
ASSESSMENT OF ELECTRICAL /ELECTRONIC LABORATORY FACILITIES IN TECHNICAL COLLEGES IN KADUNA STATE, NIGERIA

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ABSTRACT

This study assessed the Electrical/Electronic facilities in Technical colleges for the attainment of MDGs. Two research questions were formulated to guide the study. Descriptive Survey research design was adopted while the area of the study was Kaduna Central. The population comprised of two Electrical Installation and Maintenance laboratories and two Radio, Television and Electronics laboratories in technical colleges situated in Kaduna Central. No sampling technique was adopted as the data on all the Electrical/Electronic facilities in Technical colleges situated in Kaduna Central was utilized for the study. The instruments for data collection for this study were two structured checklists developed by the researchers using the minimum standard requirement of National Board for Technical Education (NBTE). To establish the validity of the instruments, face and content validation of the instruments were done by three experts. The statistical tools used for analyzing the data were frequency and percentage. Findings revealed among others that only 22.5% of facilities in the electronics laboratories are adequate based on NBTE's minimum requirement; while only 9.8% (9 items) of the facilities in the electrical laboratories are adequate based on NBTE's minimum requirement. Based on these findings, six (6) recommendations were proffered, amongst which stated that Federal, State and Local Government should ensure prompt provision of adequate laboratory facilities to meet the need of trainees in technical college

INTRODUCTION

Electrical Installation/Maintenance work (EIMW) and Radio, Television /Electronic work (RTEW) are few among other trades offered in Government Technical colleges in Nigeria. The products of these programmes (EIMW and RTEW) from Technical colleges are prepared to become craftsmen and technicians. The skills they acquired qualify them for jobs in both public and private sectors of economy while the certificate obtained enabled them to further their education. Both sectors, according to Ndomi cited in Haruna (2013) require well-trained and competent technicians who can operate and maintain the available technical equipment. Some of the products of technical colleges who are opportune to further their education to the university level or its equivalent might eventually become engineers, technologists or technical teachers in their various area of

specialization. If they don't acquire requisite skills in their technical college days, their wrong action could cause loss of lives and property. Consequently, the need for adequate laboratory facilities in technical colleges for quality education and training to produce graduates that can perform competently in their chosen vocation cannot be overstressed. Since the major goal of vocational institutions is to prepare students for successful employment in the labor market (Finch & Crunkilton cited in Umar and Abdullahi, 2010), this condition can only be met through a workshop well-equipped with relevant training facilities.

Students' practical projects are essential part of the curriculum in technical colleges, but a supportive school environment is a fundamental requirement for the successful implementation of curriculum (Bybee & Loucks-Horsely cited in Umar and Abdullahi, 2010). This aspect of curriculum can only be

implemented where facilities in the workshop are adequate and relevant. Availability of facilities enhances students learning by allowing them to be involved in demonstrations and practice that will continue to build their skills and prepare them for the world of work. However most of the technical colleges in Nigeria have been forced to perform below standard due to non-availability, poor management or utter neglect of the required facilities in the workshops for effective training (Umar and Abdullahi, 2010).

Performance at the National Technical Certificate (NTC)/National Business Certificate (NBC) examination taken in technical Colleges in November/December 2010/2011 and May/June 2012/2013 revealed very disturbing statistics attributable to utter neglect, poor funding, and inadequacy of resources. Poor management of facilities might have resulted in failure rates of 66.69% in November/December 2010/2011 NTC/NBC Examination and 76.5% in 2012/2013 May/June Examination (Aworanti, 2010 and Aworanti, 2013). Due to inadequate funding, normal workshop practice which forms 60 percent [Standard set by National Board for Technical Education (NBTE)] of the technical college curriculum is fast disappearing on vocational/ Technical colleges' time table (Atsumbe, 2002).

Ideally school workshop should be replica of the real working situation as obtained on the field. However, the provisions of laboratory/workshop facilities have not kept pace with the emergence of latest technology and students' proliferation in Technical colleges. Towe as cited in Haruna (2013) maintained that these workshop were originally designed and built for small population of students, especially in urban schools, the population has increased tremendously, thereby over-stressing the available space and facilities. To worsen the situation, Puyate as cited in Umar and Abdullahi, (2010) maintained that the present state of vocational education facilities is very poor; there is little or no concern on the part of government, teachers and

students for the improvement of the present state of facilities. This pathetic situation needs to be reverted in order to meet the millennium development goals (MDGs) in Nigeria. According to Federal Republic of Nigeria [FRN] (2004) the goals of Technical Education is to provide trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical levels, provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development; to give training and impart the necessary skills to individuals who shall be self-reliant economically. However, these objectives has not been attained in Nigeria due to some problems amongst which include the deplorable state of training facilities in the Technical Colleges in Nigeria (Haruna, 2013).

