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Lecturers' Digital Competence and Students' Access to Technology as Predictors of Hybrid Learning Readiness in Abia State Colleges of Education (Technical), Arochukwu

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Abstract- ***This study examined lecturers' digital competence and students' access to technology as predictors of hybrid learning readiness in Abia State College of Education (Technical), Arochukwu. The increasing integration of digital tools into teacher education has made hybrid learning an important instructional model for Colleges of Education in Nigeria. Hybrid learning combines face-to-face classroom interaction with online learning activities, thereby requiring lecturers who can design and deliver technology-supported lessons and students who possess adequate access to digital devices, internet connectivity and learning platforms. The study was guided by three research questions and three null hypotheses. A correlational survey research design was adopted. The population of the study comprised lecturers and NCE students in Abia State College of Education (Technical), Arochukwu. A sample of 265 respondents, made up of 45 lecturers and 220 students, was selected using stratified random sampling. Two instruments were used for data collection: Lecturers' Digital Competence Questionnaire (LDCQ) and Students' Technology Access and Hybrid Learning Readiness Questionnaire (STAHLRQ). The instruments were validated by experts in educational technology and measurement and evaluation. Reliability was established using Cronbach's alpha, yielding coefficients of 0.86 and 0.89 respectively. Mean and standard deviation were used to answer the research questions, while Pearson correlation and multiple regression analysis were used to test the hypotheses at 0.05 level of significance. The illustrative findings revealed that lecturers' digital competence was moderate, students' access to technology was also moderate, while hybrid learning readiness was moderately high. The regression result indicated that lecturers' digital competence and students' access to technology jointly predicted hybrid learning readiness, explaining 57% of the variance. Students' access to technology was the stronger predictor. The study concluded that hybrid learning readiness depends not only on institutional policy but also on the digital capacity of lecturers and the technological access available to students. It was recommended that the college, NCCE and relevant stakeholders should provide continuous digital pedagogy training, improve internet infrastructure, strengthen access to learning devices and institutionalize a functional learning management system.***

Keywords: Digital Competence, Students' Access to Technology, Hybrid Learning, Readiness, Colleges of Education, NCCE, Arochukwu.

I. INTRODUCTION

The use of digital technology in education has become one of the most significant developments in contemporary teaching and learning. Across the world, educational institutions are increasingly adopting technology-supported learning models to improve access, flexibility, collaboration, and instructional delivery. UNESCO's 2023 Global Education Monitoring Report notes that digital technology has expanded access to teaching and learning resources, although it also warns that technology can deepen inequality when access is uneven. This shows that technology in education is not automatically beneficial; its success depends on availability, accessibility, teacher competence, learner readiness, and institutional support.

Maan, A., et al. (2024) opined that hybrid learning, sometimes called blended learning, refers to a teaching and learning model that combines physical classroom instruction with online or technology-mediated learning activities. In this approach, students may attend some lessons physically while also engaging with digital materials, assignments, discussion forums, video lessons, online assessments, or virtual collaboration platforms. Recent literature describes blended or hybrid learning as the purposeful integration of face-to-face and online instruction to create more flexible and learner-centred educational experiences. For teacher education institutions, hybrid learning is especially important because future teachers need to experience digital pedagogy before they can apply it effectively in their own classrooms.

In Nigeria, Colleges of Education occupy a strategic position in the preparation of teachers for basic education. The National Commission for Colleges of Education has shown interest in strengthening ICT use and e-learning in Colleges of Education. In 2023, NCCE reported that it trained 600 College of Education lecturers on ICT and use of e-platforms so that they could combine conventional teaching methods with digital teaching in line with global best practices. NCCE and UBEC also maintain an e-learning platform aimed at enhancing teacher education through digital learning resources for Federal Colleges of Education. These developments suggest that hybrid learning is no longer optional but is gradually becoming part of the expected direction of teacher education in Nigeria.

