

Comparative Analysis of School-Based Practical in Electrical and Electronics Trade Programme of Technical Colleges in Ogun State

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Abstract

This study investigated school-based practical in electrical and electronics trade programme of technical colleges in Ogun State. The study adopted a descriptive survey design. A sample of 105 respondents comprising 7 teachers and 98 year III students in electrical and electronics trade programme of two randomly selected technical colleges in Ogun State participated in the study. A structured Practical in Electrical and Electronics Trade Questionnaire validated by three experts was used for data collection in the study. A Cronbach Alpha reliability coefficient of 0.87 was obtained in a trial-test of the instrument in establishing its internal consistency. Three hypotheses guided the study. Data collected were analyzed using t-test at 0.05 level of significance. The findings revealed no significant difference in the mean responses of teachers and students from school I ($df = 54$; $t = 2.755$; $p > 0.05$) and school II ($df = 47$; $t = 1.541$; $p > 0.05$) on the extent to which practical activities hold in the training programme. On school-based practical activities, the study found no significant difference in the responses of respondents from the two schools ($df = 103$; $t = 2.079$; $p > 0.05$). Based on the findings, it was recommended that school-based practical activities should be well monitored with focus on checking the standard of practical activities and compliance with industrial standards in order to improve quality of the training and production of well-equipped electrical and electronics trade graduates. It was also recommended that technical teachers should be encouraged to focus on relevant practical activities in electrical and electronics trade programme to avoid waste of time on irrelevant activities.

Keyword: School-Based Practical; Electrical and Electronics; Electrical and Electronics Trades; Technical Colleges

INTRODUCTION

The expectation of Nigerian society is to see vocational and technical education recipients become entrepreneurs, create and establish jobs, become fully equipped with skills and competencies required to function in the work place especially in industrial sectors. These are some of the associated benefits and objectives of vocational and technical education training. According to the National Board for Technical Education (NBTE, 2011), the programme is intended to give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant. However, the contribution of graduates of this programme to both economic and national development in Nigeria after undergoing vocational training still remains a dream yet to come true. Issues are constantly raised on the efficacy of this training programme as its products could not meet up with the expectations attached to the programme and industrialists are becoming skeptical of these products as they are considered incompetent in carrying out activities related to their field.

Adepoju and Famade (2010) pointed out that a major concern which might greatly hamper the development and achievement of the objectives of technical programmes is “not paying attention to the ongoing activities in the training institutions” which are meant to bring about the achievement of stated objectives. The educators might either fail to properly carry out expected activities as stipulated by the curriculum or refuse to conform to standards required to produce quality graduates in the programme. The United Nations Education Scientific and Cultural Organization (UNESCO, 2011) pointed out that the proportions of components of technical education training which are general studies, practical training and related theory may vary considerably but the emphasis is usually on practical training which may be full-time in schools or part-time as supplementary education for apprentices or others requiring that practical training. In support, NBTE (2011) highlighted the component of technical education training which include general studies, trade practice and supervised industrial training/work experience, which accounts for 30%, 65% and 5% respectively of the total hours required for the programme. This shows that Technical Education programme should be basically practical oriented but most Nigerian schools continually build its recipients on theoretical knowledge.

Adepoju and Famade (2010) ascertained that the curriculum of Technical Education emphasizes workshop practice and industrial training/production work. Hence, school based workshop practice is very essential in the production of quality graduates who can be self reliant and employer of labour. School-based practicals are the basic workshop activities which are meant to expose students to a variety of skills and knowledge required in their field to fit into the world of work and understanding actual practice of theoretical principles. Poor emphasis on the practical aspect of Technical Education in schools is a major setback in the achievement of its purpose as most tertiary institutions charged with the responsibility to teach Vocational Technical Education subjects in Nigeria today are poorly equipped with machines and relevant tools and equipment (Nwogu, 2011). Meanwhile where facilities are available, incompetency of teachers makes them avoid practical teaching with their focus being more on theory which have contributed to inadequate practical experience of the students. Sara (2001) found that more than 60% of the staff teaching in technical education could not perform the skills or provide technical services they were expected to teach students despite their high level paper qualifications. Awobodu (2000) however noted that teacher utilization of relevant equipment, materials and tools in teaching facilitates learning and enhances students' achievement in Technical Colleges. Standard and qualitative skill acquisition training in electrical and electronic trade is expected to be carried out effectively in various higher education institutions among which technical college is one.

