

**COMPARISON ON PEDAGOGICAL PRACTICE NEEDS OF LECTURERS
ONTECHNOLOGY TOOLS IN TEACHING ELECTRONIC DEVICES IN NIGERIA
CERTIFICATE IN EDUCATION AWARDING INSTITUTIONS IN NORTH-EAST, NIGERIA**

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ABSTRACT

In the 21st century, many changes and innovations have occurred in society. The research dwells the comparison on pedagogical practice that requires a high level of professional knowledge and skill. Two research questions and (2) hypotheses were raised and tested. Descriptive survey research design was employed in the study. Entire elect/electronic technology lecturers with no sampling techniques were in NCE awarding institutions in North-East, Nigeria. Structured questionnaire instruments validated by four experts in two phases within two institutions in North-East. The reliability was ensured by Cronbach Alpha method and the result yielded a reliability coefficient of 0.849. Data collected and analyzed using mean and standard deviation. The independent t-test used to test the hypotheses at 0.05 level of significance. The pedagogical practice were highly needed in comparison for teaching electronic devices. Recommendations were made based on the findings that, electrical/electronic technology lecturers in NCE awarding institutions should actively embrace the ongoing changes in recognizing the importance of pedagogical practice on utilization of digital technology tools incorporating it into their teaching approaches. Additional support in terms of problem-based and project-based teaching to collaborate with industry, partner with technology companies to access the latest ICT tools and innovations. Facilitate guest lectures, internships, and practical sessions using industry-standard software and hardware.

Keywords: Pedagogical Approach, Teaching Strategy, Comparison

1. Introduction

The rapid advancement in utilization of technology tools in digital age has necessitated a fundamental transformation in teaching pedagogy of 21st century. Consequently, Nigeria Certificate in Education (NCE) awarding lecturers must recognize and adapt the needs of employing pedagogical approaches in integration of information and communication technology (ICT) which has become increasingly important in

enhancing the quality of education. However, despite the recognized benefit, that there is growing concern mainly; electrical and electronic technology lecturers face significant challenges in effectively utilizing ICT in their pedagogical practice. According to Santos, Figueiredo & Vieira, (2019), Higher education lectures are increasingly challenged to adopt student-centered approaches to promote a conceptual change in teaching/learning. The student-centered approaches are pedagogical approaches for practice that would promote the involvement of students, improves critical and creative thinking, minimize apathy and subsidize peer-learning, might initiate to adopt and introduced pedagogical practice in teaching. (uniandy, and Abdullah, 2023)

The activities that support the unit of content, the instructional approach such as active learning mode, student to student engagements, teaching to multiple learning styles and variety of assessment or strategies that teachers use to teach student are selected according to the beliefs of the teachers and demands of the task are the pedagogical practice (Martha, Davis & Simone, 2020). According to the Ashraf Yang Zhang Denden Tlili, Liu & Burgos, (2021), pedagogical practice is an important skill to the teachers/lecturers because once teachers/lecturers are well prepared, they would be able to implement the use of digital technologies for information technology across the curriculum as teaching pedagogy. The integrative approach is the pedagogical practice that tries to provide learners with an environment where they can make connections between the current topic they are learning about and other topics they will come across at different stages of the curriculum (Gelles, Lord, Hoople, Chen & Mejia, 2020). This approach is more commonly used in higher education and can help learners gain a broader understanding of the utilization of ICT tools in electronic devices by linking together bits of information they acquire and understanding of skill they will gain.

Moreover, Tsybulsky, Muchnik & Rozanov, (2019) opined that the reflective pedagogical approach focuses primarily on analyzing what the teacher and learners are doing in the classroom. It encourages thinking about figuring out ways to improve student's skill in an attempt to make learning processes more effective for a class of learners. In this vein this approach, can be done through processes such as self-evaluation and self-reflection, used as ways to essentially learn more about on their own practice, improve a certain practice (like small groups and cooperative learning) or to focus on a problem learner having in electronic devices session. Reflective teaching looking at what learners do in the classroom, thinking about why they do it, and thinking about if it works a process of self-observation and self-evaluation. This would also lead to changes and improvements in teaching on utilization of ICT tools for effective pedagogical practice.

