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| RESEARCH ARTICLE

COMPUTER LECTURERS' COMPETENCY NEEDS IN UTILIZATION OF DIGITAL TECHNOLOGIES FOR INSTRUCTIONAL DELIVERY IN COLLEGES OF EDUCATION IN SOUTH-SOUTH, NIGERIA

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| ABSTRACT

This study investigated the competency needs of computer lecturers in the utilization of digital technologies for instructional delivery in Colleges of Education in South-South, Nigeria. The research specifically focused on competencies in Learning Management Systems (LMS) and cloud computing platforms. A descriptive survey research design was adopted, with a population of 255 comprising computer lecturers and experts from federal universities. A sample of 156 respondents was selected using stratified and simple random sampling techniques. Data were collected using a researcher-developed questionnaire titled "Computer Lecturers' Competency Needs in Utilization of Digital Technologies for Instructional Delivery (CLCNUDTID)," which was validated by experts and demonstrated high reliability with a Cronbach's alpha coefficient of 0.89. Data analysis involved mean, standard deviation, and independent samples t-test. The findings revealed a significant competency gap, indicating that computer lecturers need all identified LMS and cloud computing competencies for effective instructional delivery. The t-test results further showed a significant difference between the mean responses of experts and lecturers, confirming the existence of this gap. The study concludes that the current competency levels of computer lecturers are insufficient, highlighting an urgent need for targeted professional development programs. It is recommended that educational administrators and policymakers institute training initiatives to equip computer lecturers with the necessary digital competencies to enhance instructional delivery in Colleges of Education.

| KEYWORDS

Competency Needs, Digital Technologies, Instructional Delivery, Learning Management System, Cloud Computing, Computer Lecturers, Colleges of Education

| INTRODUCTION

Education is seen as a veritable tool for all round development of man. In view of that, education is defined as a process by which man is made useful through the inculcation of moral and acceptable ethical standards for wide

understanding and effective utilization of the resources within his environment and beyond (Okolie *et al.*,2019). According to Udensi (2022), education is a process of assisting a learner to acquire knowledge, competencies, acceptable attitudes and moral behaviours that would make the learner a responsible citizen, able to take care of himself and his family and be more functional in his environment. The author maintained that education develop individuals to develop their environment and ultimate nation from generation to generation. The Federal Republic of Nigeria (FRN), in its National Policy on Education (FRN, 2013) affirmed that quality education empowers its recipients with the appropriate competencies, knowledge, values to adapt and contribute effectively in national development. Thus, education takes place at different settings and places including the tertiary institutions.

Tertiary institutions according to Okolie *et al.* (2019), are educational institutions established with the aim of training students to acquire appropriate vocational competencies, knowledge, attitudes, habits of thoughts and qualities of character that enable them develop intellectual, social, physical, emotional and economic capabilities to become self-reliant and thus contribute to economic growth and development of their nations. Okolie *et al.* (2019) further identified some subjects offered in tertiary institutions to include; Computer science, carpentry work, Electrical and Electronics repairs and installations among others. Computer science cannot be taught effectively and the goals of Computer Science achieved maximally without the active participation of a competent lecturer. A lecturer in this context can be defined as an individual who through training acquires acceptable capacities for molding an individual to become responsible in all spheres of life. Lai, *et al.* (2019) posited that a lecturer is a facilitator of learning who helps students to realize their full potentials educationally, emotionally, and socially in career selection and transition. As avowed by Aireruor (2020), a lecturer is a person who helps others to acquire knowledge, competencies or values. In essence, the lecturer plays immeasurable role in ensuring that the recipients acquire desirable knowledge which can enhance the development of the individual and that of the economy. Hence, the stated function(s) of the lecturer can only be actualized if the lecturer is competent enough in his/her area of specialisation. The role and expertise of teachers as maintained by Cuban (2013), are critical because teachers are at the front line of designing and delivering the learning experiences. It has been well argued that just making technology available in schools does not mean that lecturers will make use of the technology, nor will it necessarily be used effectively. Hence, the need for a competent teacher in various areas of study.

Competency, simply put, is the ability to display mastery of skills or knowledge. It can be defined as the capacity to effectively carry out a specific task with a touch of excellence. Blignaut and Botha (2024) defined competency as the ability of an individual to apply knowledge and experience that had been possessed in a certain area to perform a function carefully, accurately and objectively. Olga (2018) stated that competency is more than just knowledge and skills; it involves the ability to meet complex demands by drawing on and mobilising psychosocial resources (including skills and attitudes) in a particular context. Competency is essential to an educator's pursuit of excellence. Olga maintained that teachers need a wide range of competencies in order to face the complex challenges of today's digital world.

