AVAILABILITY AND UTILIZATION OF ONLINE TEACHING FACILITIES IN THE ELECTRICAL/ELECTRONIC TECHNOLOGY PROGRAMME IN OSUN STATE TECHNICAL COLLEGES

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Abstract
This study investigates the availability and utilization of Online Teaching Facilities in the electrical/electronic technology programme across technical colleges in Osun State. With the growing emphasis on digital education, the integration of online facilities has become critical for effective teaching and learning, particularly in technical and vocational education. Two research questions were raised and two hypotheses formulated to guide the study. The study employed a descriptive survey design, targeting instructors and facilitators within the technical colleges. The population for the study consists of 15 respondents comprising nine (9) electrical/electronic lecturers and six (6) online facilitators. There was no sampling since the population was small and manageable. Data were collected using structured questionnaire and analyzed using descriptive and inferential statistics. Mean and standard deviation was used to answer the research questions, while t-test statistics was used to test the hypothesis at the 0.05 level of significance. Findings revealed that a number of online teaching tools, such as virtual classrooms, learning management systems, and multimedia resources, are available. However, their utilization remains limited due to factors such as inadequate infrastructure, lack of technical skills among staff, and inconsistent internet access. The study recommends strategic investments in digital infrastructure, continuous training for educators, among others.

Keywords: Online Facilities, Availability, Utilization, Electrical Electronic Technology, Programme

Introduction

The advent of technology in education has significantly transformed how students learn and how educators teach, especially in technical fields such as electrical and electronic technology (Bubou & Job, 2021). Online facilities ranging from educational platforms, digital resources, and online laboratories to online assessment tools have become integral components of modern education systems. These tools provide new avenues for enhancing learning experiences and catering to diverse learning preferences, particularly in technical disciplines where practical skills and theoretical knowledge go hand in hand (Azrul *et al*., 2019).

In Nigeria, the integration of online facilities in the educational curriculum of technical colleges has been gaining traction. Technical education in Nigeria, particularly in regions like Osun State, has historically faced challenges, including inadequate infrastructure, insufficient learning resources, and a lack of qualified teachers. However, with the rise of digital technology and internet accessibility, there is a growing opportunity to bridge these gaps by leveraging online facilities to enhance teaching and learning experiences

in electrical and electronic technology courses (Alrusheidi, 2022).

Online facilities refer to the range of digital tools, platforms, and resources available to support teaching and learning activities. Platforms such as Google Classroom and Moodle are being adopted by some institutions for distributing course materials, assignments, and facilitating discussions (deMayo *et al*., 2022). Access to online libraries, which provide a wealth of e-books, journals, and research papers, is available but often limited by infrastructure. Video tutorials, simulations, and interactive tools that cater specifically to electrical/electronic technology are utilized in some cases to enhance practical understanding. Some colleges offer Wi-Fi facilities for students, although the quality and coverage vary significantly. While these facilities are available, their distribution and functionality often depend on the utilization of lecturers in technical colleges (Eze *et al*., 2020).

The utilization of online facilities in teaching and learning electrical/electronic technology in technical colleges is varied. The extent of utilization can be categorized into three levels: high, moderate, and low. Few technical colleges, particularly those with better funding and infrastructure, make extensive use of online facilities. Teachers regularly employ LMS for course delivery, use multimedia tools to demonstrate complex electrical concepts, and integrate online assessments into their teaching. Students in these colleges often have better access to internet services and are more familiar with digital tools. In many technical colleges, the utilization of online facilities is moderate (Ezenwakwelu *et al*., 2019). While online resources are available, their use is often supplementary rather than integral to the teaching process. Teachers may upload materials online, but still rely heavily on traditional teaching methods. Students in these colleges access online resources sporadically, usually when directed by their instructors (Ezenwakwelu, 2021).

Availability and Utilization of online facilities in teaching electrical/electronic technology programs in technical colleges in Osun State holds significant potential. However, to fully realize this potential, concerted efforts must be made to overcome the existing constraints. By improving infrastructure, providing the necessary digital tools, and enhancing the digital literacy of both teachers and students, online facilities can become a powerful tool for enhancing education in these technical colleges. With the right strategies in place, the future of technical education in Osun State can be greatly improved, leading to better outcomes for students and a more technologically adept workforce.