A Technical College is one of the institutions charged with the responsibilities of teaching Vocational and Technical Education and are regarded as the principal vocational institutions in Nigeria. Technical colleges give full vocational training intended to prepare students for entry to various occupations through practicals in the school (Shodeinde, 2013). Technical Colleges are geared towards producing craftsmen in various disciplines who are trained to acquire relevant knowledge and skills in different occupations for employment in the world of work (NBTE, 2000). Federal Ministry of Education (2004) ascertained that the Technical College is a segment of Technical and Vocational Education designed to produce craftsmen at the secondary school level and master craftsmen in advanced craft. Technical Colleges through school based practical train craftsmen in auto mechanics, plumbing, carpentry and joinery, cabinet making, painting and decorating, welding, electrical installation, radio and television repair, building construction and other areas.

Electrical and electronics trades are among the skilled areas studied in Technical Colleges. This programme aim at producing craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant with skills in domestic and industrial installation, as well as operate, maintain and repair electrical and electronic equipment, among others. The trade is composed of electrical installation and maintenance work; instrument mechanics; applied maintenance and repairs, as well as radio, television and electronic work (NBTE, 2011; UNESCO 2011). The trade provides learners with the practical skills and knowledge required for an electrical and electronic trade's person to be employed in the manufacturing, mining, oil and other industries. The skills developed in this trade through school based practicals include fault finding, servicing, modification of machinery and equipment maintenance (Shodeinde, 2013). Thus, teaching and learning of electrical and electronics trade subjects should be a dynamic activity-based and practical oriented one through proper utilization of basic technical facilities.

For students to acquire relevant skills in fields like electrical and electronics, students must receive facts about concepts, develop positive attitudes and possess certain physical and manipulative or practical skills that will broaden their cognitive, affective and psychomotor, capabilities (Akinnuoye, 2011). It is good to provide students with the foundation of skill and attitude or acquiring knowledge so that they will be adequately prepared to deal with future challenges (Awosika, 2004). Acquiring competence in skill training is one of the most essential activities of the school workshop which depends on a number of factors. These include availability of equipment, tools, and materials, adequate supply of technical education teachers, proper implementation and usage of technical equipment, tools and materials (Umunadi, 2004).

It has been observed that some technical schools do not hold practical regularly in their training programme while some teachers do not concentrate on teaching of practical. Also, some do not efficiently use available facilities during the practical sessions and all these definitely will hinder the achievement of the programme objectives. Supporting this view Obioma (2007) emphasized that Technical Education courses in our societies has failed to help students' achievement of skills, competencies and attitude because the subjects being taught nowadays do not give importance to students projects and workshop activities due to lack of power tools and hand tools which eventually hinder skill acquisition. Umunadi (2011) identified that though practical activities are undertaken in some Technical Colleges but is of poor standard while some are irrelevant to acquisition of saleable skills by the students. Also, Nwogu (2011) sees use of outdated facilities in schools for practical as a factor which would constantly reduce the quality of graduates who will not be able to operate modern facilities.

Use of technical facilities, equipment, tools and machines in school workshop play important role in student's skill acquisition required for productive and happy working life (Umunadi, 2004). Exposure of students to rightful training will inculcate the right type of values and attitudes for survival of an individual and Nigeria society (Nwogu, 2011). Umunadi (2011) noted that lack of material and equipment in schools could hinder the real practical of the concepts taught in the classroom which invariably leads to low skill acquisition. However, Nwogu (2011) discovered that lack of equipment in schools made students not to have ample opportunities to see and manipulate them in order to acquire the necessary knowledge and skills; Nwogu (2011) further explained that inadequate physical facilities in Technical Education is responsible for the quality of graduates produced. Where physical facilities such as workshops, machines and tools are not enough the school based practical activities are limited. Ogwo and Oranu (2006) pointed out that if students

do not practice craftwork they would not appreciate an advance in technology. They stated that starting to practice from school using materials prepare foundation for technological advancement.

