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Assessment of Resources for Practical Skill Acquisition of Electrical Machines Repairs for Students of Technical Colleges in Rivers State

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Abstract

This study assessed the resources for practical skill acquisition of electrical machines repairs for students of technical colleges in Rivers State. To guide the study, three research questions were raised and three corresponding hypotheses were formulated. The hypotheses were tested at 0.5 significant level. The population of the study comprised all the four (4) technical colleges in the state both students and staff which gave a total population of three hundred and fifty (350) respondents. The sample size amounted to one hundred and thirty (130) persons both students and staff drawn from the two Technical Colleges. Final year (exiting) students of electrical technology were used for the study. The instrument for data Collection was a close ended questionnaire. The instrument was validated by the researchers' supervisor and two (2) other experts on measurement and evaluation from Ignatius Ajuru University of Education. To establish the level of reliability of the instrument the Cronbach-Alpha method was used and average coefficient reliability of 0.85 was obtained.. The Method of Data Analysis was carried out using mean and standard deviation while t-test statistics were used to test hypotheses. Result of Data Analysis showed that workshop equipment, infrastructure and funding were at low extent. Some recommendations have been made such as; All workshops should be well equipped with ICT facilities in all technical colleges.

Keywords: Assessment, Resources, Practical Skill, Acquisition, Electrical Machines Repairs

1. INTRODUCTION

Technical colleges are institutions which are established for the purpose of training of technical manpower, the semi-skilled, medium, and fully skilled personnel. Currently, Students are admitted for pre-vocational and vocational levels (Ogundu, 2017). Therefore, a certain percentage of time is allocated to both the theory and to the practical in order to give them all round experience. The periods allocated however is usually determined by the examining bodies, such as the National Board for Technical Education (NBTE) and the National Business and Technical Education Board as prescribed in their syllabi. So, this research is intended to assess the resources available to the public technical colleges in Rivers State to enable them achieve their goals. Since the achievement of the skills required of the students largely depends on the resources available to them. Vocational centres take shorter period of training than trade schools or technical colleges. For instance, in the United Kingdom, Technical Colleges are well equipped (Akaninwor, 2013), so much that

Degree or Higher National Diploma. Here in Nigeria the national policy on education provides for technical colleges to train technical manpower (Federal Republic Nigeria, 2013). Technical colleges admit junior secondary school leavers (Universal Basic Education Graduates) (UBE) into vocational level one. Technical colleges are perceived as the main colleges which provide technical skills at pre-vocational, vocational and semi-skilled manpower in Nigeria in all sorts of skills.

The crux of this study is electric motor repairs which is a major integral of electrical machines an electric motor therefore can be describe as an electro-mechanical device which converts electrical energy into mechanical energy. In other words, it takes electrical energy input and turns it into mechanical output. The rating of an electric motors is in Horse Power or Kilowatt (KW). Horse Power is a mechanical rating whereas the KW is an electrical rating. One (1) KW is equivalent to 100 watts of electrical power. One (10) Horse Power is equivalent to 746 watts or 0.746 Kilo-watt. Electrical motors are used for numerous applications such as electrical drills, conveyors, lifts, kernel crackers. Infact, hardly can any industry function effectively without the use of electrical motor, whether large or small. For domestic applications, the electric fan is a typical example. The vacuum cleaner, the washing and drying machines, the list is endless. Even with the domestic refrigerator is constructed to suit its place of application and capacity. It is a highly inductive equipment meaning that it draws high current in any circuit it is connected to function for this reason very large motors whether alternating current (arc) or direct current has affixed or connected a capacitor across it for power factor correction (P.F. correction) to reduce the lagging power factor, motors come in various designs and forms. Many are still being designed; however, the principle of operation remains basically the same

