



Laboratory facilities in enhancing Teaching and Learning in Electrical and Electronics Trade in Technical Colleges in Ondo State, Nigeria.

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Article History

Received: 01/08/2024

Accepted: 08/08/2024

Published: 10/08/2024

Vol – 2 Issue – 8

PP: - 01-09

Abstract

This research analyzed the impact of laboratory facilities in enhancing teaching and learning in Electrical and Electronics Trade in Technical Colleges Ondo State. The objectives were to examine the availability of laboratory facilities for electrical and electronic trades, assess the presence of qualified teachers, evaluate the effect of laboratory facilities on student performance, and investigate the utilization of these facilities. Findings revealed a shortage of laboratory facilities, hindering effective teaching and learning. While some schools had sufficient qualified teachers, others did not, with an approximate ratio of 1:1. Respondents indicated that available laboratory materials would be used if provided, suggesting that their proper utilization would enhance student performance. The study involved 907 students and 181 teachers from five government technical colleges, with a sample of 125 respondents (100 students and 25 teachers). Data was collected using a validated and reliable structured questionnaire, yielding a reliability coefficient of 0.85 via Pearson's Product Moment Correlation. The study recommended that school management should provide adequate facilities and qualified teachers, limit student admissions to the capacity of available laboratory facilities, and ensure practical competence during teacher recruitment to improve the quality of teaching and student performance.

CHAPTER ONE

Background to the study

Laboratory facilities are materials/resources that can be used to case, encourage, improve, and promote teaching and learning activities in the technical colleges. They are materials/resources that a technical teachers or technology uses to pass information to the learners. According to Anyadiegwu, (2018), laboratory facilities are various forms of educational materials that teachers and learners can use to enhance understanding of concepts, skills, and competencies in the teaching-learning process. These facilities communicate explicitly to clarify concept, knowledge and facilitate understanding for learners. Enderle and Leeanne (2016) opine that laboratory facilities are tools used in educational lessons to promote active learning and assessment. Achimugu (2012) added that any resource a teacher uses to help him teach the learner is an instructional material. Laboratory facilities therefore enable good grasp of technical subjects. Udoh (2015) opines that good teachers seek for more effective and efficient ways of teaching since the emphasis of teaching is to get the students to understand, comprehend, and apply the concepts taught. This has continued to drive researchers towards finding different facilities and resources to facilitate the teaching and learning of electrical and electronic trades in

order to make it interesting and instructive for the learners. Enderle and Leeanne (2016) added that facilities promote hands-on and interactive laboratory experience. Laboratory materials also support technical effectiveness, learning experience and enable the student to get the best out of it. Good laboratory materials stimulate and engage students' learning at different levels, challenging them mentally and physically and the role of a technical teacher is to aid the students come to their own understanding using appropriate facilities. According to Adeniyi (2011), the use of laboratory facilities/ materials help teachers create value in teaching by reducing abstraction. Laboratory facilities make learning relevant to the learners as it offer experiences to stimulate self-activities that provide concrete basis for conceptual, logical, and critical thinking if appropriately employed. Good-quality facilities can engage students, help them to develop important skills, understand the process of scientific investigation, and develop their understanding of concepts. Based on these advantages, laboratory facilities are important and crucial tools in making learning productively relevant to its learners since the users understand a concept without difficulty. Adequate laboratory facilities are therefore needed in technical colleges to reduce the burden of teachers and to promote sensory receptors of the learners on abstract concepts. Adebisi, Tewogbade, and Olajide (2017) studied the