The relevance of Technical and Vocational Education (TVE) to the attainment of the MDGs is enormous because the philosophy, goals and objectives of TVE seems to be in line to some extent with the major task of MDGs which in a nutshell is to alleviate poverty and reduce the existing gap between the poor and the rich, and in line with the above, Usoro, Williams, and Otu (2012) stressed that TVE is a comprehensive programme of education embracing eight service areas which break down into over one thousand careers, it is capable of training skilled manpower in those careers for the attainment of MDGs for sustainable national development. Its philosophy, goals and objectives appear to subsume most of the MDGs in favor of poverty alleviation, health improvement, entrepreneurship development and prosperous living for all (Usoro, Williams, and Otu, 2012). TVE as an instrument for promoting environmentally sound sustainable development is an essential tool for translating the objectives of the MDGs into reality (Salihu and Musa, 2008). Consequently, this study is set to assess Electrical/Electronic facilities in Technical colleges in Kaduna Central district with the aim of highlighting its implication for the attainment of MDGs in Nigeria.

Statement of the Problem

The issue of assessment of electrical and electronics laboratories facilities in technical college has been discussed at various level nationally and internationally the most controversial has been lack of adequate laboratory facilities and lack of funding. In view of the above, Atsumbe (2002) observed that due to inadequate funding, normal workshop practice which forms 60 percent [Standard set by National Board for Technical Education (NBTE)] of the technical college curriculum has fast disappeared on vocational/Technical colleges' time table. And as a result, the problem is fast affecting the aim and objectives of the national policy on education in Nigeria as well the millennium development goals (MDGs). Furthermore, Mohammed (2011) said it is unfortunate to note that management of workshop facilities for mechanical and metalwork, building technology, woodwork technology, and electrical/electronic technology in learning institutions today leaves a lot to be desired. The problem has led to the creation of skill gap in the production sector of our economy, in support of the above Wellington cited in Cornelius (2012) was alarmed by numbers of complaints from industries that new recruits from schools sometimes do not have the basic skills to do the job. Consequently, the unemployable state of these set of people could land them in poverty which is detrimental to the attainment of MDGs point one which target eradication of extreme poverty and hunger (Federal Government of Nigeria [FGN], 2006). Lack of adequate skills on the part of these technical school products could also deter them from contributing their quota towards attainment of MDGs point seven which targets environmentally sound sustainable development. Therefore, this study is set to assess the Electrical/Electronic facilities in Technical colleges situated in Kaduna Central district of Kaduna State with the aim of pointing out its implication for the attainment of MDGs in Nigeria.

Purpose of the Study

The purpose of this study was to assess the Electrical/Electronic facilities in Technical colleges in Kaduna Central district of Kaduna State. Specifically, the study sought to:

1. Determine the adequacy of laboratory facilities in electrical installation and maintenance laboratories in Technical Colleges in Kaduna Central district of Kaduna State for the attainment of MDGs.
2. Determine the adequacy of facilities in electronic laboratories in Technical Colleges in Kaduna Central district of Kaduna State for the attainment of MDGs.

Research Questions

The following research questions were posed to guide the study:

1. What is the adequacy level are the facilities in Electrical Installation and Maintenance Work laboratories in Technical Colleges in Kaduna Central district of Kaduna State for the attainment of MDGs?
2. What is the adequacy level are the facilities in electronics laboratories in Technical Colleges in Kaduna Central district of Kaduna State for the attainment of MDGs?