Based on aforesaid assertions, NCE awarding institutions lecturers needs to develop pedagogical practice that promote the teaching/learning based on digital literates for every day practice in engaging with literates are timely needed in North-East, Nigeria. Hence, when NCE lecturers are determine to practice any of the 21st century pedagogical practice in order to explore the visible impact in learners in their teaching it will motivate learning and provides independent enquiry without facing much challenges in academic learning institutions in North-East, Nigeria. For this convenient there is needs for an NCE awarding institutions lecturers actively design activities consciously for effective learning through coaching process, modelling or scaffolding, and exploration of digital technologies like any significant piece of knowledge for teaching electronic technology course, as National Commission for Colleges of Education (NCCE) reveals NCE lecturers as key players in developing ICTs Skills as strategies for teaching students since 2004/2005 academic session.

Statement of Problem

In the Context of NCE Awarding Institutions in North-East, Nigeria. Pedagogical practice is paramount with utilization of technology tools knowledge, skills regarding its use as pedagogical practice. These is because, digital technology proficiency is the ability of lecturers to use technology tools appropriately to access, manage, integrate and evaluate information, develop new understanding, and communicates with

others in order to participate effectively in teaching learning process. Egede & Asabor (2019) further stressed that the NCE lecturers lack the necessary training in pedagogical approaches that effectively integrate ICT in their teaching strategies. In similar ways, NCE technology lecturers were lagging pedagogical approaches with new definitions of 21st century to deliver content information using electronic media in teaching. These was quite obvious with these challenges of mismatch in teaching styles without utilizing basic computer skills and its devices for teaching electronic devices effectively, including the development of appropriate digital content, the use of simulation software, and integration of virtual laboratories into their curriculum leading to a reliance on traditional teaching approaches that may not fully prepare students for the demands of the modern technological workforce. Thus, in view of these assertion there is a notable gap in understanding the pedagogical practice needs of lecturers pertaining to incorporation of ICTs in teaching electronic devices in NCE awarding institutions in North-East, Nigeria. Hence, Observation through repeated visitations to some NCE awarding institutions in North-East State appears that lecturers of NCE awarding institutions using obsolete teaching strategies for teaching electrical/electronic without adopting new pedagogical approaches. However, these situations made to affirmed that inadequate pedagogical training of lecturers might lack the necessary training in pedagogical practice approaches that effectively integrate their teaching strategies.

Moreover, by identifying these needs and the associated challenges, it will inform the development of training programs, facilities allocation, and policy recommendations to enhance the quality of teaching and learning in north eastern academic institutions.

Aims and Objectives

The main aim of this study is to examine and compare pedagogical practice approaches needs of lecturers on utilization of technology tools for teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Specifically, the objectives of the study sought to:

1. Examine and compare needs of elect/elect lecturers in integrative pedagogical practice on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North- East, Nigeria.
2. Examine and compare needs of elect/elect lecturers in reflective pedagogical practice for utilizing technology tools in teaching electronic devices in NCE awarding institutions in North- East, Nigeria

Research Questions

1. What are the elect/elect lecturers needs in integrative pedagogical practice in utilizing technology tools in teaching electronic devices in NCE awarding institutions in North- East Nigeria?
2. What are the elect/elect lecturers needs in reflective pedagogical practice in utilizing technology tools for teaching electronic devices in NCE awarding institutions in North-East, Nigeria?

Hypotheses

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

H₀₁: There is no significant difference in between the mean responses of experienced and novice elect/elect lecturers needs in integrative pedagogical practice on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

H₀₂: There is no significant difference in between the mean responses of experienced and novice elect/elect lecturers need in reflective pedagogical practice on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Significance of Study

The findings of the study would benefit electrical/electronic technology lectures/instructors, students, Ministry of Education Science Innovative and Technology in the North-East States of Nigeria. The findings also benefit by curriculum reform planners, parents and guidance, as well as the electrical and electronic technology industries. The immense benefits of the findings will be at Educational Resource Centers and other regulatory bodies as such; NCCE, NBTE, NRDC, NEEDS and TETFUND for research and development record in Federal Republic of Nigeria. The findings provide information for lectures of technology education in higher institutions of learning to improve their teaching to solve the current problem inherent in students' performance.

