could also afford them the opportunities to use their devices to submit assignments and projects, get announcements, interact with lecturers and undertake other educational activities. On the other hand, if postgraduate students lack mobile computing literacy it could constitute a threat to the future method of teaching and learning in the academia. This is because mobile computing has created a revolution with new advances, new ideas and new users for

machines that are considered useful for handful of tasks. Thus, with the scope and ubiquity of computer technology, it should be noted that digital services are driven by user needs and as long as users continue to follow technological trends, there will be continuous growth in the mobile computing. Also, with high-speed connections probably becoming ubiquitous in the future, the accessibility and popularity of mobile computing will only increase further and with new innovations like Li-Fi technology, internet will be accessible through the light of all things.

This study is incongruent with that of Mwalukasa (2023) on postgraduate students' use of mobile phones as a supporting tool for learning at Sokoine University of Agriculture, Tanzania and discovered that few respondents mobile phones to upload and share information on various websites The result of this study states that there is a significant relationship between computing technologies and ubiquitous learning could be due to the role mobile computing performs in learning everywhere and students ability to use mobile computing tools in learning.

Cloud computing literacy of LIS Postgraduate Students and Ubiquitous Learning in State Universities in South-South, Nigeria

The result of hypothesis two shows that there is a significant relationship between Cloud computing literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria. This implies that cloud computing literacy skills are imperative in adopting ubiquitous learning as it could enable postgraduate students to share files and document through emails, make use of online databases, subscribe to YouTube, and access online lecture and also allow teachers to store teaching and learning materials, assignments, administer quizzes, and carry out learning activities as well as facilitate learning activities where the students can employ mobile applications including Google drive, Google slides, Google docs, and other additional learning materials through E-dictionary, Google Translate, Google Images, Google-dictionary, and Wikipedia. On the other hand, lack of cloud computing literacy could be a threat to facilitating the adoption of technological methods of teaching and learning in the LIS education as Madhav et al. (2018) rightly noticed that students had problems with the usage of cloud computing due to lack of skills whereas if they could actually learn more through practical experience that would enable cloud computing literacy which could facilitate and enhance their adoption of ubiquitous learning opportunities. This study is consistent with Omehia and Nsirim (2022) on computing technologies and paperless classroom in library schools in Rivers State and revealed that there was a significant relationship between cloud computing skills and paperless classroom in library schools in Rivers State. The finding of this study that there is a significant relationship between cloud computing literacy of LIS postgraduate students and ubiquitous learning could be due to the realization of the need to exploit the potentials of cloud computing in learning as well as the students literacy toward the use of cloud computing tools.

Social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

The result of hypothesis three revealed that there is a significant relationship between social media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria. This indicates that with social media literacy postgraduate students will have enhanced experience and perhaps motivation in leveraging the ubiquitous learning tool as it could enable postgraduate students to enable postgraduate students to chat using WhatsApp, take lectures through Facebook, subscribe to YouTube channels, use Skype, link to learning websites via social media. Etim et al. (2016) discovered that usage of the social media facilitated a significant difference in performance between those who used the social media network and those who did not. On the other hand, without social media literacy, postgraduate students will not be able to exploit the benefits of using social media tools in ubiquitous learning such as share learning resources, engage in peer review, and write personal/reflective blogs concerning their learning experiences. However, this study is in line with the study of Imoke et al (2021) who studied social media as teaching/learning tools in Nigerian tertiary institutions: contributory driver to 21st century inclusive education efforts and revealed that students had favourable perceptions concerning utilization of the social media tools for teaching/learning as a vital contributor towards driving the 21st century inclusive education efforts as they agreed that social media increased their academic-based task solving abilities, enabled them to contribute more meaningfully to class related critical thinking issues, upgraded their commitment toward learning from colleagues' academic related mistakes, enhanced their creative and research skills, boost willingness to chat with friends concerning academic related issues, and strengthened self-taking desires for posting on academic learning platforms. The result of this study could be attributed to high extent of social media literacy of postgraduate students and the proliferation of social media platforms and their use in academic activities particularly in ubiquitous learning.