Statement of the Problem

The basic purpose of VTE is to build its recipients with vocational skills, knowledge and to develop the right attitude to work among others for economic sustainability and national development. Practical training is one of the core components identified as instrumental to achieving this but there have been problems of ill equipped technical education graduates yearly who cannot display requisite skills required to function in work places. Also, the objective of raising self-reliant craftsmen or technologists is becoming unachievable as majority of these graduates look for white collar jobs having not possessed a level of competency required to be self-employed, self-reliant and economically stable. Could this be as a result of poor school based practicals?

It is also worthy to note that the qualitative and genuine nature of practical activities in the school depend on several factors among which are availability of equipments, quality of teachers training and expertise of the teacher in handling equipment for practical among others which could bring variability in what is obtainable from one school to the other. It is therefore necessary to carry out a comparative analysis of school-based practical as practiced in different Technical Colleges in Ogun State.

Purpose of the Study

The aim of this study was to compare the school-based practical in the electrical and electronics trade programme of Technical Colleges in Ogun State. Specifically the study investigated whether:

1. There is difference in the mean responses of electrical and electronics trade teachers and students from the two Technical Colleges on the extent to which practical activities are held in the training programme.
2. There is difference in the mean responses of electrical and electronics trade teachers and students from the two Technical Colleges on the extent to which student are involved in practical activities in the training programme.
3. There is difference in the mean responses of respondent from school I and school II on school based practical activities in electrical and electronics trade training programme.

Hypotheses

In the direction of the aims stated above, the following hypotheses were tested at 0.05 level of significance:

- HO₁: There is no significant difference in the mean responses of electrical and electronics trade teachers and students from two Technical Colleges on the extent to which practical activities are held in the training programme.
- HO₂: There is no significant difference in the mean responses of electrical and electronics trade teachers and students from two Technical Colleges on the extent of students' involvement in practical activities in the training programme.
- HO₃: There is no significant difference in the mean responses of respondents from school I and school II on school-based practical activities in electrical and electronics trade training programme.

METHODOLOGY

The study adopted a survey research design. The population for this study comprised all 28 teachers and 354 year III students of electrical and electronics trade programme in Ogun State Technical Colleges. The information was obtained from the office of the director, Ogun State Ministry of Education, Science and Technology. Teachers are involved in this study because they are in charge of practical classes while year III students were employed because they have been exposed to practical sections from their first year in the course of study.

A simple random sampling technique was used in selecting two among the eight Technical Colleges in the state. The selection of school was done such that a State Government owned Technical College and a Federal Government Owned Technical College were involved in the study which implies equal proportion in their representation. All the 7 teachers and all 98 year III Electrical and electronics trade students from the two selected Technical Colleges were involved in the study. The total sample of 105 respondents participated in the study. A structured Questionnaire on School Based Practical in Electrical and electronics Trades (QSBPEET) was used for the study. It consisted of 16 item statements and a four point scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The scale was assigned with values of 4, 3, 2 and 1 for Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) respectively.

Face validation of the instrument was ascertained by three experts in Vocational and Technical Education Department, two from University of Benin, Benin City and one from Tai Solarin University of Education, Ogun State. Correction and input of the validators were incorporated into the final instrument. Reliability of the Instrument A trial testing of the instrument was carried out for the purpose of determining the internal consistency of the instrument using 5 teachers and 20 students of electrical and electronics trade from another technical college in the state. The Cronbach, alpha reliability coefficient of 0.87 was obtained. The researcher personally visited the selected colleges and administered the research instrument and 100% return rate was recorded. The hypotheses generated were tested at 0.05 level for significance using t-test.

RESULTS

Hypothesis 1

There is no significant difference in the mean responses of electrical and electronics trade teachers and students from two technical colleges on extent to which practical activities hold in the training programme.