The digital world is increasingly penetrating the education and competencies domain, with technology gradually being used to deliver education, knowledge and competencies in new and innovative ways. This penetration is coupled with future changes to the mode and

pattern of work, which are themselves affected by the current climate of economic uncertainty, as well as by political shifts. Zakka *et al.* (2020) reported that the effective application of digital technologies in teaching will facilitate the realization of the stated objectives of the educational programme, by improving innovativeness, curiosity and creativity of the learners.

Broadly, digital technologies include the use of personal computers, digital television, radio, mobile phones, robots and many more. The term is used to describe the use of digital resources to effectively find, analyze, create, communicate, and use information in a digital context. This includes the use of web tools, digital media tools, programming tools and software applications. Similarly, Bates (2021) expatiated that digital technology includes all types of electronic equipment and applications that use information in the form of numeric code. This information is usually in binary code that is, code that can be represented by strings of only two numeric characters (0s and 1s). Devices that process and use digital information include personal computers, calculators, automobiles, traffic light controllers, compact disc players, cellular telephones, communications satellites, and high-definition television sets.

Given the increased use of fast changing digital technologies in the workplace, new competencies need have emerged. The rapid evolution of digital technologies and the increasing complexity that comes with its exploding potential, explains why digitalisation in education continues to receive special attention. Digital technologies also drive innovation in many different spheres of life. The innovative capacity of technology is very much conditioned by the level of digital competencies of the population (Kyari *et al*., 2018). No wonder there is a very strong correlation between education and competencies and the uptake and use of digital technologies in various spheres of life.

Digital technology competency involves the ability, confident, critical and responsible use of and engagement with, digital technologies for learning, at work and for participation in society (Bates, 2021). It includes information and data literacy, communication and collaboration, digital content creation (including programming), safety (including digital well-being and competencies related to cyber security), and problem solving (UNESCO, 2018). This definition emphasises engagement with digital technologies, the growing importance of digital technology use for education purposes and the need to actively promote digital technologies in teaching and learning and seize technological opportunities so that education can keep up with other sectors. Akanne (2022) listed digital technology competencies to include competencies in Learning management System and Cloud computing.

Learning Management System (LMS) is a digital platform that facilitates the management, delivery, and evaluation of educational content and activities. LMS tools support both formal and informal learning environments, enabling educators to design courses, share resources, and assess learners' progress. According to Ng'ambi and Bozalek (2013), LMS platforms are pivotal in enhancing teaching and learning efficiency by centralizing resources and creating a collaborative space for students and instructors. LMS platforms enable users to demonstrate digital competencies such as data literacy, collaboration, and problem-solving in real-time, thus contributing to broader educational goals. As Krumsvik in Ottestad (2014) emphasized, a teacher’s ability to use ICT effectively within pedagogical frameworks significantly impacts learners' educational experiences. Learning management system works better when cloud computing is introduced as it empowers learning management system platforms

to deliver flexible and modern learning experiences.

Cloud computing is a transformative technology that allows users to access computing resources, such as servers, storage, databases, and software, over the internet. This technology eliminates the need for physical infrastructure, enabling educational institutions to adopt cost-effective and scalable solutions. According to Armbrust *et al.* (2020), cloud computing has profoundly impacted education by providing flexible, on-demand access to resources. Platforms like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud have empowered educators and learners with tools for collaboration, data analysis, and content storage. With these platforms, educators and learners can access vast computational resources and collaborate seamlessly from anywhere. Cloud computing enhances digital competencies by enabling the integration of multiple tools and applications into a unified learning ecosystem. For teachers, cloud platforms streamline tasks such as resource management and performance tracking, while for students, they provide opportunities to develop problem-solving and collaboration skills in a dynamic digital environment. This integration ensures that cloud computing remains a vital competency for adapting to the demands of the digital economy. Cloud computing serves as a foundation for social media through the provision of technological backbone that enables efficient social network. The use of these tools will equip students with skills needed to navigate and excel in a rapidly evolving digital landscape.