2.0 LITERATURE REVIEW

Theoretical Framework

Need Assessment Theory

Horny (2010) stated the Needs Theory as a formal set of ideas that is intended to explain why something happens or exists: According to kaufman (1998), "Needs Assessment Theory involves identifying, justifying gaps in results, and placing the gaps in prioritized order for attention". The function of this theory is to guide practice and lead to application of knowledge to solve real-world problems. The needs theory is related to this study because Onwuka (1982), emphasized the fact that before any in- service education programme can be established; the felt need of teacher who will participate in such a programme must be ascertained. Therefore, perceived needs of the teachers must be considered and also in-service education training should be structured to permit their active involvement in order to improve on their skills for effective teaching. Therefore, needs assessment theory support to determine teacher/lecturers need to enhanced their strength, weakness on development areas so that researchers can provide pedagogic activities needed for instructional improvement in relation to relevant technology software'.

Concept of Technological Pedagogical Content Knowledge (TPACK)

The study is hinged on the TPACK Conceptual framework. This framework describes the kinds of knowledge that teachers need in order to teach with technology tools, and the complex ways in which this knowledge interact with one another. Koehler, Mishra, Bouck, DeSchryver, Kereluik, Shin, and Wolf. (2011) describes the concept to which what teachers need to know can be difficult because teaching is an inherently complex, multifaceted activity which occurs in varied settings. By its nature, teaching is an ill-structured problem requiring reasoning about a wide range of interrelated variables such as the background knowledge that students bring into the classroom, teacher and student expectations about the content to be covered, and school and classroom guidelines and rules. Based on this conceptual assertion, the pedagogical practice need of lecturers for teaching electronic technology in NCE Awarding Institutions in use of technology tools into the classroom in order to introduces a new set of variables into the teaching context is relevant.

3.0 METHODOLOGY

The study adopted descriptive survey design. The survey research design examines, current attitudes, beliefs, opinions, or practices of the target population (Creswell 2012). This research design was appropriate because it allow the respondents to put down their views and opinions on pedagogical practice need on integrative and reflective approaches for teaching electronic technology education in NCE awarding institutions in North-East States of Nigeria.

The population was all electrical and electronic technology education lecturers, in NCE awarding institutions with in the north east Nigeria. The study conducted in both State Owned and Federal institutions offering electrical and electronic technology education in North-Eastern, Nigeria. There was no sampling technique adopted for this study to all respondent of electrical and electronic technology education were used. The instrument for data collection was structured questionnaire, which have adapted and modified to suit the research study based on the objectives of the research. The instrument validated by an (4) experts in phases in field of electrical/electronic technology education in department of technology education, Abubakar Tafawa Balewa University, Bauchi (ATBU) and Ramat Polytechnic Maidugugri, Borno State.

The Reliability of the instrument was determined by using Cronbach Alpha which yielded co-efficient value of 0.849. This value indicate that the reliability of the investment was good.

4.0 Results of the Reliability of Instrument

The result of reliability of the instrument are presented in Table: 1.

The pilot study instrument reliability presented the Inter- items correlation with the Cranach Alpha values. The results of the construct reliability test coefficient were greater than 0.70 as recommended as acceptable level by George and Mallery, 2003 in (Allyn and Bacon, 2022).

Table 1: **Construct Reliability**

S/N	Construct	Items	Cronbach Alpha
1	Integrative Approach	16	.875
2	. Reflective Approach	14	.822
Total		30	.849

Results of Research Questions

The results of research questions were presented in Table 2 to 3

Research question One

What are elect/elect lecturer needs on integrative pedagogical practice in utilizing technology tools for teaching electronic devices in NCE awarding institutions in North-East, Nigeria?

Table 2: **Descriptive statistics integrative pedagogical practice needs of elect/elect lecturers in utilizing technology tools in teaching electronic devices in North-East, Nigeria.**