assessment of laboratory facilities and their findings about laboratory facilities are that laboratory facilities help to improve process skills by expanding the basis of inference and the ability to access large data base to activate learning. Mucai (2013) observes that there is lack of relevant laboratory facilities that are appropriate and suitable to Nigerian schools but are not available and poor funding is listed among the factors that hinder the availability of laboratory facilities in schools. A good system of education in any country must be effective on two fronts: First, the quantitative level is used to ensure access to education and quality in distribution and allocation of resources to various segments of the society, and second, on the qualitative level to ensure that the country produces the skills needed for rapid social and economic development (United Republic of Tanzania, 1995). The development of Universal Primary Education (UPE) in Sub-Saharan Africa (SSA) has drawn widespread international support because of its perceived role in poverty reduction (United Nations 2008). Various studies have been conducted on the problem relating to vocational education delivery in Ondo state technical colleges, in which availability and use of laboratories is highlighted (Chonjo, Osaki, Posi & Mrutu, 2006; Mafumiko, 2005; Chonjo & Welford 2001; Richard 2005, Kibga, 2004). These studies established that among the problems associated with vocational education delivery are lack of resources such as laboratories, equipment, inadequate teachers, and inadequacy of technical support in laboratory-based teaching. This may cause the college not to properly play the role of delivering vocational education. Vocational teaching requires special approach in laboratories instruction skills, management skills, and laboratory procedures such as handling of tools and repair of equipment. Furthermore, Kibga (2005) found that practical classes had no preliminary preparation done. Since the examination of technical subjects currently consists of two papers namely Paper 1 (theory-oriented) and Paper 2 (practical), how these practical examinations can be done during exams as well as the teaching and learning process if laboratories are absent remains a question with no clear answer. There is a direct relationship between the availability and use of laboratories in schools on the one hand and the performance in technical subjects' examinations on the other. The performance in vocational subjects in different senatorial unit of Ondo state is dismal compared to those schools that have been around for a long time. In this study the main focus is to investigate whether the availability or in-availability of laboratories in technical colleges of Ondo state has any link with the academic performance. Shortage of laboratories equipment in technical colleges of Ondo state has been increasingly recognized as an important barrier in improving the quality of vocational education in Ondo state (Ndabise, 2008). In Southern New Jersey, Turano (2005) found that the performance of students decreased whenever classrooms were minimal. The study discussed the learning process of students and how it is affected by the physical environment, noting that the classroom environment just like instructional management and teaching efficiency affected students' learning process. Suleiman and Hussain (2014) put more emphasis on a creative

physical arrangement of the classroom noting that this would facilitate delivery of instruction as well as enhance the learning process. A study by Ambogo (2012) supports the above point of view and states that a good learning environment is one in which sufficient coherence is made between the supply and distribution of resources, buildings, and equipment. A study by Akomolafe and Adesua (2016) in West Nigeria on the influence of physical facilities (workshops) affected levels of motivation and academic performance of students in senior secondary schools found that there is a significant relationship between physical facilities and the level of student's motivation and academic performance. The study recommended an increase of fund and budgetary allocations towards making physical facilities in institutions more learner-friendly, noting that a school's physical facilities can motivate students towards learning. Oduyemi (2000) classified physical facilities within learning institutions into two groups; permanent and semi-permanent structures. The study went further to give examples of physical facilities as laboratory equipment, teacher tools, and teaching aids among others. Both studies noted that physical facilities are likely to motivate students towards learning. Another study conducted by Onyene (2007) in Nigeria, found that the training of skill-oriented graduates for the labor market was severely limited by available physical and material resources used in teaching at technical colleges. Another researcher, still in Nigeria Ayua (2006) in a study on consolidating and sustaining the industrial performance of school product in technical vocational training institutes aimed for national development unveiled that the availability of teaching equipment and material resources was wanting as there were no standard workshops with adequate facilities. A look at other studies in Nigeria revealed as follows, Audu (2013) affirmed that TVET educators decry the poor state of workshops and laboratory equipment within TVET institutions in the country. Umar and Maaji (2010) noted that the majority of TVET institutions in Nigeria are performing below expectation due to inadequate laboratory facilities, which pose a challenge to skill acquisition by TVET students. Udofia (2012) supported this finding stating that the availability of laboratory facilities significantly impacted the acquisition of skills by students. Chukwumaijem (2015) in a study on the quality of TVET programs and improvement strategies noted that the challenge facing quality skill acquisition within TVET institutions was poor funding and inadequate facilities. Alimi. et.al (2012) facilities within learning institutions were the main factor in boosting student academic achievements. The study listed classrooms, libraries, recreational equipment, and other school buildings as examples of facilities. This study is backed up by Akomolafe and Adesua (2016) which indicated that students had more interest in learning and performed better in those institutions with good physical facilities. In Nigeria, Audu (2013) gives evidence that one of the problems of great disagreement among TVET lecturers is the issue of the inadequate and poor state of workshop tools and equipment in TVET colleges. Umar and Ma'aji (2010) in their article said that most of the TVET colleges in Nigeria have been forced to

perform below-set standards due to non-availability of workshop tools and equipment, poor leadership in the governance structure, or complete neglect of the needed facilities in the laboratories for the students to acquire effective skills needed for employment on the industries. Therefore, availing of enough laboratory tools, equipment, and machines are paramount for the effective execution of TVET courses in any nation included. Udofia et.al.(2012) agrees with Umar &Ma’aji (2010) by stating that there is a substantial linkage between laboratory equipment for training and attainment of employable skills. According to the research done by Dasmani (2011), TVET colleges operating in Ghana suffer from a lack of provision of instructional requirements and training equipment which leads to centering more on theoretical lectures leading to trainees lacking expertise in their selected field of specialization. Since TVET colleges rely mostly on training and skill acquisition, the short supply of needed facilities, materials, and equipment will have a profound negative effect on practical skills acquisition. In Nigeria, Muthaa et al., (2012) noted that most of the TVET institutions operate without adequate laboratory facilities and requirements, which do not have adequate training equipment.