Digital competencies are considered important as educational technology tools and software solutions are deeply fixing its roots and branches into the fabrics of the society, as educational sector is not left behind. There are a lot of benefits accruing to teaching and learning with the digital technology competencies application, which are: the learner can participate from long distance teaching during online class without being physically present with the teacher in the classroom. While the teacher can deliver the lecture at any comfortable time and place when connected to the internet with the right technology and software. Also, in a case of unforeseen closure of schools as experienced during the Coronavirus pandemic (COVID-19). Kiryakova and Kozhuharova (2024) asserted that such unpredicted situation has shown the need to be equipped apart from adequate infrastructure and bandwidth, that, teachers need digital competencies to transform the well-established face to-face teaching into teaching in a virtual environment. Kiryakova and Kozhuharova emphasized that, it is not a question of digital competencies becoming part of education and teaching, but of education and teaching becoming more strongly part of a digitizing world.

It is no news that digital technology has become a pedagogical tool for teachers of higher education in recent times. A teacher's digital competence can consist of "a set of competencies, abilities, and attitudes that the teacher must develop to incorporate digital technologies into their practice and professional development". According to Esteve-Mon *et al*. (2016), Digital competence is not only having certain abilities, knowledge and attitudes but also the capacity to put these in action and mobilize them in certain educational context. Instefjord and Munthe (2017) asserted that educators are expected to enhance their digital competencies and that of their students. Regrettably, Kiryakova and Kozhuharova (2024) stated that despite the popularity of digital devices and educational tools, educational institutions and teachers are still struggling on how to integrate technologies into the curriculum and prepare students for their digital futures. Therefore, teachers need digital competencies to be able to integrate technologies successfully into their teaching and conduct online classes with their students. To ensure adequate and

efficient use of the digital technologies for the purpose of instructional delivery in South-South Nigeria, it is necessary to investigate the competencies needed of computer lecturers in Colleges of Education in South-South Nigeria.

Ojo (2024) examined the impact of Learning Management System (LMS) on university undergraduate student's academic performance. The study adopted quasi experimental design, the data for the study were collected through the use of online questionnaire and students' academic achievement scores in Test and Measurement. The study sample comprised one hundred and four (104) university undergraduate students of Ajayi Crowther University Oyo. The result of the study revealed that there was positive relationship between the use of LMS and students' academic performance. The findings of the study also revealed that there was significant difference in academic performance of both male and female university undergraduate students taught with LMS and those that were taught with traditional method. The study further revealed that the usage of LMS is hindered with some factors among which are low levels of commitment of the lecturers to the use of LMS, lack of ICT based learning strategy as well as inability of lecturers to provide the needed technical support. The study equally revealed that effective usage of LMS can be recorded by organizing ICT training for both the lecturers and students and improvement of infrastructural facilities will go a long way in improving the effective usage of LMS for teaching and learning process. Based on the findings of the study, it was recommended that the use of LMS should be encouraged in Nigeria tertiary institutions, lecturers and students should be encouraged to improve their computer literacy skills for effective usage of LMS, government and curriculum development agencies should incorporate learning management system usage into tertiary institutions' curriculum as one of the modes of instructional delivery and that learning management system facilities should be adequately provided in Nigeria tertiary institutions.

The true relationship between this work and the present study is that, both examine digital technologies although this work investigated the impact of Learning Management Systems (LMS) on undergraduate students' academic performance while the current work examined computer lecturers' competency needs in South-South Nigeria, as it underscores the necessity for lecturers to possess both technical and pedagogical skills in utilizing digital technologies.

Jimoh (2022) investigated the level of awareness and utilization of cloud computing for information storage and retrieval in selected academic Libraries in South West Universities in Nigeria. This is against the background of the low level of awareness among the universities-based Libraries in Nigeria. Descriptive survey method was adopted while a questionnaire, observations and checklists were used for data collection. The research study used stratified sampling techniques to select the University Libraries and Librarians and staff from the South West Geo-Political Zone on the probability or otherwise integration of cloud computing. A total of one hundred and twenty (120) librarians and Staffs of the selected universities was used as population of the study across the six (6) Universities selected for the study. Data were analyzed using Pearson Product moment correlation at 0.05 level of significance. The result of impact of cloud computing had mean score of (= 3.25) indicating a high impact of information services and retrieval. The awareness level of cloud computing was moderate at (x = 2.88), utilization of cloud computing was high at (x = 3.26), the level of challenge was moderate at (x = 2.79), while the level of benefit derivable from the use of cloud computing was high at (x = 3.29). The study reveals a positive and joint relationship