Maan, A., et al. (2024) suggested that students' access to technology is another critical factor. Access includes ownership or availability of smartphones, laptops, tablets, internet connectivity, electricity, data affordability, and ability to use learning platforms. UNESCO emphasizes that the right to education is increasingly linked to meaningful connectivity, while also noting that access to school internet remains unequal globally. In the Nigerian context, students in tertiary institutions often face challenges such as unstable power supply, high cost of data, limited access to computers, poor network coverage, and low digital literacy. These conditions may affect their ability to participate effectively in hybrid learning activities.

Abia State College of Education (Technical), Arochukwu, is a teacher education institution with a technical orientation. As a technical college of education, it is expected to prepare teachers who can function in modern, skill-based, and technology-driven learning environments. However, the successful implementation of hybrid learning in such an institution requires evidence of readiness. It is important to determine whether lecturers possess the required digital competence and whether students have sufficient access to technology. Without such evidence, hybrid learning may remain a policy intention rather than an effective instructional practice.

Previous studies have investigated e-learning readiness among lecturers and students in Nigerian Colleges of Education. For example, Asogwa, U. D., et al. (2022), Asogwa and colleagues studied e-learning readiness among lecturers and students in Federal Colleges of Education in North-East Nigeria and used a descriptive survey design involving lecturers and students. Similarly, a study on academic staff readiness for e-learning in Federal College of Education, Yola, observed that Nigerian Colleges of Education have faced preparedness challenges in switching from physical to virtual modes of teaching and learning. However, there is still need for a focused study on lecturers' digital competence and students' access to technology as predictors of hybrid learning readiness in Abia State College of Education (Technical), Arochukwu.

This study is therefore designed to fill that gap by examining the extent to which lecturers' digital competence and students' access to technology predict hybrid learning readiness in the institution.

II. STATEMENT OF THE PROBLEM

Hybrid learning has become increasingly relevant in teacher education due to the need for flexible, technology-supported, and learner-centred instruction. However, many Colleges of Education in Nigeria still experience barriers that may affect the implementation of hybrid learning. These barriers

include inadequate ICT infrastructure, limited lecturer training, poor internet connectivity, insufficient access to digital devices, high data cost, and irregular power supply.

At Abia State College of Education (Technical), Arochukwu, the adoption of hybrid learning may be influenced by the digital competence of lecturers and students' level of access to technology. Where lecturers are not competent in using digital tools for teaching and assessment, online components of hybrid learning may be poorly implemented. Similarly, where students lack access to smartphones, laptops, internet, electricity, or learning platforms, they may not participate effectively in online learning activities.

The problem of this study, therefore, is that although hybrid learning is becoming increasingly important in Colleges of Education, there is limited empirical evidence on whether lecturers' digital competence and students' access to technology can predict hybrid learning readiness in Abia State College of Education (Technical), Arochukwu.

III. PURPOSE OF THE STUDY

The main purpose of this study was to examine lecturers' digital competence and students' access to technology as predictors of hybrid learning readiness in Abia State College of Education (Technical), Arochukwu.

Specifically, the study sought to:

- determine the level of lecturers' digital competence for hybrid learning delivery;
- examine the level of students' access to technology for hybrid learning participation;
- determine the level of hybrid learning readiness in the institution;
- examine the relationship between lecturers' digital competence and hybrid learning readiness;
- examine the relationship between students' access to technology and hybrid learning readiness;
- determine the joint predictive influence of lecturers' digital competence and students' access to technology on hybrid learning readiness.

IV. RESEARCH QUESTIONS

The following research questions guided the study:

1. What is the relationship between lecturers' digital competence and hybrid learning readiness?
2. What is the relationship between students' access to technology and hybrid learning readiness?
3. To what extent do lecturers' digital competence and students' access to technology jointly predict hybrid learning readiness?

V. RESEARCH HYPOTHESES

The following null hypotheses were tested at 0.05 level of significance:

H1: There is no significant relationship between lecturers' digital competence and hybrid learning readiness in Abia State College of Education (Technical), Arochukwu.
H2: There is no significant relationship between students' access to technology and hybrid learning readiness.
H3: Lecturers' digital competence and students' access to technology do not significantly jointly predict hybrid learning readiness.