Statement of the Problem.

The government of Ondo state took the initiative to establish Technical College’s in each of the senatorial districts of the state. This initiative resulted in an expansion of Technical colleges that had not been observed before. However, in spite of the massive expansion of technical colleges, it is not clear whether this quantitative expansion was associated with the provision of adequate facilities, including laboratories. Although there are some criteria established for technical schools to be registered, such as availability of laboratories, among others, the availability and use of laboratory facilities in technical colleges does not seem to have been in accordance to lay down guidelines. Also, it appears that the inadequate laboratory facilities affected the student practical in trade subject. Such a scenario cause the need for this study “Impact of laboratory facilities in Enhancing Teaching and learning of Electrical and Electronic Trade in Technical Colleges in Ondo State.

Purpose of the study

The purpose of the study is to determine the effect of laboratory facilities for effective teaching and learning electrical trades in technical colleges in Ondo state Nigeria. Specifically, the study tends to find out the:

1. Availability of laboratory facilities for teaching and learning of electrical and electronic trade in technical colleges in ondo state
2. Availability of qualified teachers in technical colleges in Ondo state
3. Effect of laboratories facilities on student performance in teaching and learning of electrical and electronics trades in technical colleges in Ondo state
4. Utilization of the available facilities for effective teaching and learning of electrical and electronics trades in technical colleges in Ondo state

Research Questions

1. What are the available laboratories facilities available for teaching and learning electrical and electronics in technical colleges in Ondo state?
2. How many qualified trades teachers are available for teaching and learning of electrical and electronics trades in technical colleges in ondo state?
3. What are the effects of laboratories facilities on student performance in electrical and electronics trades in Ondo state
4. What are the extent of utilization of the available facilities for effective teaching and learning of electrical and electronics trades in ondo state,

Methodologies

A descriptive survey research design was adopted for this study. The descriptive survey research design is used to describe features of a population or phenomenon being studied, it does not answer questions about how, why, or when the features occurred rather, it addresses the situation being studied (Shields, Patricia & Rangarajan, 2013). This design was considered suitable because the opinion of a representative sample of respondents will be sought using questionnaire. The population comprises students and teachers in Government technical colleges in all the Government Technical Colleges in Ondo State, Nigeria. A total sample of One hundred and twenty-five (125) respondents were randomly selected for the study, using a multistage sampling techniques in each of the colleges, 20 students and 5 teachers in each of the Technical Colleges were selected. In all, the total numbers of the respondents considered for the study were 125 (Hundred (100) students and Twenty-five (25) teachers). The instrument to be used is a questionnaire titled “Impact of laboratory facilities for enhancing teaching and learning of electrical and electronics trades in technical colleges of Ondo-state, Nigeria’ (ATEESGTC). The instrument was designed by the researcher in order to collect data on the subject matter. The questionnaire consists of two sections, A and B. Section A contained the respondents personal data while section B focus on the main information needed to carry out in this study, and it was rated on 4 Likert scale points: Strongly Agree (SA) 4point, Agreed (A) 3point, Strongly Disagreed (SD) 2points, and Disagreed (D) 1points. To ensure the validity of the instrument, copy of the drafted questionnaire was given to the researcher’s supervisor and three other experts in V.T.E department AAUA for critical examination, verification, and make useful suggestions and corrections. The data obtained from respondents for the research questions was analyzed using descriptive statistics, such as mean and standard deviation. Any item with mean response of 1.50 and above was considered agreed while any item with mean response below 1.50 was considered disagreed.

Data Analysis

Research Question 1: What are the available laboratories facilities for enhancing teaching and learning of electrical and

electronics trade in Government Technical College in Ondo state?

Table 1: Showing the mean responses of the respondents on the available laboratory facilities for enhancing teaching and learning of electrical and electronics trade in Government Technical colleges in Ondo state.