between Awareness, Utilization, challenges and benefit of cloud computing on information services and retrieval in University Libraries in South West Geo-Political zone. The study by Jimoh (2022), which explored awareness and utilization of cloud computing for information storage and retrieval in academic libraries of southwest Nigerian universities, is relevant to the study on Computer Lecturers' Competency Needs in Utilization of Digital Technologies for Instructional Delivery in Colleges of Education in South-South Nigeria as it highlights the growing importance of cloud-based technologies in academic environments. Understanding the extent to which digital tools like cloud computing are adopted in educational settings underscores the need for computer lecturers to develop competencies in such technologies. This is crucial for enhancing instructional delivery and ensuring that lecturers can effectively integrate advanced digital resources into teaching, thereby improving access to educational materials and fostering a more technology-driven learning atmosphere in Colleges of Education.

| Statement of the Problem

The need for effective teaching of computer courses in Nigerian Colleges of Education cannot be overemphasized in today's technology driven society. The national benchmark and minimum standard for Computer Science in Colleges of Education is geared towards the usage of computer skills. This is because computers are used ubiquitously on daily basis in every organization including the Colleges of Education. Despite the increasing integration of digital technologies into educational settings, it is widely acknowledged that there is competency gab that leads to preference for computer lecturers who possess less quality. It has been observed that there is low level of skills acquisition and poor application of skills to practical situations among Computer lecturers from tertiary institutions including Colleges of Education in South-South, Nigeria. Also, there is a lack of instructional purposes in the teaching of Computer Science (Agbo, 2019). However, many educators, particularly in South-South Nigeria, also seems to lack the necessary skills to leverage these technologies fully, it is against this background that the researcher intend to investigate the computer lecturers' competency needs in the utilization of digital technologies for instructional delivery in Colleges of Education in South-South Nigeria.

| Purpose of the Study

The main purpose of this study was to determine computer lecturers' competency needs in utilization of digital technologies for instructional delivery in Colleges of Education in South - South, Nigeria. The study was designed specifically to:

1. Determine computer lecturers' competency needs in utilization of learning management system for instructional delivery in Colleges of Education in South-South, Nigeria.
2. Assess computer lecturers' competency needs in utilization of cloud computing platforms for instructional delivery in Colleges of Education in South-South, Nigeria.

| Research Questions:

The following research questions were raised to guide the study:

1. What are the computer lecturers' competency needs in utilization of learning management system for instructional delivery?
2. What are the computer lecturers' competency needs in utilization of cloud computing platforms for instructional delivery?

| Research Hypotheses:

The following null hypotheses were formulated to guide the study and tested at .05 alpha level of significance:

$H0_1$ There is no significant difference in the Mean responses of experts on the competency needs of computer lecturers in the utilization of learning management system for instructional delivery.

$H0_2$ There is no significant difference in the Mean responses of experts on the competency needs of computer lecturers in the utilization of cloud computing platforms for instructional delivery.

RESEARCH METHODS

This study employed a descriptive survey research design. The study area covered by this research is South-South, Nigeria. The population for the study is 255 comprised of 131 Computer Science lecturers from the eight (8) accredited state own Colleges of Education in south – south Zone of Nigeria and 124 experts in Federal Universities in the six States of South-South geopolitical zone of Nigeria. The sample of the study consisted of 156 respondents, comprising 80 experts and 76 computer studies lecturers using Taro Yamane formula to obtain the sample size. The experts and Computer Science lecturers were stratified into six clusters representing the six states in the South-South. The decision by the researcher to adopt this technique was because it provides all lecturers in the population an equal chance of being selected and the selection was done based on Colleges of Education that offers Computer Science. Then the experts and computer science lecturers were randomly sampled using simple random sampling techniques.