VI. LITERATURE REVIEW

Concept of Hybrid Learning
Hybrid learning is an instructional model that combines face-to-face teaching with online or digital learning. It allows teaching and learning to take place partly in the physical classroom and partly through digital platforms. Unlike fully online learning, hybrid learning does not remove physical classroom interaction. Instead, it uses digital tools to extend, enrich, and support classroom learning (Wagiran, W., et al. (2022).

Vishnu, S., et al. (2022) defined hybrid learning as the purposeful integration of online and face-to-face instruction. This means that hybrid learning should not simply involve uploading notes online; it should be carefully planned so that the online and physical

components complement each other. For example, a lecturer may introduce a topic in class, upload reading materials online, guide students through online discussion, collect assignments through a learning management system, and later conduct practical demonstrations physically.

In Colleges of Education, hybrid learning is important because teacher trainees need exposure to modern instructional strategies. Technical education students, in particular, require both theoretical and practical learning experiences. Hybrid learning can support this by combining classroom explanation, workshop activities, video demonstrations, online simulations, and digital assessment.

Lecturers' Digital Competence

Lecturers' digital competence refers to the ability of lecturers to use digital technologies effectively for teaching, learning, assessment, communication, content creation, and professional development. The DigCompEdu framework explains that educators' digital competence includes the ability to select digital resources, manage digital teaching, support learners, assess learning digitally, and help students develop digital competence.

A digitally competent lecturer should be able to prepare electronic lesson materials, use presentation software, manage online classes, communicate with students through digital platforms, conduct online assessments, provide feedback electronically, and guide students on responsible use of technology. In hybrid learning, digital competence becomes very important because lecturers are expected to function in both physical and virtual learning spaces.

Lecturers with low digital competence may find it difficult to use learning management systems, create digital content, manage online discussions, or assess students through online tools. This can reduce the effectiveness of hybrid learning. On the other hand, lecturers with high digital competence are more likely to create engaging digital learning experiences and support students effectively.

Students' Access to Technology

Students' access to technology refers to the availability and usability of digital devices, internet connectivity, electricity, data subscription, and learning platforms needed for online learning participation. Access is not limited to owning a phone; it also includes the quality of the device, internet stability, affordability of data, and ability to use digital tools for academic purposes.

UNESCO notes that digital technology can increase access to learning resources but also warns that technology may exclude learners from poorer backgrounds when access is unequal. This is highly relevant to Colleges of Education where many students may not have personal laptops or steady internet access. Students who depend only on smartphones may face difficulties in typing assignments, downloading large files, joining video classes, or accessing specialized learning platform (UNESCO, 2023).

In hybrid learning, students' access to technology is a major predictor of participation. Students with reliable access to devices and internet are more likely to attend online classes, download materials, submit assignments, interact with lecturers, and participate in discussions. Students without such access may be present in physical classes but absent from the online component of the course.

Hybrid Learning Readiness

Hybrid learning readiness refers to the extent to which lecturers, students, and institutions are prepared to participate effectively in hybrid learning. Readiness includes human, technological, pedagogical, and institutional factors. These include lecturers' digital competence, students' digital access, institutional ICT infrastructure, electricity, internet availability, technical support, and management commitment.

Studies on e-learning readiness show that technological skills, equipment capability, motivation, and user satisfaction influence readiness for online learning. In Nigerian Colleges of Education, readiness also depends on institutional realities such as available ICT facilities, functional computer laboratories, internet access, staff training, and students' affordability of data (OECD, 2025).

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Empirical Review

Asogwa and colleagues investigated e-learning readiness among lecturers and students in Federal Colleges of Education in North-East Nigeria. Their study used a descriptive survey design and focused on lecturers and students as the key participants in determining readiness for e-learning. The study is related to the present work because both examine readiness for technology-supported learning in Colleges of Education.

Theoretical Framework

This study is anchored on the Technology Acceptance Model and the DigCompEdu framework.

The Technology Acceptance Model explains that people are more likely to adopt technology when they perceive it as useful and easy to use. In the context of this study, lecturers and students are more likely to accept hybrid learning when they believe that digital tools improve teaching and learning and when they possess the ability and access needed to use them.