ITEMS		S.A	A	D	S.D	Total	Mean	S.D	Remark
There is enough soldering station in conducting of practicals	F %	38 (30.4%)	31 (24.8%)	24 (19.2%)	32 (25.6%)	125 (100)	1.83	2.95	Agreed
There is enough crimping tools for conducting practicals	F %	23 (18.4%)	32 (25.6%)	39 (31.2%)	31 (24.8%)	125 (100)	1.37	1.05	Disagreed
There is enough wire stripper for conducting practicals	F %	19 (15.2%)	35 (28.0%)	58 (46.4%)	13 (10.4%)	125 (100)	1.48	0.88	Disagreed
Fish tape is available for teaching and learning of electrical and electronics trades	F %	15 (12.0%)	58 (46.4%)	22 (18.0%)	15 (12.0%)	125 (100)	1.73	0.91	Agreed
LCR meters are available for conducting practicals	F %	24 (19.2%)	38 (30.4%)	53 (42.4%)	1 (0.8%)	125 (100)	1.60	0.89	Disagreed
There is adequate multimeter for conducting practicals	F %	34 (26.5%)	49 (39.2%)	14 (11.2%)	28 (22.4%)	125 (100)	1.70	1.09	Agreed
Soldering tools are sufficient for use when conducting practicals	F %	18 (14.4%)	46 (36.8%)	45 (36.0%)	16 (12.8%)	125 (100)	1.53	0.89	Agreed
There is enough ESD protection for conducting practicals	F %	18 (14.4%)	23 (18.4%)	30 (24.0%)	54 (43.2%)	125 (100)	1.04	1.09	Disagreed
There is enough computer testers for semiconductors for conducting practicals	F %	21 (16.8%)	28 (22.4%)	38 (30.4%)	38 (30.4%)	125 (100)	1.26	1.07	Disagreed
Crimping tools are available for conducting practicals	F %	21 (16.8%)	51 (40.8%)	18 (14.4%)	35 (28.0%)	125 (100)	1.46	1.07	Agreed
Grounded Mean							1.1		
Mean							1.5		

Table 1 reveals the responses of the respondent on the availability of laboratory facilities for teaching and learning. 55.2% of the respondents agreed that there is enough soldering station in conducting of practical's in their school while 44.8% did not agree. Also only 44% of the respondents agreed that there is enough crimping tools for conducting practical while the remaining 55% did not agree. In the same vein, only 43.2% of the respondents agree that there is enough wire stripper for conducting practical; the other 56.8% disagreed, saying that the facility was not available. Furthermore, 58.4% of the respondents agreed that Fish tape is available for teaching and learning of electrical and electronics trades while 41.6% disagreed. However, 49.6% of the respondents agreed that LCR meter are available for conducting practical, while 50.4% of the respondents did not agree with the statement. In contrast, 65.7% of the respondents agreed that there is adequate multimeter for conducting practical while 34.3% disagreed. In the same vein,

51.2% of the respondents agreed that soldering tools are sufficient for use when conducting practical, while the remaining 48.8% did not agree with the statement. Surprisingly, only 32.8% of the respondents agreed that there is enough ESD protection for conducting practical in their schools while 67.2% did not agree. Likewise, only 39.2% of the respondents agreed that there is enough computers testers for semi-conductors for conducting practical while 60.8% disagreed. 57.6% of the respondents agreed that crimping tools are available for conducting practical while 42.4% did not agree.

Research Question 2: How many qualified trades teachers are available for teaching and learning of electrical and electronics trade-in Government Technical Colleges in Ondo state?



Table 2: Showing responses of respondent on the availability of qualified teachers for teaching and learning of electrical and electronics trade-in Government Technical Colleges in Ondo State