A researcher-developed instrument titled "Computer Lecturers' Competency Needs in Utilization of Digital Technologies for Instructional Delivery (CLCNUDTID) Questionnaire was used in collecting data from both computer Science lecturers and experts. The questionnaire was divided into two parts each (A and B). Part A contained personal data of the respondents. Part B contained statements on the independent sub-variables which were grouped into five sections. Responses were made using 4-point rating scale of Very Highly Required (VHR), Highly Required (HR), Lowly Required (LR), and Very Lowly Required (VLR) for experts and Very Highly Possessed (VHP), Highly Possessed (HP), Lowly Possessed (LP) and Very Lowly Possess (VLP). In order to ensure that the research instrument was capable of eliciting the required information from the respondents, the instrument was subjected to face validation. The pool of the instrument was given to three experts – two from Computer Education and one from the Department of Curriculum Studies, Educational Management and Planning, University of Uyo. The reliability of the instrument was determined through trial-testing of the instrument administered to 30 respondents randomly selected of which 15 were experts from federal universities South- south Nigeria and 15 were computer science lecturers from Federal Colleges of Education south – south Nigeria who were not part of the sample but were part of the population. The outcome of the respondents was subjected to Cronbach Alpha analysis to determine the internal consistency of the instrument. A reliability coefficient of 0.89 was obtained to justify the instrument reliable for the study. Copies of the instrument were administered to the respondents on the sample of 156 experts and computer lecturers in six Universities and six Colleges of Education in South-South, Data collected were analyzed using Mean ($\dot{X}$) and Improvement Need Index (INI) in answering the research questions. The weighted Mean of competency by experts was represented by standard ($\dot{X}E$) while the weighted Mean for competency of Computer Science lecturers was represented by ($\dot{X}P$). The difference between the two ($\dot{X}E$-$\dot{X}P$) were determine to indicate the

Competency Gap (CG) which yielded a positive or a negative value.

Results

Research Question 1

What are the computer lecturers' competency needs in utilization of learning management system for instructional delivery in Colleges of Education in South-South, Nigeria?

Table 1: Mean of responses on LMS competencies needed by computer lecturers for instructional delivery n = 158

S/N	Items	Expert Mean	Lecturer Mean	Mean Difference	Remark
1	Ability to create course content on an LMS.	3.71	2.37	1.46	Needed
2	I can effectively schedule virtual classes using an LMS.	3.70	2.00	1.70	Needed
3	Skilled in using LMS tools for evaluating student performance.	3.51	2.06	1.45	Needed
4	Ability to use an LMS to facilitate online discussions.	3.73	2.12	1.61	Needed
5	Ability to organize multimedia resources (e.g., videos, audio) on an LMS for instructional use.	3.51	2.19	1.32	Needed
6	Ability to integrate external tools or plugins (e.g., quizzes, assignments) into the LMS.	3.74	2.37	1.37	Needed
7	Skilled in providing timely feedback to students through the LMS.	3.76	2.18	1.58	Needed
8	Ability to manage student access within the LMS.	3.51	1.56	1.95	Needed
9	Ability to generate reports from the LMS to improve instructional delivery.	3.75	1.74	2.01	Needed
10	Skilled in troubleshooting common issues encountered by students when using the LMS.	3.50	1.93	1.57	Needed

Source: Field data (2024)

The result in Table 1 indicates a significant gap between the expected competency of computer lecturers in Colleges of Education in South-South, Nigeria, and the actual competency level of the lecturers in utilizing Learning Management Systems (LMS) for instructional delivery. The result showed a significant Mean difference, ranging from 1.32 to 2.01, indicating a substantial skill need. The lecturers' Mean scores were consistently lower than the experts' mean scores, suggesting that the lecturers need competency in LMS. Areas where the lecturers need competency include navigating and utilizing the LMS platform, possessing adequate knowledge of LMS features, creating and uploading learning materials, monitoring student progress, facilitating online collaborative discussions, troubleshooting technical issues, assessing student learning, and integrating the LMS with other educational technologies.

Research Question 2

What are the computer lecturers' competency needs in utilization of cloud computing platforms for instructional delivery in Colleges of Education in South-South, Nigeria.?

Table 2: Mean of responses on cloud computing competencies needed by computer lecturers for instructional delivery n = 158

S/N	Items	Experts Mean	Lecturers Mean	Mean Difference	Remark

1	Confident in the use of cloud storage platforms (e.g., Google Drive, OneDrive) to store instructional materials.	3.56	2.34	1.22	Needed
2	Effectively use cloud-based collaborative tools (e.g., Google Docs, Microsoft 365) for joint content creation with students.	3.37	2.10	1.27	Needed
3	Skilled in managing access permissions for cloud resources to ensure secure delivery of instructional content.	3.44	1.97	1.47	Needed
4	Ability to integrate cloud computing platforms into instructional delivery to facilitate real-time collaboration.	3.38	1.92	1.46	Needed
5	Ability to use cloud-based Learning Management Systems (e.g., Canvas, Moodle) for managing instructional activities.	3.52	2.10	1.42	Needed
6	Competent in using cloud computing tools to back up instructional materials.	3.57	2.01	1.56	Needed
7	Ability to use cloud computing platforms to conduct virtual labs or simulations for teaching purposes.	3.62	1.95	1.67	Needed
8	Ability to evaluate cloud computing tools that align with specific instructional needs.	3.63	2.06	1.57	Needed
9	Skilled in integrating cloud-based communication tools (e.g., Zoom, Microsoft Teams) into my instructional process.	3.60	1.86	1.74	Needed
10	Confidently troubleshoot challenges related to the use of cloud computing platforms for instructional delivery.	3.43	1.77	1.66	Needed

