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Utilizing Digital Tools for Enhancing Teaching and Learning of Science Education in University of Maiduguri, Borno State, Nigeria

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Abstract

This study examined the utilisation of digital tools for enhancing the teaching and learning of Science Education at the University of Maiduguri, Borno State, Nigeria. The research was guided by five research questions. A descriptive survey research design was adopted, involving a sample of 120 respondents comprising 20 Science Education lecturers, no sampling technique and 100 Undergraduate students' were randomised using simple random sampling drawn from Department of Science Education, University of Maiduguri. Data were collected using a closed-ended and open-ended structured questionnaire titled Digital Tool Structured Questionnaire which was face and content validated by experts and the reliability index of the instrument established was 0.87 using Cronbach Alpha and analysed using frequency counts and percentages. Findings revealed that digital tools such as Google classroom, you-tube, Moodle, zoom, and multimedia presentations are commonly used in Science Education instruction, while advanced resources like virtual laboratories and interactive simulations are less frequently adopted. The use of these tools were found to significantly enhance students' understanding of Science concepts, motivation to learners, knowledge retention, and overall academic performance; poor internet connectivity, insufficient digital training for lecturers, high cost of internet data, limited access to technological devices, and low digital literacy among students. The study concludes that digital tools play a vital role in improving Science Education by making learning more interactive, engaging, and effective. It recommends among others that the University of Maiduguri should invest in ICT infrastructure and organize regular training workshops for both lecturers and students and align digital tools with the Science Education curriculum.

Keywords: Digital Tools, Enhancing Teaching, Learning and Science Education

Introduction

In recent decades, the integration of digital technology into education has transformed traditional pedagogical models globally, making teaching and learning more interactive, efficient, and accessible. As education continues to evolve in the 21st century, digital tools such as virtual laboratories, e-learning platforms, online simulations, multimedia presentations, and educational software have become vital in improving both the delivery and assimilation of academic content, particularly in science subjects like biology (UNESCO, 2021). These tools provide an opportunity for educators to shift from teacher-centred instruction to student-centred learning, fostering deeper understanding through visual and interactive content (Eze & Eze, 2019). Science Education is a natural science concerned with the study of living organisms, their structure, function, growth, evolution, and interactions, is particularly dependent on visualisation and hands-on experience. Traditional teaching methods that rely primarily on textbooks and chalkboard explanations often fail to capture the dynamic and practical nature of biological processes, leading to disengagement and poor academic outcomes among students (Eze & Eze, 2019). In contrast, digital tools provide diverse modes of presentation of videos, animations, simulations, and augmented reality that help students visualize complex Science Education phenomena such as cell division, photosynthesis, and genetic coding more effectively. These tools not only increase comprehension but also enhance students' interest and motivation in biology (Aliyu *et'al*., 2022).

In Nigeria, the Federal Government has repeatedly acknowledged the importance of integrating digital technology into Education at all levels. Initiatives such as the National Policy on ICT in Education (2019) underscore the need for digital literacy among teachers and students, as well as the provision of infrastructure to support e-learning and blended instructional approaches. Despite such policy frameworks, the implementation of digital education strategies in most Nigerian universities remains inadequate due to infrastructural limitations, lack of training for educators, irregular power supply, and poor internet connectivity (Okoye & Nwabueze, 2020). These challenges are even more pronounced in Northern Nigeria, where security concerns and economic constraints further limit educational innovation. At the University of Maiduguri, located in Borno State is an area deeply affected by insurgency and developmental challenges, the effective integration of digital tools in science education has the potential to bridge learning gaps and enhance academic resilience. The

use of digital platforms such as Google Classroom, Moodle, Zoom, YouTube, and simulation applications in Science Education can serve as alternative or supplementary resources to conventional laboratory sessions and classroom lectures, especially when physical access to laboratories and classrooms is constrained (Goni *et'al*., 2021). With the disruptions caused by the COVID-19 pandemic, many universities globally, including those in Nigeria, were compelled to embrace digital learning. This transition exposed both the possibilities and limitations of digital education in Nigerian universities and underscored the urgency of building sustainable digital teaching systems (Adebayo & Olatunji, 2020).