There are various resources that are vital for effective implementation of technical education curriculum in technical colleges. These resources if not available will pose a serious challenge to the desired level of skills required of the students. These resources in this respect include human and material resources. Human resources here include the management of the institution, the instructors and other academic and non-teaching staff such as workshop attendants. Materials resources on the other hand include infrastructural facilities and instructional facilities, buildings, conducive environment, etc; the deficiency of any of these requirements will impede the success of the objective of the establishment. While these resources are provided, it is also important that the students will be able to utilize these resources maximally. Workshop equipment provided should only be the tools and new machines but even the old and moribund ones so that students can dissemble them and use them for practice, such as disused generators and motors, electric drills etc. on regular basis which will enhance their proficiency. This is why the pre-vocational levels (1 – 3) and the UBE (1 – 3) options are very commendable. As indicated by the reports of the comparative technical education seminal abroad the general education technical subjects can also serve as a diagnostic purpose. That is, they may be useful in the identification of students' special talents and aptitudes as well as areas of weakness so that appropriate

educational and vocational guidance can be given. New national policy of education was redressed in this line

Nigeria is in dire need of medium level of technical manpower (Okoye & Onyenwe, 2016). In recognition of this fact, several technical colleges and even polytechnics have been established to bridge this gap. This is informed by the high rate of unemployment in the country, several solutions have been proffered by experts, but the problem of unemployment seems intractable. Technical and Vocational Training (TVT) is designed to alleviate this problem to a very large extent. Personal observation of the researcher has shown that some of our college graduates are not adequately qualified in terms of skills acquisition due to inadequate resources namely; workshop equipment, infrastructure, funding and ICT application. Studies carried out by Oyewu and Obanu as cited by Uket (2012), on the cause of unemployment in Nigeria indicated that most graduates of technical schools are wholly dependent on government to provide job opportunities which has increased the rate of unemployment in the country. This shows that graduates of technical colleges may be deficient of the requisite competencies to be self-reliant on graduation. It re-states the fact that skill acquisition must be emphasized in technical colleges.

Technical and vocational education can contribute greatly to the reduction of abject poverty, hunger and unemployment because it is handicapped by numerous challenges (Eze, 2013). Oranu (2004) observed that the good intentions of successive Nigerian governments about TVE programmes are still fraught with a lot of challenges.

Purpose of the Study

The purpose of this study is broadly to assess the resources (both human and material) for practical skill acquisition of electrical machines Repairs for students of Technical Collages in Rivers State. Specifically, the study seeks to Assess:

1. the extent to which Workshop equipment are available to enhance skill acquisition of electrical machines in Technical Colleges Students in Rivers State.
2. the extent to which infrastructure are available to enhance skill acquisition of electrical machines repairs for Technical Colleges Students in Rivers State.
3. the extent to which Funding is available to finance skill acquisition of electrical machines repairs for Technical Colleges Students in Rivers State.

Research Questions

The following research questions guided the study.

1. To what extent are the Workshop equipment available to enhance the skill acquisition of electrical machines repairs in technical colleges in Rivers State?
2. To what extent are the Infrastructural facilities available to enhance the skill acquisition of electrical machines repairs in technical colleges in Rivers State?
3. To what extent is the funding available to enhance the skill acquisition of

electrical machines repairs in technical colleges in Rivers State?

Hypotheses

The following research hypotheses were tested at 0.05 level of significance.

Ho_1: There is no significant difference between the mean responses of students and staff on the extent workshop equipment available to enhance the skill acquisition of electrical machines repairs in technical colleges in Rivers State.

Ho_2: There is no significant difference between the mean responses of students and staff on the extent infrastructural facilities are available to enhance the skill acquisition of electrical machines repairs in technical colleges in Rivers State.

Ho_3: There is no significant difference between the mean responses of students and staff on the extent funding available to enhance the skill acquisition of electrical machines repairs in technical colleges in Rivers State.