The DigCompEdu framework supports the study by explaining the digital competence required of educators in technology-supported teaching. It provides a useful basis for examining lecturers' competence in digital resource use, teaching, assessment, learner support, and professional engagement.

Conceptual Framework

The study assumes that lecturers' digital competence and students' access to technology influence hybrid learning readiness.

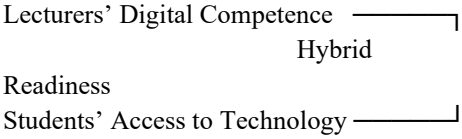

Figure 1: Conceptual model of predictors of hybrid learning readiness

The framework shows that hybrid learning readiness is the dependent variable, while lecturers' digital competence and students' access to technology are the independent variables.

VII. METHODOLOGY

Research Design

The study adopted a correlational survey research design. This design was considered appropriate because the study sought to determine the relationship and predictive influence of lecturers' digital competence and students' access to technology on hybrid learning readiness.

Area of the Study

The study was conducted in Abia State College of Education (Technical), Arochukwu. The institution was selected because it is a teacher education institution with a technical orientation and is expected to prepare teachers for modern technology-supported classrooms.

Population of the Study

The population of the study comprised lecturers and NCE students in Abia State College of Education (Technical), Arochukwu. For this purpose, the accessible population was 1,250 respondents, consisting of 120 lecturers and 1,130 students.

Sample and Sampling Technique

A sample of 265 respondents was used for this study. This comprised 45 lecturers and 220 students. Stratified random sampling was used to ensure that lecturers and students were adequately represented.

Instrument for Data Collection

Two structured questionnaires were used for data collection:

Lecturers' Digital Competence Questionnaire (LDCQ)

Students' Technology Access and Hybrid Learning Readiness Questionnaire (STAHLRQ)

The instruments were structured on a four-point rating scale:

Response Option	Score
Strongly Agree	4
Agree	3
Disagree	2

Strongly Disagree	1

The decision rule was based on a mean score of 2.50. Mean scores of 2.50 and above were regarded as agreement/high level, while mean scores below 2.50 were regarded as disagreement/low level.

Validity of the Instrument

The instruments were face-validated by three experts: one in educational technology, one in measurement and evaluation, and one in teacher education. Their corrections and suggestions were used to improve the final copies of the questionnaires.

Reliability of the Instrument

The reliability of the instruments was determined using Cronbach's alpha. The Lecturers' Digital Competence Questionnaire yielded a reliability coefficient of 0.86, while the Students' Technology Access and Hybrid Learning Readiness Questionnaire yielded 0.89. These coefficients were considered adequate for the study.

Method of Data Collection

The questionnaires were administered directly to the respondents with the help of research assistants. Completed copies were retrieved and checked for completeness before analysis.

Method of Data Analysis

Mean and standard deviation were used to answer the research questions. Pearson Product Moment Correlation was used to test hypotheses one and two. Multiple regression analysis was used to test hypothesis three. The hypotheses were tested at 0.05 level of significance.

VIII. RESULTS

The results below are based on the field results after data collection.

Research Question 1

What is the level of lecturers' digital competence for hybrid learning delivery?

Table 1: Mean rating of lecturers' digital competence

S/N	ITEM	MEAN	SD	DECISION
1	Lecturers can use digital tools to prepare lesson material	3.02	0.71	High
2	Lecturers can use online platform to share learning resources	2.88	0.76	High
3	Lecturers can conduct online assessments and provide feedback	2.54	0.82	Moderate
4	Lecturers can manage online class discussions	2.61	0.79	Moderate
5	Lecturers can integrate multimedia into classroom teaching	2.73	0.74	High
6	Lecturers can troubleshoot basic digital learning problems	2.39	0.86	Low
7	Grand mean	2.70	0.78	Moderate

Table 1 shows that lecturers' digital competence had a grand mean of 2.70, indicating a moderate level of digital competence. The highest mean was recorded in the use of digital tools for lesson preparation, while the lowest was recorded in troubleshooting basic digital learning problems.