Several studies have indicated that digital tools have positive impacts on students' academic performance and conceptual understanding. For instance, Arowolo and Ogundele (2020) found that the use of simulation software in teaching Science Education significantly improved students' grasp of difficult concepts and promoted higher retention rates. Similarly, Ukwuoma (2021) reported that students exposed to digital visual aids scored significantly higher in practical Science Education examinations compared to those taught using conventional methods. These findings suggest that digital tools are not merely supplementary but can serve as critical enablers of effective science education. However, the adoption of digital tools in Science Education is not without challenges. Many Science Education lecturers lack adequate digital literacy or training in educational technologies, which inhibits their ability to utilize available digital tools optimally (Onasanya *et'al*., 2019). In addition, many students lack personal access to smartphones, laptops, or reliable internet services, thereby limiting their engagement with digital learning platforms. Even in instances where digital tools are available, there are often issues of poor instructional design, limited interactivity, and a mismatch between the tools used and the learning objectives (Eke, 2018). It is important to note that the effective integration of digital tools in science education requires a holistic approach involving policy support, infrastructure development, curriculum redesign, and teacher professional development. Institutions such as the University of Maiduguri need to invest in digital infrastructure, equip Science Education laboratories with interactive resources, and train faculty members in modern pedagogical strategies that leverage technology. Furthermore, it is essential to contextualize digital education strategies to reflect local realities, such as socio-economic factors, cultural attitudes, and available resources (Yusuf & Balogun, 2022). This study, therefore, seeks to examine the utilization

of digital tools in enhancing Science Education in the University of Maiduguri. Despite the growing recognition of digital technologies in education, their adoption in Science Education teaching and learning at the University of Maiduguri appears to be limited. Many lecturers still rely on traditional teaching methods, and students have restricted access to modern digital learning resources. Moreover, infrastructural challenges such as unreliable internet connectivity, inadequate computers, insufficient training for lecturers, and limited institutional support further hinder the effective integration of digital tools into the Science Education curriculum.

This situation raises concerns about the quality of science education and its ability to meet current academic and professional standards. There is a need to understand the current status of digital tool utilization in Science Education at the University of Maiduguri, assess the factors promoting or hindering their use, and explore how these tools can be leveraged to improve learning outcomes. Without such an inquiry, the university may miss valuable opportunities to enhance science education and better prepare students for careers in science education and related fields.

Aims and Objectives of the Study

The aim of this study is to assess the utilisation of digital tools in enhancing teaching and learning of Science Education in University of Maiduguri, Borno State. The specific objectives are to:

1. Examine the types of digital tools currently used in teaching Science Education in University of Maiduguri.
2. Evaluate the perceived impact of digital tools on students' learning outcomes in teaching Science Education in University of Maiduguri.
3. Identify the challenges faced by lecturers in using digital tools for teaching Science Education in University of Maiduguri.
4. Identify the challenges faced by students in using digital tools for teaching and learning of Science Education in University of Maiduguri.
5. Propose strategies to improve the integration of digital tools in Science Education teaching and learning in University of Maiduguri.

Research Questions

The study was guided by the following research questions:

1. What are the types of digital tools that are currently in used for teaching Science Education in University of Maiduguri?
2. How do students perceive the impact of digital tools on Students' learning outcomes in Science Education in University of Maiduguri?
3. What are the challenges do lecturers faced in using digital tools for teaching Science Education in University of Maiduguri?
4. What challenges do students face in using digital tools for learning Science Education in University of Maiduguri?
5. What strategies can be proposed to improve the integration of digital tools in the teaching and learning of Science Educations in University of Maiduguri?

Methodology

This study adopted a descriptive survey research design, which is appropriate for investigating the current use, impact, challenges, and strategies related to digital tools in Science Education. The choice of this design is based on its suitability for obtaining factual information from a population regarding their attitudes, opinions, and experiences. The survey design allows the Researchers to describe existing conditions without manipulating variables, making it ideal for capturing the perceptions of students and lecturers within the natural setting of the University of Maiduguri. This approach enables a systematic collection of data on the extent to which digital tools are integrated into Science Education Curriculum and how they affect teaching and learning outcomes.