2. METHODOLOGY

The nature and objective of this study necessitated the use of descriptive survey study. The study was carried out in Rivers State. The population of this study comprised students and staff of the four (4) Public Technical Colleges in Rivers State of Nigeria. The entire population was a total number of 250 students and 100 staff giving a total population of 350 people. Simple random sampling techniques was used to select two technical colleges in Rivers State. Therefore, all the staff and students in the selected technical colleges were used in the study. The sample size of the study was thirty (30) staff and one hundred (100) electrical students which gave a total of one hundred and thirty (130) sample size. The instrument for this study was a structured questionnaire titled "Assessment Resources for Practical Skills Acquisition of Electrical Machines Repairs for Students in Technical Colleges (ARPSAEMRSTC)". The instrument was a self-designed one, and it was structured in a four point rating scale of Very High Extent (VHE-4), High Extent (HE-3), Low Extent (LE-2), and Very Low Extent (VLE=1). The instrument for this study was validated by two (2) experts in Technical Education. To establish the reliability of the study, Cronbach Alpha reliability was used. which yielded an average reliability index of 0.86. This shows that the instrument is reliable. The technique for the analysis of the data was mean and standard deviation. The decision was based on the mean benchmark, which was 2.50 for each of the items. Items with mean greater than or equal to 2.50 were rated high extent and less than 2.50 were rated low extent. Independent sample t-test statistical tool was used for testing the hypotheses at 0.05 level of significance.

3. RESULT

Research Question 1

To what extent are the workshop equipment adequate to enhance the skill acquisition of electrical machines repairs in technical colleges in Rivers State?

Table 1: Mean ratings of the respondents' responses on the extent workshop equipment is adequate to enhance skill acquisition of electrical machines repairs in technical colleges in Rivers State.

S/N	To what extent are the following?	Staff n=30		Students n=100		Overall n=130		Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD	
1	adequacy of electrical equipment	2.48	0.49	2.40	0.45	2.44	0.47	LE
2	electrical practical's carried out on electrical machines	2.00	0.00	2.00	0.00	2.00	0.00	LE
3	consumables for practical work provided	2.20	0.97	2.36	0.67	2.28	0.82	LE
4	electrical machines both old and new provided for practical work	2.42	0.71	2.40	0.45	2.41	0.58	LE
5	Does your college carryout practical work	2.36	0.68	2.37	0.91	2.37	0.80	LE
6	equipment regularly maintained	2.00	0.51	2.50	0.46	1.70	0.00	LE
7	students work as a team or individual	2.01	0.03	2.45	0.46	2.23	0.45	LE
8	students provide individual equipment to facilitate their studies	1.68	0.23	2.44	0.48	2.06	0.36	LE
9	workshop teachers proficient in workshop practical's	1.78	0.49	1.83	0.51	1.81	0.50	LE
10	workshop tools provided by individuals, institutions or organization	1.89	0.62	1.76	0.66	1.83	0.63	LE
	CLUSTER MEAN/SD	**2.10**	**0.40**	**2.25**	**0.44**	**2.18**	**0.42**	

Field Survey, 2021

The data analysis in table 1 shows that all the items were identified as low extent by the respondents. A grand mean of 2.18 with standard deviation of 0.42 was obtained in all the items thereby showing that the items were not adequate. The relatively low standard deviation of 0.42 showed that the respondents had similar views on all the items as were available at low extent

Research Question 2: To what extent are the infrastructural facilities adequate to enhance the skill acquisition of electrical machines repairs in technical college in Rivers State?

Table 2: Mean ratings of the respondents' responses on the extent infrastructures adequate to enhance skill acquisition of electrical machines repairs in Technical Colleges in Rivers State