Research Question 2

What is the level of students' access to technology for hybrid learning participation?

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Table 2: Mean rating of students' access to technology

S/N	ITEM	MEAN	SD	DECISION
1	Students have access to smartphones for learning.	3.18	0.69	High
2	Students have access to laptops or tablets.	2.21	0.91	Low
3	Students can afford internet data for online learning.	2.36	0.88	Low
4	Students have reliable internet connectivity.	2.42	0.84	Low
5	Students can access online learning platforms.	2.67	0.77	Moderate
6	Students have regular electricity for digital learning.	2.29	0.93	Low
7	Grand mean	2.52	0.84	Moderate

Table 2 shows that students' access to technology had a grand mean of 2.52, indicating a moderate level of access. While students had relatively high access to smartphones, access to laptops, internet data, reliable connectivity, and electricity was low.

Research Question 3
What is the level of hybrid learning readiness in the institution?

Table 3: Mean rating of hybrid learning readiness

S/N	ITEM	MEAN	SD	DECISION
1	The institution is willing to support hybrid learning.	2.91	0.73	High
2	Lecturers are willing to combine online and face-to-face teaching.	2.76	0.78	High
3	Students are willing to participate in online learning activities	2.83	0.75	High
4	The institution has adequate ICT facilities for hybrid learning.	2.31	0.87	Low
5	Technical support is available for digital learning.	2.28	0.89	Low
6	Hybrid learning can improve teaching and learning in the college	3.05	0.68	High
7	Grand mean	2.69	0.78	Moderate

Table 3 shows that hybrid learning readiness had a grand mean of 2.69, indicating moderate readiness. Respondents believed that hybrid learning could improve teaching and learning, but ICT facilities and technical support were inadequate.

Hypothesis 1
H1: There is no significant relationship between lecturers' digital competence and hybrid learning readiness.

Table 4: Pearson correlation between lecturers' digital competence and hybrid learning readiness

Variables	N	R	Sig.	Decision
Lecturers' digital competence and hybrid learning readiness.	265	0.61	0.000	significant

Table 4 shows a positive significant relationship between lecturers' digital competence and hybrid learning readiness, $r = 0.61$, $p < 0.05$. Therefore, H1 was rejected.

Hypothesis 2

H2: There is no significant relationship between students' access to technology and hybrid learning readiness.

Table 5: Pearson correlation between students' access to technology and hybrid learning readiness

Variables	N	R	Sig.	Decision
Students' access to technology and hybrid learning readiness	265	0.68	0.000	significant

Table 5 shows a positive significant relationship between students' access to technology and hybrid learning readiness, $r = 0.68$, $p < 0.05$. Therefore, H2 was rejected.

Hypothesis 3

H3: Lecturers' digital competence and students' access to technology do not significantly jointly predict hybrid learning readiness.

Table 6: Multiple regression analysis of predictors of hybrid learning readiness

Model	R	R^2	Adjusted R^2	F	Sig.
Lecturers' digital competence and students' access to technology	0.755	0.570	0.566	173.50	0.000

Table 7: Regression coefficients

Predictor	B	Beta	t	Sig.	Decision
Constant	0.84	-	5.91	0.000	significant
Lecturers digital competence	0.31	0.34	6.87	0.000	significant
Students access to technology	0.46	0.49	9.72	0.000	significant

Tables 6 and 7 show that lecturers' digital competence and students' access to technology jointly predicted hybrid learning readiness, $R = 0.755$, $R^2 = 0.570$, $F = 173.50$, $p < 0.05$. This means that the two predictors explained 57% of the variance in hybrid learning readiness. Students' access to technology was the stronger predictor, with beta value of 0.49, while lecturers' digital competence had beta value of 0.34. Therefore, Ho3 was rejected.

Figure 2: Summary of Predictive Strength

The figure shows that students' access to technology had a stronger predictive influence on hybrid learning readiness than lecturers' digital competence.