Source: Field data (2024)

The result in Table 2 indicates a significant gap between the expected competency of computer lecturers in Colleges of Education in South-South, Nigeria, and the actual competency level of the lecturers in utilizing cloud computing for instructional delivery. All the items assessed showed a significant mean difference, ranging from 1.22 to 1.74, indicating a substantial skill need. The lecturers' mean scores were consistently lower than the experts' mean scores, suggesting that the lecturers need competency in the cloud computing. The lecturers need competency in various areas, including using cloud storage platforms, collaborative tools, managing access permissions, integrating cloud computing platforms, using cloud-based Learning Management Systems, backing up instructional materials, conducting virtual labs, evaluating cloud computing tools, integrating cloud-based communication tools, and troubleshooting challenges related to cloud computing.

Research Hypothesis 1

There is no significant difference between the mean response of experts and Computer lecturers on Learning Management System Skills for instructional delivery in Colleges of Education in South-South, Nigeria.

Table 3: t-test analysis on the difference in mean responses of experts and Computer lecturers' competency needs on Learning Management System for instructional delivery (df = 156)

S/N	Items	Groups	N	Mean	SD	t-value	p-value	Decision
1	Clearly define programming problems given in a programming environment.	Experts	76	3.71	0.442.			Significant
		Lecturers	82	2.37	0.995	13.33	.001	
2	Able to articulate the constraints of a programming task before starting to code.	Experts	76	3.70	0.494			Significant
		Lecturers	82	2.00	0.984	14.27	.001	
3	Able to break down complex programming problems into simpler manageable sub-problems.	Experts	76	3.51	0.496			Significant
		Lecturers	82	2.06	0.912	12.39	.003	
4	Able to determine the inputs/expected outputs for a programming problem effectively.	Experts	76	3.73	0.546			Significant
		Lecturers	82	2.12	0.985	10.01	.001	
5	Knowledge of specifying the requirements of a programming problem.	Experts	76	3.51	0.503			Significant
		Lecturers	82	2.19	0.885	14.22	.014	
6	Able to reframe or redefine programming problems when initial solutions are not feasible.	Experts	76	3.74	0.491			Significant
		Lecturers	82	2.37	0.840	18.06	.001	
7	Ability to use examples to illustrate the problem I am trying to solve in programming.	Experts	76	3.76	0.525			Significant
		Lecturers	82	2.18	0.923	13.07	.002	
8	Proficient in using problem statements to guide my coding process.	Experts	76	3.51	0.449			Significant
		Lecturers	82	1.56	0.867	19.38	.001	
9	Ability to distinguish between the essential and non-essential components of a problem.	Experts	76	3.75	0.478			Significant
		Lecturers	82	1.74	0.956	16.36	.001	
10	Ability to communicate the problem formulation process clearly to others.	Experts	76	3.50	0.485			Significant
		Lecturers	82	1.93	0.915	15.08	.003	

Significant at 0.05 alpha level and df = 156

The data in Table 3 of the independent samples t-test shows that there is a significant difference between the mean response of experts and computer lecturers' competency on Learning Management System skills for instructional delivery in Colleges of Education in South-South, Nigeria. The t-values for all the items range from 10.01 to 19.38, and the p-values are less than 0.05, indicating a significant difference between the two groups. The mean scores of the experts are consistently higher than those of the lecturers, indicating that the lecturers require improvement in their Learning Management System competency. The significant difference between the two groups suggests that the null hypothesis, which states that there is no significant difference between the mean response of experts and computer lecturers, was rejected. Therefore, there is a significant difference between the mean response of experts and computer lecturers' competency needs in Learning Management System for instructional delivery in Colleges of Education in South-South, Nigeria.

Research Hypothesis 2

There is no significant difference between the mean response of experts and Computer lecturers' competency needs on Cloud Computing

for instructional delivery in Colleges of Education in South-South, Nigeria.

