PERCEPTIONS OF READINESS OF ONLINE LEARNING AMONG HEADS AND LECTURERS OF MATHEMATICS DEPARTMENTS IN KEBBI STATE INSTITUTIONS OF HIGHER LEARNING

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Abstract

Nigeria is said to have one of the highest numbers of out-of-school children. The adoption of technological innovations is perceived as a possible solution to an accelerated education programme. Higher education in Nigeria has been impacted by the COVID-19 pandemic's extensive spread and the swift digital transition. Countries worldwide have resorted to online teaching and learning in an effort to guarantee continuous educational delivery and lessen the effect of the COVID-19 epidemic on education. This clearly shows the potential of online learning towards ensuring inclusive and equitable quality education. But because of this sudden change, this study uses a descriptive survey approach to investigate how staff and students of mathematics view and prepare for online learning. A sample size of 101 mathematics lecturers and 7 heads of department (HODs) from all of Kebbi State's public higher education institutions participated in the study. For data collection, two sets of self-developed 4-point Likert scale questionnaires were used. The questionnaires were validated by experts, and Cronbach's alpha coefficient showed a reliability coefficient of 0.80. To ascertain the degree of preparedness for online learning of mathematics HODs and lecturers, the data collected in this study were analysed using percentages, descriptive statistics of mean, and standard deviation. According to the study's overall findings, mathematics lecturers believe they have the technical skills necessary to contextualise their pedagogical knowledge to online teaching and learning, while HODs are highly prepared for this type of instruction. In order to safeguard the quality of online teaching and learning implementation, it was recommended that strategic planning be necessary to ensure that the lecturers' and HODs' weak points in terms of their online readiness for installing, maintaining, and enhancing ICT infrastructures are unquestionably addressed.

Keywords: Online learning readiness, HODs, mathematics lecturers, institutions of higher learning

Introduction

Online learning is a type of learning that has become a major part of the teaching process in recent years, situated within a computer-mediated environment comprising of a set of group communication workspaces and facilities that are constructed in software (Effiong et al., 2016). By extending the boundaries of their classrooms and reducing in-person instruction, the internet's exponential growth has created new opportunities for higher education to break down barriers, reach a wider and more diverse audience, and create new markets in geographically remote areas (Abdurrahman et al., 2024; Effiong et al., 2016). According to Bello et al. (2023), higher education institutions are aware that utilising technology in the classroom may create, grow, disseminate, and stimulate learning as well as improve students' comprehension and knowledge. Students can simulate being in a real-life situation when they are unlikely to be in the same room with others by using real-time audio or video chat and screen sharing (Jacqueline, 2019; Muhammad & Abubakar, 2019). Thomas and Muhammad (2020) posit that a paperless classroom helps students build a variety of digital skills that will eventually aid in the development of real-life skills, including self-learning and teamwork. Additionally, this type of learning exercise will turn into a practical training ground for students to get ready for their future careers and lives. The rationale behind the adoption of online learning is that it offers significant flexibility in terms of teaching methods, content management, synchronous and asynchronous student-lecturer interaction,

and course organisation and structure. Moreover, it offers distance learning that can establish new learning environments to attain a successful academic program and gives students the means to communicate with instructors and peers both within and outside of the classroom (Abdurrahman et al., 2024; Oanh et al., 2023).

Bello et al. (2024); Galecia et al. (2022) claim that the COVID-19 pandemic has increased online learning opportunities globally, as the majority of countries nowadays have blended online learning methods in their educational institutions as a result of this epidemic. Mental and technical readiness for the online learning mode must be analysed so that relevant help may be offered to solve the ICT setup adaptability. Unquestionably, the problem that all nations face is that, although these technological solutions appear to be the best way to reduce significant learning losses during the crisis, they also run the risk of escalating educational equity disparities. As a result, if the digital divide in education were to widen as schools are closed during COVID-19, learning poverty and inequality would inevitably rise as well. Bana et al. (2022) outlined 3 steps for teaching and learning to be ensured and continue; "the first step is to make sure that all HODs and lecturers have access and would be able to use online learning tools and digital platforms with educational content. The second factor is the digital use gap (without guidance, HODs and lecturers would find it difficult to manipulate and use online content), even in rich countries where everyone has access to the internet, but not everyone does. The third dimension is the digital school gap, which is the ability and capacity of each institution to provide individualised, or appropriately levelled and sequenced, digital teaching for HODs and lecturers, to promote and track engagement with these materials, and to give feedback that helps maximise teaching and learning outcomes". A lecturer may, for example, only use printed materials or recommend that students watch lesson-specific videos, while another lecturer may continue to hold classes online or find innovative ways to use digital apps for both one-on-one and group student interaction. Muhammad et al. (2024) assert that electronic gadgets, an efficient library system, and online resources that are easily accessible from anywhere in the world are essential components of online learning. Since learning is typically conducted in-person in the majority of developing nations, adjusting to online learning will necessitate certain behavioural adjustments as well as legislative guidelines to make it feasible for students, lecturers, and HODs.