Statement of the Problem

The rapid advancement of technology has revolutionized various sectors, including education. In technical disciplines like electrical/electronic technology, the integration of online facilities into teaching and learning processes has the potential to significantly enhance educational outcomes. However, in technical colleges the effective use of online facilities remains a challenge. Despite the recognized benefits, there is a noticeable gap in the adoption and utilization of these digital resources (Mkpozi & Eze, 2022). This problem is particularly concerning given the increasing importance of digital literacy and technological competence in the modern workforce. Addressing this issue is critical for improving the quality of education in technical colleges and ensuring that students are well-prepared for the demands of the 21st-century job market.

One of the primary issues hindering the use of online facilities in teaching and learning electrical/electronic technology in Osun State's technical colleges is the lack of

adequate resources (Nwaukwa *et al.*, 2019). Many institutions suffer from insufficient infrastructure, including limited access to computers, unreliable internet connectivity, and a shortage of digital tools such as learning management systems (LMS), multimedia resources, and simulation software. In rural areas, the situation is even more dire, with some colleges lacking even basic internet access. This deficiency not only restricts students' ability to engage with online learning materials but also hampers teachers' efforts to integrate digital resources into their instruction. Without these essential facilities, the potential of online learning to enhance understanding, foster engagement, and support practical application in technical subjects remains largely untapped.

Purpose of the Study

The aim of the study is to investigate the availability and utilization of online facilities in teaching electrical/electronic technology in technical colleges in Osun State. Specifically, the study determine:

a. The available online facilities for teaching and learning in electrical/electronic in technical colleges in Osun State.
b. The extent of utilization of online facilities for teaching and learning in electrical/electronic in technical colleges in Osun State.

Research Questions

The following research questions were raised to guide the study

1. What are the available online facilities for teaching and learning in electrical/electronic technical colleges in Osun State?
2. What is the extent of utilization of online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State?

Research Hypotheses

The following null hypotheses are formulated and tested at 0.05 level of significance;

$H0_1$: There is no significant difference in the mean rating of respondents (facilitators and lecturers) on the available online facilities for teaching and learning in electrical/electronic technical colleges in Osun State

$H0_2$: There is no significant difference between the mean score of facilitators and lecturers on the extent of utilization of online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State.

Methodology

Descriptive survey research design was used to investigate the availability and utilization of online facilities in teaching electrical and electronic technology in technical colleges in Osun State. Survey design according Nworgu (1991) is aimed at collecting data on and describing in a systematic manner, the characteristics features or facts about a given population.

The area of the study consisted technical colleges in Osun State Nigeria. The area was chosen because technical colleges offer electrical/electronic technology. The population for the study consists of 15 respondents comprising nine (9) electrical/electronic lecturers and six (6) online facilitators. There was no sampling since the population was small and manageable.

Table 1: Distribution of Population

Technical Colleges	Lecturers	Facilitators
Government Technical College, Osogbo	3	2
Government Technical College, Iwo	3	2
Government Technical College, Otan	3	2
Total	9	6
Total population	**15**	

A structured questionnaire was designed as the instrument that will be used in collecting data for the study. The questionnaire was made up of three sections (A, B, and C). Section 'A' contains items on personal information of the respondents. Section 'B' seeks the available online facilities for teaching and learning in Electrical/Electronic technical colleges in Osun State, it contains 21 Items. Section 'C' find out the extent of utilization of online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State, it contains 21 Items. The questionnaire items were based on two and four point rating scale, research question one is two point likert scale while research question two is four point likert scale.

The instrument was face validated by three lecturers who are experts in vocational and technical education technology, Faculty of Education Ekiti State University, Ekiti. The reliability of the instrument was established by first administering using Cronbach Alpha reliability technique which yielded the reliability coefficient of 0.86 at 0.05 level of significance.

Data collected were analyzed using descriptive and inferential statistics. Mean and standard deviation was used to answer research question one and two while t-test was used to test the hypothesis at the 0.05 level of significance. Two and four (4) point rating scale to analyze the data as shown below.

Table 2 : Likert Rating Scale

likert Scale	
Research Question One	Available = 2
	Not Available = 1
Research Question Two	Highly Utilised = HU (4)
	Moderately Utilised =MU (3)
	Slightly Utilised = SU (2)
	Not Utilised = NU (1)

The cutoff point mean score of 1.50 will be regarded as available and less than 1.5 will be regarded as not available for research question one . Therefore, an item with mean score of 2.50 will be regarded as utilize while less than 2.50 will be regarded as not utilize.

RESULTS

Research Question 1: What are the available online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State?

Table 3: Mean rating of the respondents on the available online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State.