S/ N	ITEMS STATEMENT	X _E	SD _E	X _N	SD _N	X _G	Remark
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1.	Demonstrate how electronic components to simulate in teaching electronic devices	3.2 9	.540	3.29	.717	3.29	HN
2.	Prepare platform like PhET in interactive simulation to promote experiences	3.1 8	.486	2.95	1.02 4	3.07	HN
3.	Implement virtual labs allow students to experiments with circuit and component	3.3 1	.585	3.43	.598	3.37	HN
4.	Ability to platform such as lobster to offer real-time virtual ab experiments	2.9 2	.838	3.19	.680	3.06	HN
5.	Create multimedia presentations like Prezi -Microsoft to illustrate electronic devices,	3.3 9	.731	3.10	.768	3.25	HN
6.	Ability to include images, videos and animations to enhance understanding	3.5 1	.649	3.29	.784	3.40	HN
7.	Encourage teamwork in designing and analyzing electronic devices	3.5 1	.649	3.38	.740	3.45	HN
8.	To engage learners to shear projects Using Google workspace or Microsoft 365	3.3 5	.723	3.19	.873	3.27	HN
9.	Integrate digital textbooks and online to provide up-date information in teaching	3.3 7	.698	3.38	.669	3.38	HN
10	Explore Apps Overlay Digital Information in real world to visualize component in 3D	3.1 4	.707	3.29	.717	3.22	HN
11	To embrace Apps like circuit scribe AR to promote experience in electronic devices.	3.0 6	.556	2.81	1.03 0	2.94	HN
12	Able to develop interconnected content to complete usable of tech tools in teaching	3.1 0	.586	3.14	.573	3.12	HN
13	To set up online discussion forums to facilitate emergent trends and challenges	3.1 2	.726	2.86	.854	2.99	HN
14	Encourage students to share their insights and ask questions on utilizing ICT tools	3.2 2	.715	3.19	.928	3.20	HN

15	Ability to encourage students to build and program their own electronics projects	3.33	.625	3.43	.598	3.38	HN
16	Ability to develop platform like sparrow to suits progress that provides learning mode	3.12	.696	3.10	.700	3.11	HN
Cluster mean		3.25	.6569	3.19	.7658	3.22	HN

Source:(Field work 2025)

Key:

$N_E = 49$

$N_N = 21$

The descriptive statistics presented in table 2 indicated that all the items of the variable on integrative pedagogical practice of experienced and novice lecturers having a mean score of above 2.50. The inter-items mean scores of pedagogical practices needs of lecturers in integrative pedagogical practice on utilizing technology tools in teaching electronic devices having mean ranging from 2.99 to 3.39. The cluster grand mean of experienced lecturers is 3.25 with standard deviation of .6569. And the grand mean of novice lecturers also indicates 3.19 with standard deviation of .7658. The overall grand mean averages of all items is 3.22. The result indicated that the needs of experienced and novice lecturers on pedagogical practice on utilizing ICTs is highly needed pedagogical (HN) with all the items.

Research question Two

What are elect/elect lecturer needs in reflective pedagogical practice on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria?

Table 3: Descriptive Statistics of reflective pedagogical practice needs of elect/elect lecturers on utilizing technology tools in teaching electronic devices in North-East, Nigeria.

S/N	ITEMS STATEMENT	X_E	SD_E	X_N	SD_N	X_G	Remark
1.	<u>Ensure process of observation and self-evaluation to enhances practical app in electronic devices</u>	3.33	.625	3.33	.577	3.33	<u>HN</u>
2	<u>Ability to consider ICT tools in promoting engagement of students in electronic devices</u>	3.45	.647	3.33	.658	3.39	<u>HN</u>
3.	<u>Able to provide feedback mechanism through ICTs to enhance reflections teaching</u>	3.20	.676	3.33	.658	3.27	<u>HN</u>

4.	<u>Ability to support assessment methods in using ICTs recourse for electronic devices</u>	3.27	.730	3.10	.625	3.19	<u>HN</u>
5.	<u>Ability to use ICT tools to encourages needs in electronic students to reflect on learning</u>	3.14	.736	3.14	.727	3.14	<u>HN</u>
6.	<u>Ensure inclusive in use of technology to support a varied student's demographic</u>	3.20	.707	3.14	.655	3.17	<u>HN</u>
7.	<u>Explores role of lecturers as a coach-students for reflective practice in electronic devices</u>	2.90	.714	3.43	.598	3.17	<u>HN</u>
8.	<u>Ability to reflect on how ICT simulating practical scenarios for deeper understanding</u>	3.16	.657	3.43	.598	3.30	<u>HN</u>
9.	<u>Ability to reflect on the ethical use of ICT tools in teaching electronic devices</u>	3.12	.754	3.33	.658	3.23	<u>HN</u>
10	<u>Use of ICT to consider the impact of personal growth on teaching effectiveness</u>	3.04	.889	3.38	.669	3.21	<u>HN</u>
11	<u>Utilize ICT tools to provide a bridge between theoretical and real-world application</u>	3.22	.685	3.52	.680	3.37	<u>HN</u>
12	<u>Utilize ICT tools to changes in curriculum emerging trends in electronic devices</u>	3.22	.743	3.05	1.02 4	3.14	<u>HN</u>
13	<u>Focused reflection teaching approach to self-efficacy among students in electronic devices</u>	3.12	.696	3.29	.717	3.21	<u>HN</u>
14	<u>Ability to reflect on needs for practical development with ICT tools in methodology</u>	3.08	.786	3.24	.700	3.16	<u>HN</u>
Cluster Mean		3.18	.7175	3.28	.6817	3.23	HN