METHODOLOGY

The study adopted descriptive survey research design. It was considered appropriate for collecting, analyzing and interpreting data for assessing Electrical/Electronics laboratories facilities in technical colleges in Kaduna central district of Kaduna state. This is in line with the basic purposes of descriptive survey research which according to Mmaduakonam (2004) are to collect detailed factual information that describes the nature of existing conditions; identifying problems or justifying current conditions and practices; making comparison and

evaluation of existing conditions; and to determine what others are doing with similar problems or situation and benefit from their experiences in making future plans and decisions. The geographical area of the study was Kaduna Central district of Kaduna state. The district has two Technical Colleges, viz: Government Technical College Malali; and Government Technical College Kajuru. The population comprises of two Electrical Installation and Maintenance laboratories and two Radio, Television and Electronic laboratories in technical colleges situated in Kaduna central district of Kaduna state. No sampling technique was adopted as the entire district was utilized for the study. The instruments for data collection were two structured checklists adapted by the researchers from the minimum standard requirement of National Board for Technical Education (NBTE). The first checklist containing 92 items was intended to collect data for Electrical laboratory facilities while the second checklist containing 71 items was intended to collect data regarding Electronics laboratory facilities. To establish the validity of the instruments, face and content validation of the instruments were done by three experts (one from Department of Education [Technical] Kaduna Polytechnic; and two from NBTE, Kaduna). No reliability test was conducted as the items were drawn from the minimum standard requirement of NBTE. The instruments were administered personally by the researchers with the help of four research assistants. The statistical tools used for analyzing the data were frequency and percentage. Frequency and percentage were considered suitable for the study due to the nature of the data involved. Decisions on research questions 1 and 2 were based on the following viz:

Where the quantity of facilities available (QA) in the laboratory is greater than 100% of the minimum quantity required (MQR) (i.e. If $QA > MQR$), the facilities was considered to be very adequate.

Where the minimum quantity of laboratory facilities required (MQR) is equal to the Quantity

Available (100%) in the laboratory, the facilities was considered to be adequate (i.e. If $MQR = QA$, then it is adequate).

In a situation where the quantity of laboratory facilities available (QA) is between 75% and 99% of the minimum Quantity required (MQR), the facilities were considered to be fairly adequate.

Where the quantity of laboratory facilities available (QA) falls between 50% and 74% of the minimum Quantity required (MQR), the facilities were considered to be inadequate.

Where the quantity of laboratory facilities available (QA) falls between 1% and 49% of the minimum Quantity required (MQR), the facilities were considered to be very inadequate.

And in a situation where the quantity of laboratory facilities available (QA) is 0% of the minimum Quantity required (MQR), the facilities was considered to be not available.

Analyses were done according to research questions that guided the study as follows:

RESULTS

Research Question 1

1 What is the adequacy level are the facilities in Electrical Installation and Maintenance work laboratories in Kaduna Central district of Kaduna State?

The results of data analysis in Table 1 revealed that out of the whole 92 items, only 9 items (1, 11, 18, 45, 46, 55, 57, 62 and 78) were considered adequate based on the NBTE minimum standard requirement. This means that only 9.8% of the facilities in the electrical laboratories are adequate while 81.2% (83 items) are inadequate. Consequently, this implies that the available laboratory facilities in the technical colleges are in short supply for the training of electrical/electronic students.

Table 1: Adequacy of Electrical Installation and Maintenance Works laboratories in Technical colleges for the attainment of MDGs

S/N	Items	Minimum Quantity Required	Quantity available (Frequency)	% Available	Remark
1.	Work benches	10	10	100	A
2.	Crow bar	4	1	25	IA
3.	Conduct bending machine	4	1	25	IA
4.	Stock and dies	2	1	50	IA
5.	Clamps	5	None	0	NA
6.	Winding machine	2	None	0	NA
7.	Battery charger	2	1	50	IA
8.	Wiring machine	35	27	77.1	FA
9.	Oils	5	None	0	NA
10.	Grease gun	3	None	0	NA
11.	Ladder (adjustable)	4	4	100	A
12.	Blow lamp	6	3	50	IA
13.	Pot and ladle	4	2	50	IA
14.	Goggles	10	2	20	IA
15.	Scaffolding	10	None	0	NA
16.	Electric soldering iron	20	10	50	IA
17.	Soldering bit	10	5	50	IA
18.	Welding machine	1	2	200	VA
19.	Hand gloves	5	2	40	IA
20.	Helmet	10	None	0	NA
21.	Safety belt	5	None	0	NA
22.	Overall uniform	5	3	60	IA