S/N	To what extent are the infrastructure?	Staff n=30		Students n=100		Overall n=130		Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD	
11	buildings provided in your college	2.20	0.93	2.18	0.42	2.19	0.68	LE
12	roads in and around the environment	1.86	0.94	2.40	0.45	2.13	0.70	LE
13	good and conveniences within the environment	1.96	0.87	2.00	0.00	1.98	0.87	LE
14	electricity supply are regular	2.36	0.68	2.28	0.82	2.32	0.75	LE
15	teaching facilities are Adequate	2.40	0.45	2.00	0.00	2.20	0.45	LE
16	Health facilities	2.43	0.72	2.36	0.67	2.40	0.70	LE
17	regular supply of good water	2.01	0.77	1.88	0.65	1.95	0.71	LE
18	recreational facilities	1.89	0.62	1.76	0.66	1.83	0.64	LE
19	environment conducive for learning	1.76	0.61	1.80	0.67	1.78	0.64	LE
20	Library is adequate	2.17	0.74	1.28	0.19	1.96	0.05	LE
	CLUSTER MEAN/SD	**2.26**	**0.63**	**2.16**	**0.46**	**2.21**	**0.62**	

Field Survey, 2021; LE- Low Extent, HE- High Extent

The data analysis in table 5 shows that all the items were identified as inadequate by the respondents. A grand mean of 2.16 with standard deviation of 0.77 was obtained in all the items thereby showing that the items were not adequate. The relatively low standard deviation of 0.77 showed that the respondents had similar views on all the items were available at low extent

Research Question 3: To what extent is Funding adequate to enhance the skill acquisition of electrical machines repairs in technical colleges in Rivers State?

Table 3: Mean ratings of the respondents' responses on the extent funding is adequate to enhance skill acquisition of electrical machines repairs in Technical Colleges in Rivers State

S/N	To what extent are the following	Staff n=30		Students n=100		Overall n=130		Decision
		$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_3$	SD	
21	college funded in terms of facilities eg. Libraries	2.45	0.92	2.45	0.92	2.45	0.92	LE
22	you receive financial support from other non government institutions	2.45	0.73	2.48	0.93	2.47	0.83	LE
23	students from your college receive grants, scholarships, bursaries from government or other agencies	2.48	0.78	2.45	0.92	2.47	0.85	LE
24	college library funded	2.01	0.77	1.88	0.65	1.95	0.71	LE
25	salaries regularly paid	1.89	0.62	1.76	0.66	1.83	0.64	LE
26	students go on excursions	1.76	0.61	1.80	0.67	1.78	0.64	LE
27	employees go on regular training	2.41	0.74	2.38	0.39	2.74	0.83	LE
28	staff regularly retrained	2.84	0.87	2.54	0.95	2.67	0.85	LE
29	staff regularly promoted as at when due	2.20	0.97	2.36	0.67	2.28	0.82	LE
30	students encouraged to go on seminar	2.42	0.71	2.40	0.45	2.41	0.58	LE
	CLUSTER MEAN/SD	**2.17**	**0.74**	**2.14**	**0.79**	**2.16**	**0.77**	

Field Survey, 2021, LE- Low Extent, HE- High Extent

The data analysis in table 3 shows that all the items were identified as low extent by the respondents. A grand mean of 2.21 with standard deviation of 0.62 was obtained in all the items thereby showing that the items were not adequate. The relatively low standard deviation of 0.62 showed homogeneity in the opinions of the respondents that all the items were available at low extent

Hypotheses testing

Hypothesis 1

There is no significant difference between the mean responses of students and staff on Workshop Equipment's to enhance students skill acquisition on electrical machine repairs in Technical Colleges in Rivers State.

Table 4: t-test of mean responses of staff and students on to what extent workshop equipment's enhance students' skill acquisition of students of technical colleges in Rivers State.

Respondents	N	$\bar{X}$	SD	DF	t-cal	t-tab	P	Decision
Staff	30	2.10	0.40	128	1.76	1.96	0.05	N. S
Students	100	2.25	0.44					

The analysis in table 2 above shows that the calculated t-value at 0.05 level of significance and 128 degree of freedom for 9 items is 1.76 while the critical value is 1.96. Since the critical t-value is more than the t-calculated, the null hypothesis is therefore not significant for these items. This decision means that no significant different exists between the mean responses of staff and students on to what extent workshop equipment enhance students' skill acquisition on electrical machine repairs in Technical Colleges in Rivers State

Hypothesis 2

There is no significant difference between the mean responses of students and staff on Infrastructure to enhance students skill acquisition on electrical machine repairs in Technical Colleges in Rivers State.