ITEMS		S.A	A	D	S.D	Total	Mean	S.D	Decision
Teachers for teaching of radio circuit are adequate	F %	35 (28.0%)	37 (29.6%)	30 (24.0%)	23 (18.4%)	125 (100)	1.67	1.08	Agreed
There is enough teachers for teaching domestic and industrial installation trades	F %	22 (17.6%)	28 (22.4%)	38 (30.4%)	38 (30.4%)	125 (100)	1.32	1.04	Disagreed
Teachers for teaching television services and repairs are enough	F %	13 (10.4%)	41 (32.8%)	19 (15.2%)	52 (41.6%)	125 (100)	1.12	1.07	Disagreed
Teachers are available for teachings of electrical windings subject.	F %	31 (24.8%)	32 (25.6%)	28 (22.4%)	34 (27.2%)	125 (100)	1.48	1.14	Agreed
Teachers are sufficient for teaching radio communications and services.	F %	27 (21.6%)	42 (33.6%)	28 (22.4%)	34 (27.2%)	125 (100)	1.65	0.94	Agreed
There is enough teacher for teaching electronic devices and circuits.	F %	32 (25.6%)	51 (40.8%)	22 (17.6%)	20 (16.0%)	125 (100)	1.76	1.01	Agreed
Adequate teachers are available for teaching battery charging and repairs.	F %	14 (11.2%)	43 (34.4%)	45 (36.0%)	23 (18.4%)	125 (100)	1.38	0.91	Disagreed
Teachers for teaching cable jointing and repairs are enough.	F %	13 (10.4%)	36 (28.8%)	26 (20.8%)	50 (40.0%)	125 (100)	1.09	1.05	Disagreed
There is enough teachers for teaching of Basic electricity.	F %	40 (32.0%)	35 (28.0%)	21 (16.8%)	29 (23.2%)	125 (100)	1.68	1.15	Agreed
Sufficient teachers are available for teaching power electronics.	F %	35 (28.0%)	49 (39.2%)	15 (12.0%)	26 (20.8%)	125 (100)	1.74	1.08	Agreed
There is adequate teachers for teaching Electrical machines.	F %	1 (0.8%)	23 (18.4%)	52 (41.6%)	38 (30.4%)	125 (100)	1.07	0.93	Disagreed
Teachers are enough for teaching electrical power generation.	F %	14 (11.2%)	45 (36.0%)	42 (33.6%)	24 (19.2%)	125 (100)	1.39	0.92	Disagreed
Grounded Mean							1.02		
Mean							1.4		

Table 2 reveals that 57.6% of the respondents agreed that teachers in teaching of radio circuit are adequate while 42.4 disagreed. Also, 40% of the respondents agreed to the statement that there are enough teachers for teaching domestic and industrial installation while 60% did not agree to the statement. Furthermore, 43.2% of the respondents agreed that teachers for teaching television services and repairs are enough, while 56.8% do not agree. Likewise, 50.4% of the respondents affirmed that teachers are available for teachings of electrical windings while 49.6% disagreed. In the same vein, 55.6% of the respondents agreed that teachers are sufficient for teaching radio communications and services while 44.4% disagreed. Majority of the respondents (66.4%) agreed that there is enough teacher for teaching electronic devices and circuits while only 33.6% disagreed. On

the contrary, 45.6% of the respondents agreed that adequate teachers are available for teaching battery charging and repairs while 54.4% disagreed. In the same vein, only 39.2% of the respondents agreed that teachers for teaching cable jointing and repairs are enough, the other 60.8% of the respondents disagreed. Furthermore, 60% of the respondents agreed that there is enough teachers for teaching of Basic electricity while 40% disagreed. Also, 67.2% of the respondents agreed that sufficient teachers are available for teaching power electronics while 32.8% disagreed. However, only 28% of the respondents agreed that there is adequate teachers for teaching Electrical machines while 72% of the respondents disagreed. Lastly, 47.2% of the respondents agreed that teachers are enough for teaching electrical power generation while 52.8% disagreed.



Research Question 3: What are the effects of laboratory facilities in teaching and learning of electrical and electronic trades in Government Technical Colleges in Ondo State?

Table 3: Showing Response of respondents on the effects of laboratory facilities in teaching and learning of electrical and electronic trades in Government Technical colleges in Ondo state.

ITEMS		S.A	A	D	S.D	Total	Mean	S.D	Decision
The quality of teaching and learning experience depends on the extent of the adequacy of laboratory facilities in technical colleges?	F %	39 (31.2%)	18 (14.4%)	33 (26.4%)	35 (28.0%)	125100	1.48	1.20	Disagreed
Adequacy of laboratory facilities for electrical and electronic trade teaching depends on the wide effectiveness of the student?	F %	51 (40.8%)	52 (41.6%)	1 (0.6%)	15 (12.0%)	125100	2.11	0.96	Agreed
The adequacy of laboratory facilities has a positive significant effect on the students' academic performance and skills acquisition in technical colleges?	F %	54 (43.2%)	37 (29.6%)	18 (14.4%)	16 (12.8%)	125100	2.03	1.04	Agreed
Availability of laboratory facilities focus on imparting skills and abilities on students which are transferable and will influence the desired outcome.	F %	30 (24.0%)	38 (30.4%)	25 (20.0%)	32 (25.6%)	125100	1.52	1.11	Agreed
Standard Mean							1.07		
Mean							1.78		