Despite the attempt made by Nigeria towards adopting the United Nations Sustainable Development Goal 4 of ensuring inclusive and equitable quality education, and also promoting lifelong learning opportunities for all of the 2030 agenda. According to UNICEF (2022), about 12.4 million children never attended school, and 5.9 million left school early in Nigeria, making one in every five of the world's out-of-school children (OOSC) in Nigeria, and one in every 3 children is out of school. The use of innovation and digital technology was part of the solution towards overcoming the problem. Accelerated Education Programme is one of the key possible interventions for addressing OOSC globally, which requires the use of digital technology and innovations to address this global problem (Oyekan et al., 2023).

It becomes more important for stakeholders to be sufficiently knowledgeable and skilled in using the online learning platform. As a result, an effective online learning environment requires a strong support network, and for this kind of assistance to be long-lasting, both lecturers and students need to have easy access to and knowledge of electronic and internet devices, as well as the necessary navigational abilities. They also need to adjust to the new learning environment and culture, and consequently, how they perceive online learning materials may influence their acceptability and usage, which could result in beneficial new teaching and learning strategies. A positive step is the readiness of lecturers and HODs to adjust to changes and embrace online learning as a new method of teaching. It is a crucial component of online teaching and learning, which involves self-assurance when utilising technology and the capacity to engage in self-directed learning. Therefore, it might be interpreted as the degree to which online learning will be successful or well-accepted. However, Nganga, Waruru, and Nakweya (2020) found that different institutions have different levels of preparedness for online learning because some lecturers and students lack the funds to purchase internet bundles as well as the laptops necessary to participate in online learning. However, according to Dube (2020) and Muhammad et al. (2024), lecturers' attitudes and preparedness for online learning are hindered by a number of issues, such as network unavailability, lack of online learning devices, lack of computer skills, and the high cost of internet data bundles.

It is common knowledge that the availability of functional ICT facilities, technical know-how (skills), lecturers, and students' preparedness are all necessary for online learning. Despite the growing relevance of online learning as a viable model for ensuring inclusive and equitable quality education (Abdurrahman et al., 2024; Tamrat & Teferra, 2020), studies have shown that institutions, particularly in low and middle-income contexts, continue to experience serious challenges relating to inadequate infrastructure, conflicting attitudes and limited readiness for online instruction (Muhammad et al., 2024). The shift from face-to-face pedagogy to digital delivery requires lecturers to competently engage students using online platforms, deploy multimedia resources, and assess learning virtually, which in turn demands consistent in-service training and strong institutional support (Pham & Van-Nghiem, 2022). However, lack of technological know-how, insufficient digital facilities, high cost of internet access, and weak pedagogical preparedness have continued to hinder both lecturers' online teaching practices and students' engagement and participation (Abbasi et al., 2020; Aslam et al., 2023). Therefore, although online learning presents huge promise as a sustainable teaching modality, persistent readiness gaps pose a major barrier to its effective acceptance, utilisation and impact, especially within developing contexts. In light of this, the purpose of this study is to ascertain the perceptions of readiness of online learning among heads and lecturers of mathematics departments in Kebbi state institutions of higher learning. In specific terms, this study aimed to:

1. Determine the level of readiness for online learning of heads of mathematics departments (HODs) in Kebbi state institutions of higher learning.
2. Assess how ready mathematics lecturers are towards using online learning in Kebbi state institutions of higher learning.

To achieve these specific objectives, we raised and addressed the following research questions:

RQ1: What is the level of readiness of online learning of heads of mathematics departments (HODs) in Kebbi state institutions of higher learning?