Table 1: t-test Showing Difference in the Responses of Teachers and Students on Extent to which Practical Activities Holds in Electrical and Electronic Trade Programme

A. School I									
Holding Practical's	N	Mean	Mean diff	St. Dev	df	t	Sig.	Remark	
Teachers	4	57.23	4.58	12.96	54	2.755	.321	NS	
Students	52	52.65		13.65					
B. School II									
Holding practical's	N	Mean	Mean diff	St. Dev	df	t	Sig.	Remark	
Teachers	3	55.23	4.63	12.96	47	1.541	.334	NS	
Students	46	50.60		16.65					

Table 1, parts A and B show the difference in the mean responses of electrical and electronic trade teachers and students from two technical colleges on extent to which practical activities hold in the training programme. The result presented in table A shows that there is 4.58 mean difference between the responses of teachers and students from school I on extent to which practical activities hold in the training programme. However, the table revealed that the difference in the mean response of teachers and students in school I is not significant ($df = 54$; $t = 2.755$; $p > 0.05$). The data on table B revealed a mean difference of 4.63 between the responses of teachers and students from school II but the difference was not significant ($df = 47$; $t = 1.541$; $p > 0.05$). Hence, hypothesis one was not rejected. This implies that there is no significant difference in the mean responses of electrical and electronic trade teachers and student from the two technical colleges on extent to which practical activities are held in the training programme.

Hypothesis 2

There is no significant difference in the mean responses of electrical and electronics trade teachers and students from two technical colleges on extent of students' involvement in practical activities in the training programme.

Table 2: t-test Showing Difference in the Responses of Teachers and Student on Extents of Students' involvement in Practical Activities in Electrical and Electronic Trade Programme

A. School I								
Students involvement	N	Mean	Mean	St. Dev	Df	T	Sig.	Remark
			Diff					
Teachers	4	66.62	3.33	11.63	54	3.265	.228	NS
Students	52	63.29	12.71					
B. School II								
Students Involvement	N	Mean	Mean	St. Dev	Df	T	Sig.	Remark
			Diff					
Teachers	3	62.62	2.66	11.63	47	3.241	.204	NS
Students	46		12.71					

Table 2, parts A and B show the difference in the mean responses of electrical and electronic trade teachers and students from the two Technical Colleges on extent of student's involvement in practical activities in the training programme. The result presented in Table A shows a mean difference of 3.33 between teachers and students on extent of students' involvement in practical activities in the training programme. The difference between the respondents in school I was however not significant ($df = 54$; $t = 3.265$; $p > 0.05$). Result presented in table B revealed a mean difference of 2.66 between school two respondents but the difference is not significant ($df = 47$; $t = 3.241$; $p > 0.05$). Hence, hypothesis two was rejected. This implies that there is no significant difference in the mean responses of electrical and electronic trade teachers and students from the two Technical Colleges on extent of student's involvement in practical activities in a training programme.

Hypothesis 3

There is no significant difference in the mean responses of respondents from school I and school II on school-based practical activities in electrical and electronics trade training programme.

Table 3: t-test Showing Difference in the Mean Responses of Respondents from School I and School II on School Based Practical Activities in Electrical/Electronic Trade Programme

School	N	Mean	St. Dev	df	t	Sig.	Remark
Practical							
School I	56	83.30	1.02	103	2.079	.312	NS
School II	49	75.95	.91				

Table 3 shows the difference in the mean responses of respondents from school I and school II on school based practical activities in electrical and electronics trade training programme. The table reveals no significant difference ($df = 103$; $t = 2.079$; $p > 0.05$) in the mean responses of respondents from school I and school II on school based practical activities in electrical and electronics trade. Hence, hypothesis three was not rejected. This implies that there is no significant difference in the mean responses of respondents from school I and school II on school-based practical activities in electrical and electronics trade training programme.