Table 3 reveals that 45.6% of the respondents agree that the quality of teaching and learning experience depends on the extent of the adequacy of laboratory facilities in technical colleges while 54.4% of the respondents disagreed. Also, 82.4% of the respondents agreed that adequacy of laboratory facilities for electrical and electronic trade teaching depends on the wide effectiveness of the student while 17.6% disagreed. In the same vein, 72.8% agreed that the adequacy of laboratory facilities has a positive significant effect on the students' academic performance and skills acquisition in technical colleges, while 27.2% did not agree with the statement. In the same vein, 54.4% of the respondents agreed that availability of laboratory facilities focus on imparting skills and abilities on students which are transferable and will influence the desired, while 45.6% of the respondents disagreed.

Research Question 4: Utilization of the available laboratory facilities in technical colleges for effective teaching and learning of electrical and electronics trade in Government Technical colleges.

Table 4: Showing the responses of respondent on the utilization of the available laboratory facilities in technical colleges for effective teaching and learning of electrical and electronics trade-in Government Technical Colleges in Ondo state.

ITEMS		S.A	A	D	S.D	Total	Mean	S.D	Decision
Laboratory facilities can be available, adequate, but not utilized during teaching?	F %	30 (24.0%)	28 (22.4%)	39 (31.2%)	28 (22.4%)	125100	1.48	1.08	Disagreed
The extent of utilization of laboratory facilities will enhance students' academic performance?	F %	48 (38.4%)	38 (30.4%)	16 (12.8%)	23 (18.4%)	125100	1.88	1.12	Agreed
Students perform significantly higher in their academics and in skill	F %	53 (42.4%)	17 (13.6%)	39 (31.2%)	16 (12.8%)	125100	1.86	1.11	Agreed

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acquisition where these facilities are utilized?									
Standard Mean							1.74		
Weighted Mean							1.10		

Table 4 reveals that 46.4% of the respondents agreed that laboratory facilities can be available, adequate, but not utilized during teaching, while 53.6% disagreed. Also, 68.8% of the respondents agreed that the extent of utilization of laboratory facilities will enhance students'academic performance, while 31.2% disagreed. In the same vein, 56.0% of the respondents agreed that Students perform significantly higher in their academics and in skill acquisition where these facilities are utilized, while 44% of the respondent disagreed. On the average, it was revealed that 57.1% of the respondents agreed that the utilization of laboratory facilities in technical colleges aids better performance of students, while 42.9% did not agree. With the aforementioned, it can be said that if laboratory materials are available and utilized properly in teaching and learning, the performance of students in the technical colleges will be positively affected.

Discussion of Findings

Research question one, which talk about what are the available laboratories facilities for enhancing teaching and learning of electrical and electronics trade in Government Technical College in Ondo state. On the average, 48.6% of the respondents agreed to the availability of laboratory facilities for conducting practical while 51.4% of the respondents do not agree. It can therefore be said that there are not enough laboratory facilities for conducting practical in the technical Colleges based on the information provided by the respondents. This is in line with the research by Etim (2004) carried out a research on the availability of laboratory facilities in technical colleges. He used Ondo state as his study area; he discovered that most of the technical colleges did not have laboratory facilities for teaching and learning of Vocational subject. He therefore concludes laboratory facilities should be made available to trigger the interest of both teachers and student towards teaching and learning. Research question two which talked about how many qualified teachers are available for teaching and learning of electrical and electronics trade. Also reveals on the average, 50% of the respondents agreed that there are qualified teachers for teaching trade and learning of electrical and electronics while 50% of the respondents disagreed. It can therefore be inferred that there are qualified teachers in some schools while there are no qualified teachers in others, there are qualified teachers for some subjects while there are no qualified teachers for others. The availability of qualified teaches can be represented in the ratio 1:1. This was in line with the work of (Nassira, 2016), which says Technical Education is a specialized course which require specialist for it delivery. (Abe, 2014) posit that teachers of each subject are not expected only to be competent but also be professional in their filed and subject matters. (Awoyemi 2002) says itis the

responsibility of teachers to ensure that learning take place. Stigler and Hiebert (2002) on the other hand, suggest that increased qualification of teachers might increase teaching effectiveness. Research question three which talk about what are the effects of laboratory facilities in teaching and learning of electrical and electronic trades in Government Technical Colleges in Ondo State. On the average, 63.8% of the respondents agreed that availability of laboratory facilities have positive effects on teaching and learning of electrical and electronic trades while 36.2% of the respondents do not agree. We can therefore infer that availability of laboratory facilities have a positive significance on the teaching and learning of electronic and electrical trades. This further implies that the teachers will find it easier to teach and students will find learning easier more impactful if there are enough laboratory facilities. This also aligned with the work of Etiubo (2008) observe that the laboratory facilites has positives impact on student performance, and increased effectiveness of educational process, and increase productivity through enhanced human capacity. Also aligned with the work of Meridian(2007), which says laboratory facilities focus on imparting skills and ability on student which are transferable and will influence the desired characteristics expected of the curriculum.