Table 4: t-test analysis on the difference in mean responses of experts and Computer lecturers' competency needs on cloud computing for instructional delivery (df = 156)

S/N	Items	Groups	N	Mean	SD	t-value	p-value	Decision
1	Ability to break down a large programming task into smaller, more manageable modules.	Experts	76	3.56	0.499	9.50	.001	Significant
		Lecturers	82	2.34	1.11			
2	Ability to design modular code with well-defined interfaces.	Experts	76	3.37	0.533	10.72	.001	Significant
		Lecturers	82	2.10	1.10			
3	Ability to identify functions to handle specific parts of a programming task.	Experts	76	3.44	0.499	12.73	.081	Significant
		Lecturers	82	1.97	0.986			
4	Proficient in using problem decomposition skill to manage complex programming problems.	Experts	76	3.38	0.579	12.43	.001	Significant
		Lecturers	82	1.92	0.980			
5	Ability to prioritize sequence in the development of different modules in a program.	Experts	76	3.52	0.685	11.84	.006	Significant
		Lecturers	82	2.10	0.974			
6	Ability to integrate various modules into a cohesive program.	Experts	76	3.57	0.626	13.26	.022	Significant
		Lecturers	82	2.01	0.965			
7	Ability to Manage dependencies between different parts of a program effectively.	Experts	76	3.62	0.489	15.35	.001	Significant
		Lecturers	82	1.95	0.923			
8	Ability to use of pseudocode to plan the decomposition of a programming problem.	Experts	76	3.63	0.485	14.47	.001	Significant
		Lecturers	82	2.06	0.926			
9	Ability to assess the impact of changes in one module on other modules.	Experts	76	3.60	0.540	15.30	.001	Significant
		Lecturers	82	1.86	0.957			
10	Ability to Document the decomposition process to facilitate collaboration with others.	Experts	76	3.43	0.645	14.30	.001	Significant
		Lecturers	82	1.77	0.941			

Significant at 0.05 alpha level and df = 156

The result in Table 4 of the independent samples t-test shows that there is a significant difference between the mean response of experts and computer lecturers' competency on Cloud Computing for instructional delivery in Colleges of Education in South-South, Nigeria. The t-values for the 10 items range from 9.50 to 15.35, and the p-values are less than 0.05, indicating a significant difference between the two groups. The mean scores of the experts are consistently higher than those of the lecturers, indicating that the lecturers require improvement in their Cloud Computing competency. The significant difference between the two groups suggests that the null hypothesis, which states that there is no significant difference between the mean response of experts and computer lecturers, is rejected. Therefore, it can be concluded that there is a significant difference between the mean response of experts and computer lecturers' competency needs on Cloud Computing for instructional delivery in Colleges of Education in South-South, Nigeria.

| Discussion of Findings

The findings demonstrated a significant difference between the perceived Learning Management System (LMS) competency needs as identified by experts and the actual needs expected by Computer Lecturers in Colleges of Education in South-South, Nigeria. This divergence is supported by the statistically significant t-values and p-values obtained from the independent samples t-test, which reject the null hypothesis. The study support Adeoye and Adanikin (2020) who found that Nigerian lecturers face difficulties in adapting to digital instructional methods due to gaps in digital literacy and pedagogical application. This aligns with the study's findings, which indicate that lecturers may underestimate the extent of their LMS competency needs. Across all ten items assessed, the Mean scores of experts were consistently higher than those of lecturers. This indicates that experts perceive a greater need for lecturers to possess a wider range of LMS competencies than the lecturers themselves. This discrepancy can be attributed to several factors. Experts, likely with strong theoretical backgrounds in education and technology, may overestimate the extent to which lecturers possess practical LMS skills. They might assume a higher level of familiarity with LMS features, integration of LMS into teaching practices, and troubleshooting capabilities than what actually exists among lecturers. This aligns with the Competency-Based Education (CBE) theory, which emphasizes the importance of practical application and performance-based assessment. While lecturers may possess theoretical knowledge about LMS, their practical application of these skills in their teaching may be limited.