Table 7: t-test of mean responses of staff and students on to what extent infrastructure enhance students' skill acquisition of students of technical colleges in Rivers State.

Respondents	N	$\bar{X}$	SD	DF	t-cal	t-tab	P	Decision
Staff	30	2.26	0.63	128	0.81	1.96	0.05	N. S
Students	100	2.16	0.46					

N. S = Not significant

The analysis in table 4 above shows that the calculated t-value at 0.05 level of significance and 128 degree of freedom for 15 items is 0.81 while the critical value is 1.96. Since the critical t-value is greater than the t-calculated, the null hypothesis is therefore not significant for these items. This decision implies that no significant difference exists between the mean responses of staff and students on to what extent infrastructures enhance students skill acquisition on electrical machine repairs in Technical Colleges in Rivers State.

Hypothesis 3

There is no significant difference between the mean responses of students and staff on the extent funding enhance students' skill acquisition on electrical machine repairs in Technical Colleges in Rivers State.

Table 8: t-test of mean responses of staff and students on the extent Funding enhance students' skill acquisition of students of technical colleges in Rivers State.

Respondents	N	$\bar{X}$	SD	DF	t-cal	t-tab	P	Decision
Staff	30	2.17	0.74	128	0.19	1.96	0.05	N. S
Students	100	2.14	0.79					

N. S = Not significant

The analysis in table 6 above shows that the calculated t-value at 0.05 level of significance 130 degree of freedom for 6 items is 0.19 while the critical value is 1.96. Since the critical value is greater than the t-calculated, the null hypothesis is therefore not significant for these items. This decision means that no significant difference exists between the responses of the staff and students on extent funding enhance students' skill acquisition on electrical machine repairs in Technical Colleges in Rivers State.

Discussion of Findings

The findings of this research showed that the grand mean was 2.18. This showed that electrical workshop resources in technical colleges are available at a low extent. The result of hypothesis showed that there is no significant difference between staff and students on the extent of electrical workshop equipment for effective teaching of NBTE syllabus in the public technical colleges in Rivers State. This study corroborates with Onyebuenyi and Mba (2017) who in their study stated that one of the most problem that perpetually disrupt the activities of skill acquisition in technical colleges is lack of instructional resources in the workshop. They further stated that the inadequacy of instructional resources in technical colleges have made skill acquisition process to be carried out haphazardly

The result of research question two showed that the cluster mean is 2.16. This implies infrastructures in technical colleges are available at low extent. Hypothesis showed that there is no significant difference between staff and students on the extent of infrastructure in the public technical colleges in Rivers State. In the study of Ibrahim and Abba (2020), reiterated that the level of infrastructure in technical colleges is very low, which caused under utilization of facilities needed for effective teaching and learning.

The result of research question three (3) and table five (5) showed that the cluster mean is 2.14. This showed that funding is available for acquisition of electrical machines repairs skills technical colleges at low extent. Hypothesis shows that there is no significant difference between staff and students on the extent of funding in the public technical colleges in Rivers State. The finding is in line with that of Usman (2011), who has it that lack of adequate fund is one of the predominant factor that has led to low level of skill acquisition among technical education students.

4. CONCLUSION

The concluded that there are deficiencies in the provision of workshop resources, infrastructures and funding for technical colleges in Rivers state. Hence, there students do not possess sufficient skills in electric machine repairs.

5. RECOMMENDATIONS

1. That electrical workshop and equipment should be inspected, up graded periodically to keep pace with technological development
2. Government should provide adequate funding for technical colleges in Rivers state so that the curriculum will be fully delivered to students.
3. Government should provide adequate infrastructure in technical colleges for easy implementation of technical education curriculum

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