23.	Fractional distillation sets	5	None	0	NA
24.	Boots	4	None	0	NA
25.	AC and DC Ammeter	35	10	28.6	IA
26.	AC and DC voltmeter	35	12	34.3	IA
27.	AC and DC a voltmeter	20	3	15	IA
28.	Wattmeter	10	4	40	IA
29.	Megger	5	2	40	Inadequate
30.	Tachometer	5	2	40	VIA
31.	Energy meter	5	None	0	NA
32.	Neon tester, voltage	20	None	0	NA
33.	Steel rule	20	2	10	IA
34.	Oscilloscope	2	1	50	IA
35.	Hydrometer	5	4	80	FA
36.	Ohmmeter	10	5	50	IA
37.	Spirit level	35	None	0	VIA
38.	Micrometer	30	2	6.7	IA
39.	Growler	5	1	20	IA
40.	Bridge megger	5	None	0	NA
41.	Measuring tape	10	2	20	IA
42.	Signal generator	2	None	0	NA
43.	Screwdriver set flat (small)	20 sets	10 sets	50	IA
44.	Screwdriver set flat (medium)	20 sets	10 sets	50	IA

	m)				
45.	Screw driver set flat (large)	5 sets	10 sets	200	VA
46.	Allen keys	5 sets	10 sets	200	VA
47.	Stripper s	20 sets	10 sets	50	VIA
48.	Long nose plier	20	10	50	VIA
49.	Combination plier	20	5	25	VIA
50.	Cutter	20	10	50	VIA
51.	Hack saw blade	10 pkts	2 pkts	20	VIA
52.	Hack saw	20	3	15	VIA
53.	Hammer	40	15	37.5	VIA
54.	Mallets (rubber, wooden)	5 each	5 only	25	VIA
55.	Spanners (flat, ring and sockets)	3 sets	4sets	125	VIA
56.	Different files	35	7	20	IA
57.	Chisels (cold)	4	8	200	VA
58.	Taps, wrenches	3	1	33.3	IA
59.	Drills (manual, electrical)	4 boxes	1	25	IA
60.	Reamers	5	None	0	NA
61.	Screw extractor	2 boxes	2 pieces	10	IA
62.	Testing screw drivers	10	10	100	A
63.	Electrician knives	20	2	10	IA

64.	Raw/plug	20pkts	None	0	NA
65.	Pipe wrenches	10	None	0	NA
66.	Gimlet	20 sets	4 sets	20	IA
67.	Centre punch	20	None	0	NA
68.	Bell and battery set	20	None	0	NA
69.	Compressing tools	10	None	0	NA
70.	Scriber	10	None	0	NA
71.	Ringing tools	5	None	0	NA
72.	Tin snips	5	None	0	NA
73.	Crimping tools	5	None	0	NA
74.	Resistor	100	30	30	IA
75.	Rheostat	30	5	16.7	IA
76.	Inductors	70	10	14.3	IA
77.	Capacitor	70	20	28.6	IA
78.	Transformer (various type)	10	15	150	VA
79.	D.C motor (various types)	10	None	0	IA
80.	D.C generator	10	1	10	IA
81.	A.C motors	3	1	33.3	IA
82.	Starters	5	1	20	IA
83.	A.C generator	2	1	50	IA
84.	Lead - acid batteries	5	None	0	NA
85.	Knife batteries	5	None	0	NA
86.	Earth - loop	2	None	0	NA

	tester				
87.	Fire extinguishers	8	4	50	IA
88.	Sand buckets	8	1	12.5	IA
89.	Thermos	5	1	20	IA
90.	Relays	10	2	20	IA
91.	Water buckets	8	None	0	NA
92.	First aid box	2	None	0	Not available

Research Question 2

2. What is the adequacy level are the facilities in Radio, Television and Electronic laboratories in technical colleges in Kaduna Central district of Kaduna State?

The results in Table 2 revealed that out of the whole 71 items, only 16 items (2, 18, 19, 43, 44, 47, 48, 50, 55, 58, 59, 60, 61, 66, 67 and 68) were considered adequate. It means that only 22.5% of facilities in the electronics laboratories in technical colleges while, 77.5% (55 items) are inadequate for the training of technical college students in the study area. This implies that the available laboratory facilities in the technical colleges are inadequate for the training.