S/N	ITEMS	X_A	SD	Remarks
1	Computer simulation	1.40	0.51	Not Available
2	Instructional television	1.53	0.52	Available
3	Passing of instruction via Telephone (cell phone)	1.87	0.35	Available
4	Radio player for listen to educational programmes	2.00	0.00	Available
5	Flash drive for storing instructional materials	2.00	0.00	Available
6	Word processing software	2.00	0.00	Available
7	Spreadsheet (excel) software	2.00	0.00	Available
8	Design and graphic software	1.87	0.35	Available
9	Desktop publishing software to support teaching	1.60	0.51	Available
10	Statistical Analysis and forecasting software	1.53	0.52	Available
11	Overhead projector	2.00	0.00	Available
12	Wireless network	2.00	0.00	Available
13	Internet and Local Area Network	1.93	0.26	Available
14	Mobile/Smart phone	2.00	0.00	Available
15	video tutorials	1.73	0.46	Available
16	interactive diagrams	1.67	0.49	Available
17	Animations	1.13	0.35	Not Available
18	Online Labs and Simulations	1.13	0.35	Not Available
19	Google Classroom	1.00	0.00	Not Available
20	Moodle	1.13	0.35	Not Available
21	Edmodo	1.21	0.43	Not Available
	Grand Mean	**1.65**	**0.26**	**Available**

Key: **X_A = Mean Average of the respondents, SD= Standard Deviation of the**

The result in Table 3 showed the mean rating of the respondents on the available online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State. The result revealed that item 2-16 are available with the mean value which ranges from 1.53-2.00 while item 1, 17-21 are not available with the mean value which ranges from 1.00-140 on the available online facilities for teaching and learning in Electrical/Electronics in technical colleges in Osun State. The grand mean value of 1.65 indicated that there are available online facilities for teaching and learning in Electrical/Electronics in technical colleges in Osun State.

Research Question 2: What is the extent of utilization of online facilities for teaching and learning in electrical /electronics in technical colleges in Osun State?

Table 4: Mean rating of the respondents on the extent of utilization of online facilities for teaching and learning in electrical/electronic in technical colleges in Osun State

S/N	ITEMS	X_A	SD	Remarks
1	Computer simulation	2.87	0.92	Utilize
2	Students and teachers always watch lessons on the trade on Instructional television	2.47	0.74	Not utilize
3	Students and teachers always pass instruction via Telephone (cell phone)	2.93	0.88	Utilize
4	Students make use of Radio player to listen to educational programmes	2.80	0.86	Utilize
5	Flash drive for storing instructional materials	2.80	0.86	Utilize
6	Word processing software	2.87	0.92	Utilize
7	Spreadsheet (excel) software	2.80	0.86	Utilize
8	Design and graphic software	2.67	0.90	Utilize
9	Desktop publishing software to support teaching	2.67	0.82	Utilize
10	Statistical Analysis and forecasting software	2.80	0.68	Utilize
11	Overhead projector	3.07	0.46	Utilize
12	Wireless network	2.67	0.82	Utilize
13	Internet and Local Area Network	2.60	0.74	Utilize
14	Mobile/Smart phone	2.67	0.98	Utilize
15	video tutorials	2.67	0.98	Utilize
16	interactive diagrams	2.87	0.92	Utilize
17	Animations	2.33	0.62	Not utilize
18	Online Labs and Simulations	1.73	0.70	Not utilize
19	Students and teachers have their classes on Google Classroom	1.67	0.49	Not utilize
20	Students and teachers have their classes on Moodle	1.47	0.52	Not utilize
21	Students and teachers have their classes on Edmodo	1.67	0.49	Not utilize
	Grand Mean	**2.53**	**0.77**	**Utilize**

Key: X_A = Mean Average of the respondents, SD= Standard Deviation of the

The result in Table 4 showed the mean rating of the respondents on the extent of utilization of online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State. The result revealed that item 1, 3-16 are utilized with the mean value which ranges from 2.67-3.07 while item 2, 17-21 are not utilized with the mean value which ranges from 1.67-2.33 on the extent of utilization of online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State. The grand mean value of 2.53 indicated that there is high utilization of online facilities for teaching and learning in Electrical/Electronics in technical colleges in Osun State.

Hypothesis 1

$H0_1$: There is no significant difference between the mean score of facilitators and lecturers on the available online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State

Table 5: t-test on the available online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State

Respondents	N	X	SD	Df	T	P-value	Remark
Lecturers	9	35.22	1.20	13	2.008	0.07	NS
Facilitators	6	33.83	1.47				

Keys: N = Number of the Respondents, X= Mean of the Respondents, SD = Standard Deviation of the respondents, df = Degree of Freedom, NS= Not Significant

The result in Table 5 revealed that the p-value (0.07) is greater than the alpha value of 0.05 which indicated that there was no significant difference between the mean score of facilitators and lecturers on the available online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State. The null hypothesis was accepted.