Research question four which talks about Utilization of the available laboratory facilities in technical colleges for effective teaching and learning of electrical and electronics trade in Government Technical colleges. On the average, it was revealed that 57.1% of the respondents agreed that the utilization of laboratory facilities in technical colleges aids better performance of students, while 42.9% did not agree. With the aforementioned, it can be said that if laboratory materials are available and utilized properly in teaching and learning, the performance of students in the technical colleges will be positively affected. This align with the work of Adebisi, Tewogbade, and Olajide (2011), which says laboratory facilities can be available, adequate, but not utilized during teaching and learning of electrical and electronics trades. Also align with work of Orji and Abolarin (2012) also investigated the utilization of laboratory facilities in Technical Colleges and observed that the utilization of laboratory facilities in teaching and learning of electrical and electronics trades enable learners to develop problem-solving skill, positive attitude and interest towards learning

Conclusion

In conclusion, the finding of this research has shown that there are not enough laboratory facilities in the technical colleges across Ondo State and qualified teachers are available on the average. It was concluded that the unavailability of laboratory facilities for teaching and learning



has an adverse effect on the mastery of skills as well as the academic performance of the students in the technical colleges. Also, it was revealed that if there are enough laboratory facilities, teachers will put them to use and this will enhance the academic performance of students.

Recommendations

In order to improve the standard of teaching and learning of electrical trades, as well as the performance of electrical trade students and ultimately the quality of education in this country, the following recommendations should be adopted: -

1. In order to enhance student and teachers' performance, schools should be provided with adequate laboratory facilities and qualified teachers for their fields, also, schools should only be permitted to admit only the number of students that the available laboratory facilities can cater for adequately.
2. The teachers to be employed also should be interviewed not only on the basis of the certificate presented by them but also on practical basis. They should be made to perform practicals during interview so as to ensure that they are able to guide students in the practical aspect of their field.
3. In addition, supervisors should be allocated to visit schools without prior notice at random so as to ensure that the facilities provided are being put to good use in order to enhance the quality of teaching and learning.
4. Also, universities and colleges of education which are providers of teachers for the technical colleges should be provided with enough facilities and qualified instructors in order to ensure that those who are certified are actually qualified.
5. The technical colleges bodies should also ensure that students are mandated to participate in the practical classes provided for them so as to ensure that they are well taught so as to ensure a good performance.