Table 2: Adequacy of Radio, Television and Electronic Laboratories in Technical Colleges for the attainment of MDGs

S/N	Items	Minimum Quantity Required (MQR)	Quantity available (Frequency) (QA)	% Available	Remark
1.	Multi-meter	15	4	26.7	VA
2.	Ammeter	15	25	166.7	VA
3.	Voltmeter	15	11	73.3	IA
4.	Wattmeter	15	None	0	NA
5.	EHT meter probe	10	None	0	NA
6.	Digital multimeter	15	5	33.3	VIA

	r				
7.	L.F Generator	10	5	50	IA
8.	R.F Generator	10	5	50	IA
9.	I.F sweep Generator	5	None	0	NA
10.	Pattern Generator	3	None	0	NA
11.	T.V Analyzer	3	1	33.3	VIA
12.	Signal tracer	3	1	33.3	VIA
13.	oscilloscope 6 MHZ BH	5	3	60	IA
14.	Frequency counter	5	None	0	NA
15.	Variable D.C power	10	3	30	VIA
16.	Variable output transformer	3	None	0	NA
17.	Loop antenna	3	2	66.7	IA
18.	Portable drilling machine	3	3	100	A
19.	Overhead projector	1	1	100	A
20.	Slide projector	1	None	0	NA
21.	16mm sound projector	1	None	0	NA
22.	VCR and its monitor	4	1	25	C
23.	Set of screwdrivers	10 sets	3 sets	30	VIA
24.	Screw drivers - flats	10 sets	3 sets	30	VIA
25.	Screwdrivers large	10 sets	3 sets	30	VIA
26.	Screwdrivers-medium	15 sets	3 sets	20	VIA
27.	Screwdrivers-small	15 sets	2 sets	13.3	VIA
28.	2 sets of spanners flat	15 sets	1 set	6.7	VIA
29.	Spanner	5 sets	4 sets	80	FA

	box				
30.	Soldering iron stand	15	None	0	NA
31.	Wire stripper	20	16	80	FA
32.	Side cutters	20	8	40	VIA
33.	Long nose pliers	35	10	28.6	VIA
34.	Trimming tools	3	None	0	NA
35.	Pliers (rubber insulated)	35	3	8.6	VIA
36.	Tweezers	35	23	65.7	IA
37.	Screws	35	None	0	VIA
38.	Electric drills	30	1	3	VIA
39.	Drill bit	10	1	10	Very inadequate
40.	Different stage offices	5	1	20	VIA
41.	Tops and windlass	3 sets	None	0	NA
42.	Dies and stocks	3 sets	None	0	NA
43.	Resistor (Assorted)	70	Over 70	400	VA
44.	Resistor variable	70	Surplus	300	VA
45.	Inductors air	35	0	0	NA
46.	Inductors magnetic core	35	10	28.6	VIA
47.	Capacitor	70	Surplus	350	VA
48.	transformer LF power	10	11	110	VA
49.	transformer H. F (AF, IF)	10	None	0	NA
50.	Switchers	100	Surplus	250	VA
51.	Plugs main, phone and din	30 each	None	0	NA
52.	Terminal tag	100	None	0	NA
53.	Copper clad board-	15	None	0	NA

	processed				
54.	Copper clad board-unprocessed	15	None	0	NA
55.	Vero sockets	14	20	143	VA
56.	ICs sockets	70	None	0	NA
57.	Photo boards	15	None	0	NA
58.	Diodes – solids state	30	Surplus	300	VA
59.	Diodes-vacuum	30	Surplus	320	VA
60.	transistor NPN/PNP	70 each	Surplus	380	VA
61.	Valves	30	Surplus	290	VA
62.	Cables/wires	4 reel each	1 coil	5	VA
63.	linear IC's	15	None	0	NA
64.	Digital IC's	15	None	0	NA
65.	Radio set	5	2	40	VIA
66.	T.V set	2	2	100	A
67.	Recorder	3	4	125	VA
68.	Amplifier set	3 set	3 set	100	A
69.	Relays	16	10	62.5	IA
70.	Rectifiers	90	6	6.7	VIA
71.	AC frequency generator	10	None	0	NA

Findings of the Study

Based on the data collected and analyzed, the main findings of the study are:

1 That only 9.8% (9 items) of the facilities in the electrical laboratories in technical colleges situated in Kaduna Central district are adequate for the training of students.

2 81.2% (83 items) are inadequate for the training technical college students in the area of study (Kaduna Central).

3 That only 22.5% of facilities in the electronic laboratories in technical colleges situated in Kaduna Central district are adequate.

4 77.5% (55 items) are inadequate for the training of technical college students in Kaduna Central.