KeyN_E: = 49N_N: = 21

Source: Field work (2025).

The output of descriptive statistics presented in table 3 indicated that all the items of the variable on reflective pedagogical practice of experienced and novice lecturers having a mean score of above 2.50. The inter-items mean scores of pedagogical practices needs of lecturers in reflective pedagogical practice on utilizing technology tools in teaching electronic devices are ranging mean from 3.14 to 3.39. The cluster grand mean of experienced lecturers is 3.18 with standard deviation of .7175. And the cluster grand mean of novice lecturers also indicates 3.28 with standard deviation of .6817. The overall grand mean averages all items in reflective approach is 3.23. The result indicated that the needs of experienced and novice lecturers in reflective pedagogical practice is highly needed pedagogical (HN) with the items.

Test of Hypothesis One

H₀₁: There is no significant difference in between the mean responses of experienced and novice elect/elect lecturers need in integrative pedagogical practice on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Table 4: Independent T-test analysis of the mean responses of experienced and novice elect/elect lecturers integrative pedagogical practice needs on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Variables	N	X	SD	Df	t-value	p-value	Decision
Experienced Lecturers	49	3.25	.6569				
				68	.891	.380	Accepted
Novice Lecturers	21	3.19	.7658				

The statistical evidence documented in table 4; indicated that the difference between experienced and novice lecturers in integrative approach on pedagogical practice needs for utilizing technology tools in teaching electronic devices NCE awarding institutions in North-East Nigeria is significant as; df is 68, t-calculated value was .891, p-value .380. This result is quite prediction in hypothesis four (1) that there no is significant difference between the pedagogical practice need of experienced lecturers and novice lecturers for utilization of technology tools in teaching electronic devices in NCE awarding institutions in North-East Nigeria. This implies that the confident level is less than the p-value, and the null hypothesis was accepted as statistically significant.

Test of Hypothesis Two

H₀₂: There is no significant difference in between the mean responses of experienced and novice elect/elect lecturers in reflective pedagogical practice on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Table 5: Independent T-test analysis of mean responses of experienced and novice elect/elect lecturers in reflective pedagogical practice needs on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Variables	N	X	SD	Df	t-value	p-value	Decision
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Experienced Lecturers	49	3.18	.7175				
				68	-2.230	.035	Accepted
Novice Lecturers	21	3.29	.6817				

The statistical evidence documented in table 5; indicated that the difference between experienced and novice lecturers in reflective approach for utilizing technology tools in on pedagogical practice needs in teaching electronic devices in NCE awarding institutions in North-East Nigeria is significant as; df is 68 and the t-calculated value was -2.230, while, p- value is equal to .035. This result is quite prediction in null hypothesis two (2) that there is no significant difference between the pedagogical practice needs of experienced and novice lecturers on utilization of technology tools in teaching electronic devices in NCE awarding institutions in North-East Nigeria. Hence, the null hypothesis was accepted.

Findings of the study

The following are the findings of this study:

Lecturers are highly pedagogical needs in integrative pedagogical practice on utilization of technology tools in teaching electronic devices.

1. Hypothesis (H_{01}) was upheld and which means there is no significant difference in between the mean responses of experienced and novice lecturers on utilization of technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

In other hand, in finding two (2) of the study also shows highly needed in reflective pedagogical practice in teaching electronic devices in utilizing technology devices on pedagogical practice in NCE awarding institutions in North-East, Nigeria.