RQ2: How ready are mathematics lecturers towards using online learning in Kebbi State institutions of higher learning?

Research Design

In this study, a descriptive survey design was employed. According to Sani (2017), survey design is a helpful scientific technique to employ when investigating respondents' perceptions and opinions as well as the relationship between them.

Participants

As indicated in Table 1, the samples used for the study include all 7 heads of departments (HODs) and 101 mathematics lecturers from Kebbi state institutions of higher learning.

Table 1: Population and samples selected for the study

S/N	Institution	LGA	HOD	Lecturers
1	Adamu Augie College of Education	Argungu	1	11
2	College of Basic and Advanced Studies	Yauri	1	5
3	Federal University of Agriculture	Zuru	1	12
4	Federal University Birnin Kebbi	Kalgo	1	23
5	Kebbi State Polytechnic	Dakingari	1	9
6	Kebbi State University of Science and Technology	Aleiro	1	25
7	WaziriUmaru Federal Polytechnic	BirninKebbi	1	16
	Total		**7**	**101**

Instrumentation

The researchers employed a 4-point Likert scale with 7 dimensions for heads of departments (HODs) and 11 dimensions for mathematics lecturers to ascertain the perceptions of readiness of online learning among these

individuals."Each dimension has indicators that measure the readiness of both HODs and mathematics lecturers for online learning and all items (with few exceptions) are rated using the following options: 4-always; 3-sometimes; 2-not often; and 1-never". The few exceptions are: "availability of ICT gadgets" rated as: "4-personally owned; 3-provided by the school; 2-borrowed; and 1-does not own"; and "status of ICT infrastructure in schools" rated as "4-excellent; 3-very good; 2-good; and 1-poor". The questionnaires were validated by experts, and amendments were made, and a reliability coefficient of 0.80 was achieved using Cronbach's alpha.

Data Collection and Analysis

The data obtained in this study were examined using percentages, descriptive statistics of mean, and standard deviation (using SPSS) in order to ascertain the degree of preparedness for online learning of mathematics HODs and lecturers. The mean was translated into a numerical scale with a corresponding verbal description as outlined by Bana et al. (2022): "very ready (4.00-3.26), ready (3.25-2.51), fairly ready (2.50-1.76), not ready (1.75-1.00)".

Results

RQ 1: What is the level of readiness of online learning of heads of mathematics departments (HODs) in Kebbi state institutions of higher learning?

Table 2: Level of readiness for online learning of HODs

Indicators of online learning	Always/ Personally owned	Sometimes/ Provided by the school	Not-often/ Borrowed	Never/ Does not own	N	Mean	SD	Description
Demonstrate knowledge of digital technology skills	4 (57.1%)	2 (28.6%)	1 (14.3%)	0 (0%)	7 (100%)	3.43	0.43	Very ready
Availability and accessibility of ICT gadgets	6 (85.7%)	1 (14.3%)	0 (0%)	0 (0%)	7 (100%)	3.86	0.24	Very ready
Organise, implement and manage online learning	3 (42.9%)	3 (42.9%)	1 (14.3%)	0 (0%)	7 (100%)	3.26	0.46	Very ready
Proficient in utilising tools to maximise productivity	2 (28.6%)	4 (57.1%)	0 (0%)	1 (14.3%)	7 (100%)	3.00	0.49	Ready
Can employ Google Meet or Zoom to create online presentations	7 (100%)	0 (0%)	0 (0%)	0 (0%)	7 (100%)	4.00	0.42	Very ready
Can be able to resolve fundamental internet problems related to online learning	2 (28.6%)	2 (28.6%)	1 (14.3%)	2 (28.6%)	7 (100%)	2.57	0.21	Fairly ready
Can purchase data to access the internet when there isn't a free school internet connection	5 (71.4%)	2 (28.6%)	0 (0%)	0 (0%)	7 (100%)	3.71	0.40	Very ready
Overall mean						**3.41**	**0.41**	**Very ready**

Very ready (4.00-3.26), ready (3.25-2.51), fairly ready (2.50-1.76), not ready (1.75-1.00)