Reference

1. Abe, A. A. (2014). Instructional variables and students' acquisition of employable skills in vocational education in Nigerian technical colleges.
2. Achimugu, C. O. (2012). Skills training strategies to combat worst forms of child labour in the urban informal economy: Ghana country study. Marseilles, France: International Programme on the Elimination of Child Labour (IPEC).
3. Adeniyi, A. A. (2011). Methodology and instructional materials: A new approach to teaching religions in tertiary institutions in Nigeria. Ibadan: Relinks Konsults.
4. Adebisi, T. A., Tewogbade, T. A., & Olajide, S. O. (2017). Assessment of laboratory resources: Production of skill-oriented graduates for the labor market.
5. Alimi, O., Ehinola, G., & Alabi, F. (2012). School types, facilities, and academic performance of students in senior secondary schools in Ondo State, Nigeria. *International Education Studies*, 5(3), 44-50.
6. Anyadiegwu, C. O. (2018). Availability and utilization of laboratory resources in teaching and association of Nigeria. *Journal of Education and Learning*, 47(1), 126-136.
7. Awoyemi, M. O. (2008). Resource concentration, utilization and management as correlates of students' learning outcomes: A study in school quality in Oyo State (Unpublished PhD thesis). University of Ibadan.
8. Audu, R. (2014). Assessment of the teaching methods that impact the acquisition of practical skills. *Asian Social Science*, 21(1), 35-41.
9. Audu, R., Must'amal, A. H. B., Kamin, Y. B., & Saud, M. S. B. (2013). Provision of workshop tools and equipment: Necessity for technical vocational education graduates skills acquisition. In *2nd International Seminar on Quality and Affordable Education (ISQAE)* (pp. 74-75).
10. Ayua, M. T. (2006). Consolidating and sustaining industrial performance of school product in technology education for national development. In *Proceedings of the Conference Paper Presented at the Nigerian Association of Teachers of Technology (NATT)*. Lagos, Nigeria.
11. Chonjo, P. N., O-saki, K. M., & Mrutu, M. (2006). Improving science education in secondary schools: A situational analysis of selected government secondary schools in Tanzania mainland. Dar Es Salaam, Tanzania.
12. Chukwumaijen, B., et al. (2015). Towards quality TVET programs in Nigeria, challenges.
13. Udofia, E. O. (2012). An appraisal of the availability and utilization of new technological resources for science curriculum delivery in Nigerian universities. *African Research Review*, 4(2), 370-383.
14. Dasmani, S. S. (2015). The availability of school facilities and their effects on the quality of education in government primary schools of Harari Regional State and East Hararghe Zone, Ethiopia. *Middle Eastern and African Journal Research Issues*, 11(1).
15. Enderle, P. J., & Leeanne, R. B. (2016). Students' lab manual for argument-driven inquiry in chemistry.
16. Etim, O. (2001). Preparing the primary school social studies teachers. *West African Journal of Education*.
17. Etiubon, R. U. (2018). Factors affecting student performance. MPRA, Paper No. 1362.
18. Federal Republic of Nigeria. (2006). National Policy on Education (4th ed.). Lagos: NERDC Press.
19. Kibga, E. Y. K. (2005). The role of practical assessment in teaching and learning of physics in O-

- level secondary schools in Tanzania (Master's thesis). University of Dar es Salaam, Tanzania.
20. Muthaa, O. C., & Gerled, O. V. (2016). The impact of physical facilities on students' level of motivation and academic performance in senior secondary schools in South West Nigeria. *Journal of Education and Practice*, 7(4).
 21. Ndabise, L. (2004). *Methodology of educational research* (3rd ed.). New Delhi: Wishwa Prakashan Publications.
 22. Maredia, K. (2007). The influence of school size on educational planning in Nigeria. In S. Adesina (Ed.), *Introduction to educational planning in Nigeria* (pp. 223-225). Ile-Ife, Nigeria: University of Ife Press Ltd.
 23. Turano, M. (2011). Meeting the challenges of the 21st century in technical and vocational education. Presented at a National Seminar on Technical and Vocational Education in Nigeria, Abuja.
 24. Mucai, E. W. (2013). Availability and utilization of educational resources in influencing students' learning biology in Enugu North Local Government Area of Enugu State (Master's thesis). University of Nairobi, Kenya.
 25. Nassira, F. (2016). Repositioning the facilities in technical college workshop for efficiency: A case study.
 26. Ndabise, J. (2008). Access and participation in Kenya. Nairobi: Institute of Policy Analysis and Research.
 27. Oduyemi, J. (2000). Technical & vocational education and training (TVET) sector mapping in Kenya for the Dutch Schokland TVET Programme. Edukans Foundation.
 28. Onyene, F. A. (2015). Senior secondary schools curriculum: Biology for senior secondary schools. Abuja, Nigeria: NERDC Press.
 29. Obinna, C. (2012). Triangulation. In L. Given (Ed.), *The Sage Encyclopedia of Qualitative Research*. Sage Publications.
 30. Oduyemi, O. (2000, November). Meeting the challenges of the 21st century in technical and vocational education. Paper presented at the National Seminar on Technical and Vocational Education in Nigeria, Abuja.
 31. Suleiman, C., & Hussain, M. (2014). Teaching and learning of biological sciences: Experience of some Nigerian secondary schools. *Journal of Science Teaching Association of Nigeria*, 124(2), 33-47.
 32. Orji, C., & Abolarin, M. (2012). An evaluation of resources available for science teaching in secondary schools: Implications for Vision 2020. *Journal of Emerging Trends in Educational Research and Policy Studies*, 3(3), 363-366.
 33. Richard, N. M. (2015). Effects of computer simulation and charts on biology students' performance in secondary schools in Osun State, Nigeria. *Scholarly Journal of Education*, 1(2), 13-19.
 34. Stigler, A., & Hiebert, M. (2002). Production of skill-oriented graduates for the labor market: Impact of workshop utilization on trainees' skill acquisition. Project report submitted to the Department of Science Education, Godfrey Okoye University.