The target population for this study comprised all Science Education lecturers and undergraduate students in the Department of Science Education, Faculty of Education, University of Maiduguri. This includes participants from different academic levels (100 to 400 level students) and lecturers (assistant lecturers to professors). A simple random sampling technique was used to ensure representation of Science Education Undergraduate students of all sciences and no sampling technique used for Lecturers; the entire numbers of science Education lecturers were used. The study selected a sample size of 120 respondents, which included 20 lecturers and 100 Science Education undergraduate students using a simple random sampling technique drawn from the total population of 2,316 undergraduate students and 20 lecturers from the Department of Science Education, Faculty of

Education University of Maiduguri. This sample was deemed adequate based on the population size and the need for diversity in responses.

The instrument used for data collection in this study was closed and open-ended structured questionnaire titled Digital Tool Structured Questionnaire (DTSQ) developed by the researchers. The questionnaire consisted of both closed-ended and open-ended items, designed to solicit information on the types of digital tools used, their perceived effectiveness, challenges encountered in their application, and suggestions for improvement. The closed-ended questions utilized a 4-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree" to measure perceptions quantitatively. The open-ended questions allowed respondents to elaborate on their experiences and propose specific recommendations. The instrument was validated by four experts from Faculty of Education; three were from Science Education and one from Test and Measurement unit based on face and content validity and the reliability index of the instrument established was at 0.87 using Cronbach Alpha statistical tool for its consistency.

The data collection process began after obtaining approval from the Head of Department, Department of Science Education, Faculty of Education, University of Maiduguri. Permission was also sought from the heads of relevant departments. The researchers' personally administered the questionnaires to ensure that the instructions were well understood and to increase the response rate. In cases where lecturers or students were unavailable, the questionnaires were distributed via email and WhatsApp and collected upon completion. Out of the 120 distributed Questionnaires 112 were retrieved and 8 unretrieved questionnaire that is 92 numbers of students and 20 Science Education Lecturers. With 93.3 percent of retrieved questionnaires and 6.7 percent of unretrieved questionnaires which has not affected the analysis of the data. The data collected and organized from the questionnaires were analysed using percentage and frequency tables.

Results

Research Question 1: What are the types of digital tools that are currently in used for teaching Science Education in University of Maiduguri?

Table 4.2: Responses on Types and Usage of Digital Tools in Science Education

S/N	Statement	SA	A	D	SD	Total
1	I frequently use digital tools (e.g., Zoom, Moodle, YouTube, and Google Classroom) in	40 (35.7%)	38 (33.9%)	20 (17.9%)	14 (12.5%)	112 (100%)

S/N	Statement	SA	A	D	SD	Total
	science education teaching and learning.					
2	Science Education lessons are often supported with multimedia presentations (for example animations, videos, simulations).	36 (32.1%)	40 (35.7%)	22 (19.6%)	14 (12.5%)	112 (100%)
3	Virtual laboratories and simulations are used in my science education practicals for teaching.	28 (25.0%)	34 (30.4%)	30 (26.8%)	20 (17.9%)	112 (100%)
4	I have access to digital tools for science education both within and outside the classroom.	42 (37.5%)	36 (32.1%)	18 (16.1%)	16 (14.3%)	112 (100%)

Table 4.2 shows respondents' views on the types and usage of digital tools in science education. On the first statement, 40 respondents (35.7%) strongly agreed and 38 (33.9%) agreed that they frequently use digital tools such as Zoom, Moodle, YouTube, and Google Classroom. However, 20 respondents (17.9%) disagreed, and 14 respondents (12.5%) strongly disagreed. This indicates that a majority (69.6%) of respondents acknowledged frequent use of digital tools, though a notable minority still reported limited usage. On multimedia support for science lessons, 36 respondents (32.1%) strongly agreed and 40 (35.7%) agreed, totalling 67.8%, while 22 respondents (19.6%) disagreed and 14 (12.5%) strongly disagreed. This suggests that most Science Education lessons are enhanced with multimedia presentations, but a considerable proportion (32.1%) indicated otherwise, reflecting possible inconsistencies across courses or lecturers. For the use of virtual laboratories and simulations, responses were more divided: 28 respondents (25.0%) strongly agreed and 34 (30.4%) agreed, making 55.4%, while 30 respondents (26.8%) disagreed and 20 respondents (17.9%) strongly disagreed, totalling 44.7%. This indicates that while virtual laboratories are applied in science education, their adoption is not yet widespread, possibly due to infrastructural or training limitations. Regarding access to digital tools within and outside the classroom, 42 respondents (37.5%) strongly agreed and 36 (32.1%) agreed, summing up to 69.6%, while 18 respondents (16.1%) disagreed and 16 respondents (14.3%) strongly disagreed.