The findings of Table 2 indicate that, with mean scores of 3.43 and SD=0.43 for item 1 i.e. demonstrate knowledge of digital technology skills, the HODs are "very ready", whereas item 2 mean score of 2.86 and SD=0.24 for availability and accessibility of ICT gadgets to be used for the implementation of online learning also indicates that the HODs are "very ready". Item 3 indicated a mean score of 3.26 and SD=0.46; these results also demonstrate that the HODs are "very ready" to organise, implement and manage online learning in their departments. Furthermore, item 4 showed that HODs are "ready" when it comes to proficiency in utilising tools to maximise productivity, with a mean score of 3.00 and SD=0.49. Item 5 showed that HODs are "very ready" when it comes to employing Google Meet or Zoom to create online presentations, with a mean score of 4.00 and SD=0.42. With a mean score of 2.57 and SD=0.21 for item 6, the HODs are "fairly ready" to be able to resolve fundamental internet problems related to online learning, whereas item 7 showed a mean score of 3.71 and SD=0.40, indicating that HODs are "very ready" to purchase data to access the internet when there isn't a free school internet connection. To put it briefly, the HODs' overall mean score of 3.41 and SD=0.41 for all online

learning domains combined with their degree of preparation suggested that they are “very ready” for online learning.

RQ2: How ready are mathematics lecturers towards using online learning in Kebbi state institutions of higher learning?

Table 3: Level of readiness for mathematics lecturers towards using online learning

Indicators of online learning	Always/ Excellent	Some-times/ Very good	Not-often/ Good	Never/ Poor	N	Mean	SD	Description
Demonstrate knowledge of digital technology skills	63 (62.4%)	21 (20.8%)	17 (16.8%)	0 (0%)	101 (100%)	3.46	0.44	Very ready
Readiness to use online learning for providing delivery of lessons	58 (57.4%)	19 (18.8%)	11 (10.9%)	13 (12.9%)	101 (100%)	3.21	0.41	Ready
Task-oriented competencies for online instruction	31 (30.7%)	25 (24.8%)	38 (37.7%)	7 (6.9%)	101 (100%)	2.79	0.35	Ready
Availability and accessibility of ICT gadgets	65 (64.4%)	22 (21.8%)	14 (13.9%)	0 (0%)	101 (100%)	3.51	0.46	Very ready
The state of the department's ICT infrastructure	37 (36.6%)	30 (29.7%)	21 (20.8%)	13 (12.9%)	101 (100%)	2.90	0.37	Ready
I can access the internet whenever I want using a computer, iPhone, tablet, or smartphone	64 (63.4%)	14 (13.9%)	23 (22.8%)	0 (0%)	101 (100%)	3.41	0.43	Very ready
Can access a dependable internet connection at home and at school whenever I want	14 (13.9%)	11 (10.9%)	64 (63.4%)	12 (11.9%)	101 (100%)	2.27	0.32	Fairly ready
Can purchase data to access the internet when there isn’t a free school internet connection	38 (37.6%)	53 (52.5%)	10 (9.9%)	0 (0%)	101 (100%)	3.28	0.42	Very ready
Can also use any type of online money transfer to purchase an important document	26 (25.7%)	21 (20.8%)	43 (42.6%)	11 (10.9%)	101 (100%)	2.61	0.34	Fairly ready
Can be able to create instructional presentations using PowerPoint and Keynote	47 (46.5%)	30 (29.7%)	11 (10.9%)	13 (12.9%)	101 (100%)	3.10	0.40	Ready
Can be able to record screens for purposes of academic learning	32 (31.7%)	27 (26.7%)	30 (29.7%)	12 (11.9%)	101 (100%)	2.78	0.34	Ready
	Overall mean					**3.03**	**0.41**	**Ready**

Very ready (4.00-3.26), ready (3.25-2.51), fairly ready (2.50-1.76), not ready (1.75-1.00)