Computer Lecturers in Colleges of Education in South-South Nigeria may face limited opportunities for hands-on training and practical application of LMS technologies. This lack of practical experience can lead to a gap between their perceived needs and the actual competencies required for effective LMS utilization in their teaching. This finding is consistent with the TPACK framework, which emphasizes the importance of integrating technological knowledge with pedagogical practice. The availability and accessibility of reliable internet connectivity, adequate hardware, and technical support infrastructure can significantly impact the effective use of LMS. If these resources are limited or inadequate, lecturers may face challenges in utilizing LMS effectively, leading to a discrepancy between their perceived needs and the actual requirements. This aligns with the practical considerations emphasized within the CBE framework. Some lecturers may exhibit resistance to adopting new technologies due to factors such as lack of training, fear of failure, and a preference for traditional teaching methods. This resistance can lead to a disparity between the expectation for LMS competencies and the actual willingness to acquire and utilize these skills. The findings of this study demonstrated a significant difference between the perceived LMS competency needs of experts and Computer Lecturers in Colleges of Education in South-South, Nigeria. This discrepancy highlights the need for targeted professional development programs that address the specific LMS competency needs of lecturers, enabling them to effectively integrate these technologies into their teaching and enhance student learning outcomes. These programs should focus on practical skills development, hands-on experience with LMS platforms, and support for overcoming resistance to change.

The findings showed a significant difference between the expected Cloud Computing competency as identified by experts and the actual competency by Computer Lecturers in Colleges of Education in South-South, Nigeria. This divergence is supported by the statistically significant t-values and p-values obtained from the independent samples t-test, which reject the null hypothesis. Across all ten items assessed, the mean scores of experts were consistently higher than those of lecturers. This indicates that experts expected competency was for lecturers to possess a wider range of Cloud Computing competencies for effective instructional delivery. This discrepancy can be attributed to several factors. Lecturers may have limited practical experience in utilizing cloud-based tools and platforms in their teaching. This lack of hands-on experience can lead to an underestimation of the potential benefits

and challenges of integrating cloud computing into their instructional practices. This finding aligns with the CBE framework, which emphasizes the importance of practical skills and performance-based assessment. Lecturers may possess theoretical knowledge of cloud computing concepts but lack the practical skills to effectively apply them in their teaching. Lecturers may not be fully aware of the wide range of cloud-based tools and services available for education, such as collaborative platforms, virtual labs, and assessment tools. This lack of awareness can limit their ability to effectively utilize cloud computing in their teaching and may lead to an underestimation of their competency needs in this area. Lecturers may have concerns about data security and privacy when using cloud-based services, particularly when handling sensitive student information. These concerns may hinder their adoption and effective use of cloud computing tools in their teaching practices.

This finding aligns with Yusuf and Balogun (2022) who maintained that Continuous professional development and institutional support are critical to ensuring that lecturers can harness the full potential of cloud computing, creating engaging and efficient learning environments tailored to the needs of modern students. The finding also supports Hussain *et al.* (2018) who found out that while a majority of lecturers expressed a positive attitude towards cloud computing, they lacked the necessary skills to effectively utilize these tools for instructional purposes. The finding revealed a significant difference between the expected Cloud Computing competency and possessed Cloud Computing competency of Computer Lecturers in Colleges of Education in South-South, Nigeria. This discrepancy highlights the need for targeted professional development programs that address the specific Cloud Computing competency needs of lecturers, enabling them to effectively integrate these technologies into their teaching and enhance student learning outcomes. These programs should focus on hands-on training, practical application of cloud-based tools, addressing data security and privacy concerns, and providing ongoing support for lecturers in their use of cloud computing in education.

| Conclusion

It could be observed from the analyses that the Means of the experts are far higher than the Mean of the lecturers' competency. This implies that the competency of the lecturers are not sufficient enough, calling for more committed involvement in their competencies. This shows how important technologies are for lesson delivery because it will help the lecturer deliver lessons with ease, at convenience and comfort of their homes with the students. Based on this, it could be concluded that use of digital instructions is very necessary and all computer lecturers in Colleges of Education in South-South, Nigeria should key into the trend

| Educational Implications of Findings

The findings of this study provide crucial insights into the competency needs of computer lecturers in utilizing Learning Management Systems (LMS) and cloud computing, for instructional delivery in Colleges of Education in South-South, Nigeria. These findings have implications for students, teachers, parents, administrators, and policymakers, as detailed below:

Lecturers must receive targeted training to effectively utilize the digital tools. This will enable them to create engaging and organized digital content, assess students online, and provide meaningful feedback. Administrators need to allocate resources to support training programs and ensure that the platforms are user-friendly and accessible to lecturers and students. Policy revisions are necessary to mandate the integration and training in teacher education curricula and professional development initiatives.

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