Research Question 2: How do students perceive the impact of digital tools on students' learning outcomes in Science Education in University of Maiduguri?

Table 4.3: Perception Responses of Students on the Impact of Digital Tools on Learning Outcomes

S/N	Statement	SA	A	D	SD	Total
1	Digital tools have improved my understanding of biology concepts.	46 (50.0%)	20 (21.7%)	16 (17.4%)	10 (10.9%)	92 (100%)
2	I am more motivated to learn biology through digital platforms.	43 (46.8%)	28 (30.4%)	15 (16.3%)	6 (6.5%)	92 (100%)
3	Digital tools have improved my academic performance or teaching efficiency in science education.	40 (43.5%)	38 (41.3%)	10 (10.9%)	4 (4.3%)	92 (100%)
4	I retain science education knowledge better when digital tools are used.	40 (43.5%)	38 (41.3%)	8 (8.7%)	6 (6.5%)	92 (100%)

Table 4.3 presents perceived responses on the impact of digital tools on science learning outcomes. For the first statement, 46 respondents (50.0%) strongly agreed and 20 respondents (21.7%) agreed that digital tools have improved their understanding of scientific concepts. Only 16 respondents (17.4%) disagreed and 12 (10.7%) strongly disagreed. This shows that a significant majority (71.7%) perceived digital tools as beneficial in enhancing their conceptual understanding of science education. On motivation, 43 respondents (46.8%) strongly agreed and 28 (30.4%) agreed, amounting to 77.2%, while 15 respondents (16.3%) disagreed and 6 respondents (6.5%) strongly disagreed. This indicates that most participants felt more motivated to engage in science learning and teaching through digital platforms, though a minority expressed limited motivation. Regarding academic performance and teaching efficiency, 40 respondents (43.5%) strongly agreed and 38 (41.3%) agreed, totalling 84.8%. On the other hand, 10 respondents (10.9%) disagreed and 4 (4.3%) strongly disagreed. This suggests that the integration of digital tools is generally seen as improving academic and teaching effectiveness, although some respondents remain unconvinced. Finally, in terms of knowledge retention, 40 respondents (43.5%) strongly agreed and 38 (41.3%) agreed, making 84.8%, while 8 respondents (8.7%) disagreed and 6 respondents (6.5%) strongly disagreed.

Research Question 3: What are the challenges do lecturers faced in using digital tools for teaching Science Education in University of Maiduguri?

Table 4.4: Responses on Challenges Faced by Lecturers in Using Digital Tools in Teaching Science Education

S/N	Statement	SA	A	D	SD	Total
1	Lack of reliable electricity supply hinders my	10	4	4	2	20

S/N	Statement	SA	A	D	SD	Total
	ability to effectively use digital tools in teaching science education.	(50.0%)	(20.0%)	(20.0%)	(10.0%)	(100%)
2	Inadequate internet connectivity limits my use of online resources and platforms for teaching science education.	10 (50.0%)	6 (30.0%)	3 (15.0%)	1 (5.0%)	20 (100%)
3	I have not received sufficient training on how to effectively integrate digital tools into science education teaching.	8 (40.0%)	8 (40.0%)	2 (10.0%)	2 (10.0%)	20 (100%)
4	Heavy workload and limited time discourage me from preparing digital teaching materials.	12 (60.0%)	4 (20.0%)	3 (15.0%)	1 (5.0%)	20 (100%)

Table 4.4 highlights the challenges faced by lecturers in using digital tools for teaching science education. A large majority, 10 respondents (50.0%) strongly agreed and 4 (20.0%) agreed, that unreliable electricity supply hinders effective use of digital tools. Only 4 respondents (20.0%) disagreed and 2 (10.0%) strongly disagreed. This shows that electricity supply remains a major barrier, affecting over three-quarters (70.0%) of respondents. For internet connectivity, 10 respondents (50.0%) strongly agreed and 6 (30.0%) agreed, totalling 80.0%, while 3 respondents (15.0%) disagreed and 1 (5.0%) strongly disagreed. This indicates that inadequate and unstable internet access is a significant challenge limiting lecturers' ability to integrate online resources effectively. On training, 8 respondents (40.0%) strongly agreed and 8 (40.0%) agreed, giving 80.0%, while 2 respondents (10.0%) disagreed and 2 (10.0%) strongly disagreed. This suggests that many lecturers have not received adequate training on digital pedagogy, which affects their ability to integrate tools optimally. Concerning workload and time constraints, 12 respondents (60.0%) strongly agreed and 4 (20.0%) agreed, making 80.0%, while 3 respondents (15.0%) disagreed and 1 (5.0%) strongly disagreed.