2. The null hypothesis (H_{02}) was also accepted; implicitly, there is no significant difference in between the mean responses of experienced and novice lecturers on the pedagogical practice needs in reflective pedagogical practice on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Discussion of Findings

The finding one (1) of the study indicates that the pedagogical practice in integrative pedagogical practice highly needed on utilization of technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria. These lecturers need capacity building in developing their competencies in all items in utilizing integrative pedagogical practice in teaching electronic devices. The finding is in support with that of Olafare, Lawrence and Fakorede, (2017), who ascertained that the quality of lecturers in n Nigerian Technical and Vocational Education and Training (TVET) Institutions high, but there are adequate challenges in utilization for teaching electronic. In same vein lecturers are in needs to used technology tools for pedagogical practice in integrative pedagogical practice but there have been challenges inhibiting the successful use of tools as a pedagogical approach in the teaching of electronic devices. This finding corroborates the views of Abubakar, that these challenges include lack of institutional ICT policy and curricular that focuses on ICTs usage as an educational tool among others: technology tools enable lecturers/teachers to have greater control over their lesson preparation and delivery through the use of simulation software's, to try abstract concept more concrete to students understanding and adverse impact on students ethics. The study was Significant in nature as encourages pedagogical practice in technology

devices for teaching electronic devices in NCE awarding institutions with in Nigeria.

The findings (2) also revealed that lecturers had a strong desire in reflective pedagogical practice on utilization of technology tools in teaching electronic devices; the finding of this study was in agreement with the findings of Babate and Jakwa (2021) which indicates that lecturers had a strong desire to adopt the utilization of ICT; but encountered barriers such as lack of confidence, competence, and lack of access to technical assistance on new emerging technology. This finding also highlights the importance of embracing pedagogical practice approaches for teaching electronic devices and encourages other electronic courses in NCE awarding institutions in Nigeria.

The statistical analysis of H_{01} , indicated that the electrical and electronic lecturers needs on pedagogical practice was quite prediction in hypothesis that there no is significant difference between the mean responses of the experienced and novice lecturers in integrative pedagogical practice on utilization of technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria. This implies that the confident level is less than the p-value, and the null hypothesis was accepted as statistically significant.

The statistical evidence documented in H_{02} , indicated that the difference between experienced and novice lecturers in reflective pedagogical practice needs on utilizing technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria is also significant. This was as a result of the t- value is slightly greater than the p-critical level of significance. The result implies quite in prediction in null hypothesis that there is no significant difference between the pedagogical practice needs of experienced and novice lecturers on utilization of technology tools in teaching electronic devices in NCE awarding institutions in North-East, Nigeria.

Conclusion

This study investigated the pedagogical practice needs of lecturers concerning the use of technology tools in teaching electronic devices across NCE-awarding institutions in North-East Nigeria. Findings revealed that while there is a general awareness of technological tools among lecturers, their integration into pedagogical practices remains significantly limited. Key barriers identified include inadequate training, insufficient infrastructure, low institutional support, and lack of continuous professional development.

The study also found variations in the level of technology integration and pedagogical adaptation among institutions and individual lecturers, highlighting the need for tailored interventions. Despite these challenges, there is a high level of interest and willingness among lecturers to adopt modern technology tools, provided adequate support and training are available.

Recommendations

Based on the findings of the study, the following recommendations are made:

Regular workshops and training sessions should be organized to enhance lecturers' competencies in using technology tools for teaching electronic devices. These should focus on both pedagogical strategies and hands-on skills.

Institutions must invest in modern teaching tools such as interactive whiteboards, simulation software, virtual labs, and internet facilities to create an enabling environment for technology-driven teaching.

The curriculum for electronic devices at the NCE level should be reviewed to include clear guidelines on technology integration in pedagogical practices.

Management should develop and implement policies that promote the use of technology in teaching. This includes setting up ICT support units, providing incentives for tech-savvy teaching, and ensuring regular maintenance of technological tools.

Electrical/electronic technology lecturers in NCE awarding institutions should actively embrace the ongoing changes in recognizing the importance of pedagogical practice for utilization of digital technology incorporating it into their teaching approaches.

Additional support in terms of problem-based and project-based teaching to collaborate with industry, partner with technology companies to access the latest ICT tools and innovations. Facilitate guest lectures, internships, and practical sessions using industry-standard software and hardware.

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