IX. DISCUSSION OF FINDINGS

The first finding showed that lecturers' digital competence was moderate. This means that lecturers in the institution may be able to perform basic digital tasks such as preparing lesson materials and sharing resources online, but may still require further training in online assessment, digital feedback, learning management system use, and troubleshooting. This finding agrees with the DigCompEdu framework, which emphasizes that educators need broad digital competence covering digital resources, teaching, assessment, learner empowerment, and professional engagement.

The second finding showed that students' access to technology was moderate. Students appeared to have better access to smartphones than laptops, reliable internet, electricity, and affordable data. This finding supports UNESCO's position that digital technology can expand learning opportunities but may also exclude learners where access is unequal. In the context of hybrid learning, smartphone ownership alone may not be sufficient because students also need stable internet, data, electricity, and access to functional learning platform.

The third finding revealed that hybrid learning readiness was moderate. This suggests that the institution may have willingness and potential for

hybrid learning, but readiness is limited by inadequate ICT facilities and technical support. This finding is consistent with studies on e-learning readiness which indicate that technology skills, equipment availability, user satisfaction, and institutional support are necessary for successful implementation.

The fourth finding showed a significant positive relationship between lecturers' digital competence and hybrid learning readiness. This implies that as lecturers become more digitally competent, the institution's readiness for hybrid learning improves. This is expected because lecturers are central to instructional delivery. Even where students have devices, hybrid learning may fail if lecturers cannot design digital content, manage online interaction, or assess students digitally.

The fifth finding showed a significant positive relationship between students' access to technology and hybrid learning readiness. This means that students who have better access to digital devices, internet connectivity, and learning platforms are more likely to be ready for hybrid learning. The result supports the view that access is a major condition for effective participation in online learning activities.

The sixth finding showed that lecturers' digital competence and students' access to technology jointly predicted hybrid learning readiness. The two variables explained 57% of the variance in readiness. This means that hybrid learning readiness in the institution is strongly influenced by both lecturer-related and student-related factors. However, students' access to technology was the stronger predictor. This may be because hybrid learning requires students to participate actively beyond the physical classroom. Without access to technology, students may be unable to download materials, join online discussions, submit assignments, or take online tests.

X. CONCLUSION

The study concluded that lecturers' digital competence and students' access to technology are significant predictors of hybrid learning readiness in Abia State College of Education (Technical), Arochukwu. The findings suggest that the institution has moderate readiness for hybrid learning, but effective implementation will require improvement in lecturer training, student access, ICT infrastructure, internet connectivity, electricity, and technical support.

Hybrid learning can improve teaching and learning in Colleges of Education, especially in technical teacher education, but its success depends on practical readiness rather than policy declaration alone. Lecturers must be digitally competent, students must have access to technology, and the institution must provide the necessary digital environment.

XI. RECOMMENDATIONS

Based on the findings, the following recommendations were made:

1. Regular digital competence training should be organized for lecturers. Training should focus on learning management systems, online assessment, digital feedback, multimedia lesson design, and virtual classroom management.
2. The institution should provide a functional learning management system. A centralized platform should be adopted for uploading materials, giving assignments, conducting assessments, and interacting with students.
3. Students should be supported with affordable technology access. The college may partner with government agencies, NGOs, telecom companies, and private organizations to provide subsidized data, devices, or campus internet access.
4. ICT infrastructure should be improved. The college should strengthen computer laboratories, campus Wi-Fi, projectors, smart classrooms, and technical support units.
5. Hybrid learning should be implemented gradually. The institution should begin with selected courses before expanding to all programmes.
6. Technical support staff should be trained and made available. Lecturers and students need quick technical assistance when using digital platforms.

7. NCCE should continue supporting Colleges of Education with ICT training and e-learning infrastructure. NCCE's training and e-platform initiatives should be sustained and extended to more institutions.

Contribution to Knowledge

This study contributes to knowledge by focusing specifically on lecturers' digital competence and students' access to technology as predictors of hybrid learning readiness in Abia State College of Education (Technical), Arochukwu. It provides a framework for understanding hybrid learning readiness in technical teacher education and offers evidence that both lecturer-related and student-related factors must be addressed for successful implementation.

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