Research Question 4: What challenges do students face in using digital tools for learning Science Education in University of Maiduguri?

Table 4.5: Responses on Challenges Faced by Students in Using Digital Tools (N = 92)

S/N	Statement	SA	A	D	SD	Total
1	I do not have regular access to laptops, smartphones, or other devices needed for digital learning.	46 (50.0%)	20 (21.7%)	16 (17.4%)	10 (10.9%)	92 (100%)

S/N	Statement	SA	A	D	SD	Total
2	High cost of internet data prevents me from fully participating in digital learning activities in science education.	43 (46.8%)	28 (30.4%)	15 (16.3%)	6 (6.5%)	92 (100%)
3	Poor internet connectivity makes it difficult to access online science education resources and classes.	40 (43.5%)	38 (41.3%)	10 (10.9%)	4 (4.3%)	92 (100%)
4	I lack adequate skills to effectively use digital platforms for learning science education.	40 (43.5%)	38 (41.3%)	8 (8.7%)	6 (6.5%)	92 (100%)

Table 4.5 presents the challenges faced by students in using digital tools for Science education. Regarding device access, 46 respondents (50.0%) strongly agreed and 20 (21.7%) agreed, totalling 71.7%, that they lack regular access to laptops, smartphones, or similar devices. Meanwhile, 16 respondents (17.3%) disagreed and 10 (10.9%) strongly disagreed, suggesting that while many students face device access challenges, a notable portion does not. On the cost of internet data, 43 respondents (46.8%) strongly agreed and 28 (30.4%) agreed, summing to 77.2%, while only 10 (10.9%) disagreed and 4 (4.3%) strongly disagreed. This indicates that expensive data remains a major obstacle limiting students' participation in digital learning. For internet connectivity, 40 respondents (43.5%) strongly agreed and 38 (41.3%) agreed, making 84.8%, while 10 (10.9%) disagreed and 4 (4.3%) strongly disagreed. This reflects that poor and unstable internet service is a significant barrier to accessing online biology resources. On digital skills, 40 respondents (43.5%) strongly agreed and 38 (41.3%) agreed, giving 84.8%, while 8 (8.7%) disagreed and 6 (6.5%) strongly disagreed, totalling 15.2%. This shows that more are skilful in their digital abilities and others.

Research Question 5: What strategies can be proposed to improve the integration of digital tools in the teaching and learning of Science Education in University of Maiduguri?

Table 4.6: Responses on Strategies for Improving the Use of Digital Tools in Science Education

S/N	Statement	SA	A	D	SD	Total
1	Regular training should be provided for lecturers/students on the use of digital tools.	56 (50.0%)	34 (30.4%)	12 (10.7%)	10 (8.9%)	112 (100%)
2	The university should invest more in ICT	60	32	12	8 (7.1%)	112

S/N	Statement	SA	A	D	SD	Total
	infrastructure for teaching Science Education.	(53.6%)	(28.6%)	(10.7%)		(100%)
3	Digital tools should be aligned with the science education curriculum to enhance effectiveness.	48 (42.9%)	40 (35.7%)	14 (12.5%)	10 (8.9%)	112 (100%)
4	Localized content should be developed to suit our context (language, examples, resources).	46 (41.1%)	38 (33.9%)	16 (14.3%)	12 (10.7%)	112 (100%)

Table 4.6 presents respondents' views on strategies for improving the use of digital tools in science education. Concerning training, 56 respondents (50.0%) strongly agreed and 34 (30.4%) agreed, giving a combined 80.4%, while only 12 (10.7%) disagreed and 10 (8.9%) strongly disagreed. For ICT infrastructure, 60 respondents (53.6%) strongly agreed and 32 (28.6%) agreed, totalling 82.2%, compared to 12 (10.7%) who disagreed and 8 (7.1%) who strongly disagreed. On aligning digital tools with the biology curriculum, 48 respondents (42.9%) strongly agreed and 40 (35.7%) agreed, making 78.6%, while 14 (12.5%) disagreed and 10 (8.9%) strongly disagreed. For localized content, 46 respondents (41.1%) strongly agreed and 38 (33.9%) agreed, representing 75%, whereas 16 respondents (14.3%) disagreed and 12 (10.7%) strongly disagreed.