Item 1 and Item 2 of Table 3 indicate that mathematics lecturers are “very ready” and “ready” in terms of their knowledge of digital technology skills and their readiness to use online learning for providing delivery of lessons, with mean scores of 3.46 and SD=0.44 and 3.21 and SD=0.41, respectively. Additionally, item 3 results indicate that lecturers are “ready” for task-oriented competencies for online instruction with a mean score of 2.79 and SD=0.35. Additionally, items 4 and 5 indicate that ICT gadgets are available and accessible, as well as that the state of the department’s ICT infrastructure is in place, showing “very ready” and “ready”, respectively, with mean scores of 3.51 and SD=0.46 and 2.90 and SD=0.37. The lecturers are “very ready” and “fairly ready” for accessibility and dependable internet connection at home and at school via their computer, iPhone, tablet, or smartphone, according to the mean scores for items 6 and 7, which were 3.41 and SD=0.43 and 2.27 and SD=0.32, respectively. In the absence of a free school internet connection, lecturers are “very ready” and “fairly ready” to purchase data or online documents, according to mean scores of 3.28 and SD=0.42 and 2.61 and SD=0.34 on items 8 and item 9, respectively. Mathematics lecturers are “ready” to use PowerPoint and Keynote to create instructional presentations as well as record their screens for academic purposes from the findings of items 10 and 11, with mean scores of 3.10 and SD=0.40 and 2.78 and SD=0.34, respectively. The overall mean of 3.03 and SD=0.41 in Table 3 imply that mathematics lecturers are generally “ready” for online learning. According to the overall results, lecturers feel that they have the digital technological skills necessary for online learning, which puts them in a relatively prepared position to apply their pedagogical knowledge to online instruction.

Discussions

According to the overall results, mathematics lecturers and heads of departments (HODs) perceive that they are equipped with the digital technology skills necessary for online presentations, know how to implement and oversee online learning, know how to use productivity tools and troubleshoot basic internet connection issues, have access to ICT devices for their own use or those provided by their departments, and go above and beyond to purchase data to browse the internet when there isn't a free internet connection at school. The study's findings supported those of Chung, Subramaniam, and Dass (2020) and Olalekan, Hayatudeen, Kemi, and Jummai (2021) regarding lecturers' preparedness for using online learning platforms during the COVID-19 pandemic. Except for fear about unstable power supplies and internet connectivity during the delivery of online lessons, the vast majority of respondents expressed a high level of preparedness for online learning. Additionally, the study highlights the potential difficulties lecturers may have while implementing digital teaching and learning. It was evident that the complex nature of certain learning platforms hinders lecturers from using digital teaching and learning to contextualise their pedagogical skills. In accordance with the results, some lecturers struggle to create online presentations using Zoom or Google Meet, and they also have trouble resolving basic problems that are connected to learning via the internet. According to research by Kapasia et al. (2020) and Suryaman et al. (2020), almost all lecturers own a laptop, smartphone, PC, tablet, or iPhone, but they face numerous challenges, like a poor teaching and learning environment, a lack of technological proficiency, expensive internet services, and restricted internet accessibility.

Conclusion

The researchers came to the conclusion that mathematics lecturers and HODs were "very ready" for online learning based on the study's results. They are proficient with digital technology for online presentations, know how to set up and oversee online education, know how to use productivity tools and troubleshoot basic internet connection issues, and have access to ICT devices that they can use either personally or through departmental provision. Furthermore, it was found that lecturers and HODs were equally prepared in terms of the availability of ICT gadgets for online learning because they both had the same privilege of accessing the computers and laptops owned by the institution's centres for information technology (CIT). The results also indicated that lecturers of mathematics and their HODs believed they had the digital technical skills necessary to implement online teaching and learning. This means they are somewhat prepared to adapt their pedagogical skills to online teaching when delivering lessons, illustrating opportunities for the development of digital technology skills in the classroom. Their involvement in virtual presentations during the COVID-19 pandemic's lockdowns provided them with practical experience using the internet for online meetings and collaboration with other lecturers. It also made it easier for them to become familiar with educational technologies and helped them become more accustomed to the delivery of lessons online. The demand for ICT devices (such as smartphones, laptops, and tablets) has skyrocketed as a result of the adoption of online platforms for school operations and printing jobs for students' learning materials in the implementation of module-based learning delivery. These devices have also given lecturers access to ICT experiences, given that online learning is regarded as a substitute for traditional classroom instruction. Lecturers with prior experience and expertise demonstrated greater preparedness because no formal training program was put in place to assess all institutions' knowledge and proficiency in implementing online learning; in other words, the degree of preparedness for online learning varies depending on the degree of preparedness of the HODs and lecturers. It was recommended that the introduction of online learning must be conceptualised by HODs and lecturers in order to determine the degree of preparedness for online teaching and learning. And also to guarantee the quality of online teaching and learning implementation, strategic planning is necessary to ensure that the weak areas of HODs' and lecturers' online readiness (such as digital technology skills, availability of ICT gadgets) are addressed in installing, managing, and improving the state of ICT infrastructures.

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