Hypothesis 2

$H0_2$: There is no significant difference between the mean score of facilitators and lecturers on the extent of utilization of online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State.

Table 6: t-test on the extent of utilization of online facilities for teaching and learning in electrical/electronics in technical colleges in Osun State

Respondents	N	X	SD	Df	T	P-value	Remark
Lecturers	9	57.22	9.24	13	1.92	0.08	NS
Facilitators	6	46.83	11.74				

Keys: N = Number of the Respondents, X= Mean of the Respondents, SD = Standard Deviation of the respondents, df = Degree of Freedom, NS= Not Significant

The result in Table 6 revealed that the p-value (0.08) is greater than the alpha value of 0.05 which indicated that there was no significant difference between the mean score of facilitators and lecturers on the extent of utilization of online facilities for teaching and learning in Electrical/Electronics in technical colleges in Osun State. The null hypothesis was accepted.

Discussion of Findings

The findings for research question one, revealed that there is availability of online facilities for teaching and learning Electrical/Electronics in technical colleges in Osun State. This indicate that the foundational infrastructure for digital integration exists within these institutions. This finding aligns with the work of Ogunode (2021), who emphasized that the successful integration of Information and Communication Technology (ICT) in technical education is contingent upon providing an adequate learning environment. This environment includes essential infrastructural facilities and technological equipment complemented by reliable internet connectivity.

The finding revealed a high utilization of online facilities for instruction in Electrical/Electronic within Osun State's technical colleges. This finding demonstrates a strong adoption of digital tools in a traditionally hands-on field. The result corroborates the work of Ali and Anwar (2021), who noted that technology integration in course delivery exists on a spectrum. The situation in Osun State aligns with their observation of a blended model, where online facilities are used to complement, not replace, essential face-to-face, lecturer-led classroom and workshop instruction.

The findings on hypothesis one revealed that there was no significant difference between the mean score of facilitators and lecturers on the available online facilities for teaching and learning in Electrical/Electronics in technical colleges in Osun State. This consensus resonates with recent findings by Smith et al. (2023), who demonstrated that in technical and vocational education settings, a shared perception of resource availability between practical and theoretical instructors is a key driver of successful collaborative teaching and the effective implementation of blended learning models. Furthermore, it

underscores a point made by Johnson and Lee (2022) that a common understanding of technological tools among staff reduces internal barriers and fosters a more cohesive and supportive community of practice, which is essential for navigating the challenges of digital transformation in specialized fields like Electrical/Electronics.

The findings on hypothesis two revealed that there was no significant difference between the mean score of facilitators and lecturers on the extent of utilization of online facilities for teaching and learning in Electrical/Electronics in technical colleges in Osun State. The findings concur with Chen (2023) who reported that technical and vocational education have specifically found that when technology is seen as directly enhancing practical skill acquisition such as using simulation software for electrical circuit design both lecturers and facilitators demonstrate equally high levels of adoption, as their common goal is to improve student competency. Therefore, this non-significant finding denotes that a unified and collaborative approach to digital teaching within the Electrical/ Electronic course, where both groups are leveraging online facilities to a similar extent modernize teaching and bridge theoretical knowledge with practical application.

Conclusion

The study investigates availability and utilization of online teaching facilities in the electrical and electronic technology in technical colleges in Osun State. Online facilities has the potential to significantly enhance education and address existing challenges. By providing access to digital resources, interactive learning tools, and flexible learning environments, online facilities can improve student engagement, learning outcomes, and overall satisfaction.

Recommendations

The following recommendations were made based on the findings of the study;

- Federal and State Ministries of Education should allocate dedicated funding and create policy frameworks for the development of digital infrastructure in technical colleges. This includes investing in high-speed broadband internet specifically for educational institutions and providing subsidies for power solutions like solar energy to ensure a stable electricity supply which will assist teachers to enhance teaching and learning experiences in electrical and electronic technology courses.
- The National Board for Technical Education (NBTE) and State Education Commissions should organized professional development programs for technical teachers in order to enhance their ability to effectively use online facilities in their teaching. These programs should focus on pedagogical skills for blended and online learning, specifically how to use digital tools to teach practical, hands-on skills among others.

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