Summary of Findings

1. Findings revealed that a variety of digital tools such as Google Classroom, YouTube, Zoom, Moodle, and multimedia presentations are in use by both lecturers and students.
2. The study further established that digital tools have a significant positive impact on learning outcomes.
3. On the challenges faced by lecturers, the study identified unreliable electricity supply, inadequate internet connectivity, insufficient training, and heavy workload as major barriers to the effective use of digital tools.
4. Similarly, students highlighted obstacles such as lack of regular access to digital devices, high cost of internet data, poor connectivity, and inadequate digital literacy skills, which all constrain their participation in digital learning.

5. The key strategies included regular training on digital pedagogy, increased investment in ICT infrastructure, alignment of digital tools with the Science Education curriculum, and the development of localized content to suit the context of Maiduguri.

Discussion

The findings of this study support existing research that emphasizes the transformative role of digital tools in science education. In line with Arowolo and Ogundele (2020), the study showed that simulation-based and multimedia resources improved students' comprehension of abstract Science Education concepts, thereby enhancing understanding and retention. This reflects the constructivist learning theory, which posits that active interaction with instructional resources deepens cognitive engagement and fosters better learning outcomes.

The results also confirm that digital tools stimulate students' motivation and active participation. This finding resonates with the Technology Acceptance Model (Davis, 1989), which emphasizes perceived usefulness and ease of use as key determinants of technology adoption. Students and lecturers reported greater enthusiasm and willingness to use platforms such as Zoom, Moodle, and Google Classroom because they found them beneficial and relatively easy to navigate. This suggests that with improved digital literacy and access, adoption rates could grow even higher.

However, the challenges reported highlight systemic issues that continue to hinder ICT integration in Nigerian universities. Problems such as unstable electricity, poor internet connectivity, and infrastructural deficiencies are consistent with the findings of Okoye and Nwabueze (2020) and Yusuf and Balogun (2022). In Maiduguri, where socio-economic and security challenges are more pronounced, these barriers are magnified, further restricting the widespread use of advanced digital resources such as virtual laboratories and real-time simulations. Importantly, the study revealed that both lecturers and students are not resistant to technology adoption but constrained by structural barriers. Their recommendations for training, infrastructural improvement, and curriculum alignment affirm the argument of Onasanya *et'al.* (2019) that competence development and institutional support are critical for effective technology integration. This shows that with adequate support, lecturers can shift more effectively from teacher-centred to student-centred digital pedagogy, while students can maximize digital resources for improved learning.

Conclusion

Based on the findings, the study concludes that digital tools play a vital role in enriching the teaching and learning of Science Education at the University of Maiduguri. Their integration improves comprehension, enhances motivation, and supports retention of knowledge, thereby positively impacting both teaching and learning outcomes. However, the effectiveness of these tools is currently limited by infrastructural, financial, and technical challenges, which hinder their optimal utilization. The study affirms that the barriers are largely structural rather than attitudinal, as both lecturers and students demonstrated a positive disposition toward adopting digital tools. Thus, addressing the infrastructural and training gaps will significantly strengthen the integration of technology into science education. Ultimately, the adoption of digital tools is not only essential for improving academic outcomes but also aligns the University of Maiduguri with global trends in higher education and supports Nigeria's educational development goals.

Recommendations

In light of the findings, the following recommendations were made:

1. The University of Maiduguri should invest more in ICT infrastructure, including stable electricity supply, reliable internet connectivity, and modern digital teaching facilities, to create an enabling environment for digital learning.
2. Regular training workshops and seminars should be organized for both lecturers and students to build competence in the effective use of digital tools for Science Education teaching and learning.
3. Digital tools and resources should be integrated into the Science Education curriculum to ensure that their use is aligned with instructional objectives and learning outcomes.
4. Context-specific digital resources should be developed to reflect local realities, examples, and languages, making the tools more relatable and effective for students in Maiduguri.
5. The University management should formulate and enforce policies that encourage and reward lecturers for adopting digital pedagogy, while also providing technical support to reduce workload and resistance.

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