Discussion of findings

The first finding revealed that only 9.8% (9 items) of the facilities in the electrical laboratories in technical colleges situated in Kaduna Central district are adequate in terms of NBTE's minimum requirement. This finding agreed with the finding of Abdullahi (2003) who reported that every training school faces the problem of appropriate facilities for technical and vocational training programs.

The second finding also revealed that only 22.5% of facilities in the electronic laboratories in technical colleges situated in Kaduna Central district are adequate in terms of NBTE's minimum requirement. This agrees with the finding of Haruna (2013) which stated that facilities in electrical and electronic laboratories in the technical schools are inadequate. And in relation to the above, Yaduma (2010) stressed that the types of tools and equipment in use in our Technical Vocational and Training institutions are old, obsolete and not in tune with current industrial practices. As a result there is gap between the skills acquired whilst in training and the skill needed by industry to create wealth.

The third finding shows that only 22.5% of facilities in the electronic laboratories in technical colleges situated in Kaduna Central district are adequate. This agrees with Uzoagulu (2002) who observed that in many technical training institutions (colleges, polytechnics and universities) tools and equipment are not adequately provided, while the few available ones are dilapidated and obsolete.

The fourth finding also revealed that 77.5% (55 items) are inadequate for the training of technical college students in Kaduna Central. This agrees with the finding of Lasisi (2013) which revealed inadequate provision of tools and equipment in laboratories of Government Technical Colleges in Oyo state. Consequently, it is evident that the inadequacy of

laboratory facilities in these technical colleges will deterred skill acquisition in programs run in them as well as the attainment of the Millennium Development Goals number one which targets eradication of extreme poverty and hunger; and point number seven which targets sustainable development. In view of the above, Mohammed (2011) stressed that the provision of adequate tools/equipment and replacement of obsolete ones will no doubt enhance the training of the students in the colleges.

Implication of the findings on the attainment of millennium development goals (MDGs) in Nigeria.

The findings of this study have some far reaching implication on the attainment of Millennium Development Goals (MDGs) objective number one which targets on the eradication of extreme poverty and hunger as well as MDGs points even which targets sustainable development in Nigeria. Specifically, if the problems identified from the findings of this study are allowed to linger without prompt action, it means most technical school graduates will not be equipped with marketable skills that will enable them make a living, hence this situation could lead to high level of poverty in a society, this is detrimental to the attainment of MDGs goal. Some of the technical college products who eventually graduated with only the theoretical knowledge may eventually be employed in some key sectors of the economy, their lack of adequate preparation for the realities of the world of work could deter them from contributing their quota to the economic/technological development of this nation, which is detrimental to the attainment of the MDGs goals. Unskilled personnel would also be unable to compete and partner globally; this is also detrimental to the attainment of MDGs goal number eight which targets developing a global partnership for development. However, if the recommendations of this study are implemented, it would lead to the empowerment of the TVET institutions graduates with adequate skills that will enable them move this nation

forward technologically and make a living for themselves, poverty would be reduced in the society which is the first point of the MDGs 8 point agenda, the low level, middle level and the high level manpower required to turn the nation's economy around and usher in the desired technological advancement which is very much required for the elevation of Nigeria from a "consumer nation" to a "producer nation", from a developing nation to a developed nation would be realized, thereby attaining the MDGs point seven.

CONCLUSION

The desire to produce competent graduates in technical colleges can be achieved when the facilities in the workshops are relevant and adequate for the programs as demanded by the curriculum. This study has shown that facilities in electrical and electronic laboratories of technical colleges in Kaduna Central are inadequate. Consequently, some measures for combating the problems were proffered. It is believed that prompt implementation of the recommendations of this study will tackle the problems emanating from the findings of this study, and likewise ensures the attainment of millennium development goals (MDGs) point 1 and 7 in Nigeria.

RECOMMENDATIONS

The following recommendations have been proffered based on the findings of the study:

Federal, State and Local Government should ensure prompt provision of adequate laboratory facilities to match the need of trainees in technical colleges.

Industries and other relevant stakeholders should be sought as partners in progress to assist in provision of facilities; this could be achieved through interactions as technical colleges provide industry with capable employees.

Students' laboratory fees system should be introduced in technical colleges to supplement government subvention for procurement of

Laboratory facilities. However, parent teachers association (PTA) should ensure that the students' laboratory fee fund is utilized accordingly.

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