Multi-media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria

The result of hypothesis four revealed that there is a significant relationship between multi-media literacy of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria. This implies that multimedia literacy could influence postgraduate students utilization of ubiquitous learning tool since it could help them to combine text, audio, and video in knowledge sharing, get better understanding of a concept of using a combination of text, audio & video, understand the use of graphics in communication, understand messages passed using animation, and understand the use symbols in knowledge transfer. On the other hand, without multi-media literacy, postgraduate students would find it difficult

to harness the potentials of ubiquitous learning due to the features of ubiquitous learning which cannot do without multimedia contents. However, the study supports the study of Oshinaike and Adekunmisi (2012) on the use of multimedia for teaching in University of Ibadan and discovered that although the majority of the respondents did not have access to the multimedia resources on campus, they used the materials at their homes and cybercafés.

Conclusion

The modern educational system is hopefully expecting more innovations in the method of teaching and learning. This is in addition to the improved system which has integrated various learning innovations into the system such as e-learning, online, learning, mobile learning, and ubiquitous learning. Notwithstanding, dealing with the improved educational system that has brought in the concept of ubiquitous learning requires digital literacy. This study investigated digital literacy of library and information science postgraduate students and ubiquitous learning in state universities in South-South, Nigeria, and revealed that there is a significant relationship between digital literacy (mobile computing literacy, cloud computing, social media literacy, multimedia literacy, virtual classroom literacy, basic computer literacy, and information retrieval literacy) of LIS postgraduate students and ubiquitous learning in state universities in South-South, Nigeria. Thus, students' ability to manipulate mobile computing, cloud computing, social media, multimedia, virtual classroom, basic computer operations, and information retrieval will help in facilitating and promoting the adoption ubiquitous learning.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Postgraduate students in library schools in South-South should continue to leverage mobile computing in learning.
2. Postgraduate students should improve on the use of cloud computing. This should be done by constantly utilizing cloud computing facilities such as GoogleDocs, OneDrive, etc.
3. Social media should be fully utilized in teaching and learning at the postgraduate level.
4. Library schools in South-South should deploy state-of-the-art multimedia enabled tools. The tools such as smart board should not only be deployed but be accessible and usable by postgraduate students for Power Point presentation.

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Umiejętności cyfrowe absolwentów bibliotekoznawstwa i informacji naukowej oraz wszechobecne nauczanie na uniwersytetach państwowych, południe-południe, Nigeria

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Dr Onyema Nsirim jest bibliotekarzem i wykładowcą w Instytucie Bibliotekoznawstwa i Informacji Naukowej Stanowego Uniwersytetu Nauki i Technologii w Enugu. Uzyskał swój licencjat bibliotekoznawstwa i informacji naukowej na Uniwersytecie w Ilorin w Ilorin, tytuł magistra i doktora bibliotekoznawstwa i informacji naukowej na Uniwersytecie Edukacyjnym Ignatius Ajuru w Port Harcourt. Jest Certyfikowanym Bibliotekarzem (CLN) przez Radę Rejestracji Bibliotekarzy Nigerii (LRCN) oraz Sekretarzem Nigeryjskiego Stowarzyszenia Bibliotek (NLA), Rivers State Chapter. W obszarze jego zainteresowań znajduje się bibliotekarstwo cyfrowe.

Dr Oluchi Okeke jest bibliotekarzem i kierownikiem Katedry Bibliotekoznawstwa i Informacji Naukowej na Państwowym Uniwersytecie Nauki i Technologii w Enugu. Jest certyfikowanym bibliotekarzem (CLN) przez Radę Rejestracji Bibliotekarzy Nigerii (LRCN)

i członkiem różnych stowarzyszeń zawodowych, w tym Nigeryjskiego Stowarzyszenia Bibliotek (NLA), Krajowego Stowarzyszenia Edukatorów Bibliotek i Informacji Naukowej.

Słowa kluczowe: umiejętności cyfrowe; wszechobecne uczenie się; przetwarzanie mobilne; chmura obliczeniowa; Multimedia; media społecznościowe

Streszczenie: W badaniu badano umiejętności cyfrowe studentów studiów podyplomowych z zakresu bibliotekoznawstwa i informacji naukowej oraz wszechobecnego uczenia się na uniwersytetach stanowych w południowo-południowej Nigerii. Badanie przyświecało czterem (4) celom, czterem pytaniom badawczym i czterem hipotezom. Hipotezy przetestowano na poziomie istotności 0,05. W badaniu przyjęto projekt korelacyjny, a populacja liczyła 221 osób składających się ze studentów studiów podyplomowych z bibliotekoznawstwa i informacji naukowej z ośmiu (8) uniwersytetów stanowych w południowo-południowej Nigerii. Technika doboru próby spisowej została wykorzystana do wybrania całej populacji liczącej 221 osób, które reprezentują wielkość próby. Do zbierania danych wykorzystano narzędzie zatytułowane “Digital Literacy of Library and Information Science Postgraduate Students and Ubiquitous Learning Questionnaire” (DLLISPSULQ). Niezawodność przyrządu została uzyskana za pomocą metod test-retest i została określona za pomocą metody Alphy Cronbacha, która dała współczynnik niezawodności 0,89. Badanie analizowano przy użyciu średniej i odchylenia standardowego dla pytań badawczych oraz współczynnika korelacji Pearsona dla hipotez. Okazało się, że istnieje istotny związek między umiejętnościami cyfrowymi studentów studiów podyplomowych LIS a wszechobecnym uczeniem się na uniwersytetach stanowych w południowo-południowej w Nigerii. Zalecono, aby szkoły bibliotekoznawstwa i informacji naukowej w południowo-południowej Nigerii w ramach polityki pokierowały wszystkich nauczycieli LIS w stronę przyjęcia stosowania wszechobecnych technologii w nauczaniu w celu zwiększenia przyjęcia wszechobecnego uczenia się przez studentów studiów podyplomowych.

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Die Fähigkeit zur Nutzung digitaler Technologien unter Absolventen von Aufbaustudiengängen in Bibliotheks- und Informationswissenschaftsowie die Verbreitung des Lernens an den staatlichen Universitäten in der Region South-South, Nigeria

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Schlüsselworte: digitale Kompetenzen; allgegenwärtiges Lernen; mobiles Computing; Cloud-Computing; Multimedia; soziale Medien

Zusammenfassung: Die Studie bezog sich auf die digitalen Kompetenzen der Studierenden in Aufbaustudiengängen im Fach Bibliotheks- und Informationswissenschaft sowie das allgegenwärtige Lernen an den staatlichen Universitäten im Südteil Nigerias. Sie basierte auf vier Zielen, vier Forschungsfragen und vier Hypothesen. Die Hypothesen wurden auf dem Signifikanzniveau von 0,05 getestet. Die Studie nahm ein korrelatives Design an und die Population umfasste 221 Personen, darunter Studierende der Aufbaustudiengänge in Bibliotheks- und Informationswissenschaft von acht staatlichen Universitäten im südlichen Teil Nigerias. Zur Auswahl der gesamten Population von 221 Personen, die die Stichprobengröße darstellte, wurde die Zählungstechnik angewendet. Zur Datenerhebung wurde ein Instrument genannt „Digitale Kompetenzen von Aufbaustudenten in Bibliotheks- und Informationswissenschaft und allgegenwärtiges Lernen" (DLLISPSULQ) verwendet. Die Zuverlässigkeit des Instruments wurde mit der Test-Retest-Methode und der Cronbachs Alpha-Methode bestimmt, die einen Zuverlässigkeitskoeffizienten von 0,89 ergab. Die Studie wurde unter Verwendung des Mittelwerts und der Standardabweichung für die Forschungsfragen sowie der Pearson-Korrelation für die Hypothesen analysiert. Es wurde ein signifikanter Zusammenhang zwischen den digitalen Kompetenzen der Aufbaustudenten in LIS und allgegenwärtigem Lernen an den staatlichen Universitäten in South-South in Nigeria festgestellt. Es wurde empfohlen, dass Bibliotheks- und Informationsschulen in South-South in Nigeria als politische Maßnahme allen LIS-Pädagogen vorschreiben, den Einsatz allgegenwärtiger Technologien im Unterricht zu übernehmen, um die Akzeptanz des allgegenwärtigen Lernens durch die Aufbaustudenten zu erhöhen.

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