DISCUSSION

Based on hypotheses generated and tested in the study on differences in the responses of teachers and students from two schools on issues relating to practical activities in the electrical and electronics trade training programme in technical colleges, findings revealed that there is no significant differences in the mean responses of respondents from the two schools with respect to extent to which practical activities holds, students' involvement in practical activities, as well as general school based practical activities.

On the extent of practical activities holding in the training programme, the findings in this study revealed no significant difference between responses of teachers and students which indicate that practical is taken seriously as expected in the programme. This could mean that almost the same situation is applicable to school-based practical in different technical colleges in Ogun State and this may be responsible for same quality of technical graduates who are always considered unfit for the world of work. In agreement with regular practical activities in electrical and electronics trade programme, Awobodu (2000) reported that regular teacher's utilization of relevant equipment; materials and tools in teaching electrical and electronics would facilitate learning and enhances student achievement. Udoutin (2001) also observed that students' constant utilization of tools and equipment could enhance skills development while student practical skills would enable them to earn a living. Nwogu (2011) found that technical education through effective practical experience leads to acquisition of basic knowledge, skill abilities, understanding and attitudes needed for one's efficient performance in a chosen occupational career for self-reliance and national development. Contrary to the finding of this study which established that practical activities are constantly ongoing in the training programme, Umunadi (2004) found that some technical schools do not hold practical classes regularly while some teachers do not concentrate on teaching of practical. The contradiction in the findings explains that the required proportion of the practical inclination of the programme were not taken into consideration by some schools which implies emphasis on the theoretical knowledge against the practical skill acquisition which is the basis of this trade programme. If this situation is the same across technical colleges in the past, it may have been responsible for the low performance of electrical and electronics graduates in practice. Furthermore, Umunadi (2004) equally noted that some teachers do not efficiently use available facilities during practical sessions and all these definitely hinder the achievement of the programme objectives.

On the extent of student's involvement in practical activities, the study found no significant difference between teachers and students responses. This implies that electrical and electronics trade students from different schools seems to have similar practical exposure. This could probably mean that the quality of practical to which technical graduates are exposed is of lower standard to what the industry requires and thereby forms the basis of their inability to perform when faced with the real work situation. In agreement with student's involvement in practical activities, Akinuoye (2011) asserted that for skill acquisition to effectively take place, students must receive facts about concepts, positive attitudes and certain physical, manipulative or practical skills that will broaden their cognitive, affective and psychomotor capabilities. Shodeinde (2013) in support of this finding found that students skills were developed in training through practical and the school based practical teaching enhances acquisition of various requisite skills. Umunadi (2004) also found that acquisition of skills, inculcating right attitudes and ability to improve students' academic performance were based on students' involvement in constant practice of theoretical concepts.

On school-based practical activities, the study found no significant difference in the responses of respondents from the two schools. This review that school-based practical in electrical and electronics trade programme seems to be handled at the same standard in technical colleges. However, the standard and quality of practical activities offered by the school may have lead to constant production of half-baked technical graduates who cannot link classroom theories to real work practice. In support of school-based practical, Umunadi (2004) found that effective use of technical equipment, tools, machines and facilities in school workshop for practical plays important role in the development of students' knowledge, skills and attitudes required productive and happy working life. Umunadi (2011) identified that though practical activities are undertaken in some of the technical colleges, they are of poor standard while some are irrelevant to acquisition of saleable skills by the students. Also, Nwogu (2011) saw use of outdated facilities in school for practice as a factor which would constantly reduce the quality of graduates who will not be able to operate modern facilities.

CONCLUSION

It can be concluded that school-based practicals are undertaken in technical colleges in almost similar manner. However, the quality of practical activities may be substandard to have resulted in production of incompetent graduates over the years. Exposure of electrical and electronics students to relevant school-based practical and use of up-to-date equipment would improve their competency and self-reliance which will foster the likes of self-employment, economic stability and national development.

RECOMMENDATIONS

The following are recommended based on the findings of this study:

1. Constant and regular monitoring of practical activities in technical colleges should be done by appropriate bodies within and outside the school to improve the quality of the output of the training programme.
2. Monitoring of school-based practical activities should also focus on checking the standard of practical activities and compliance with industrial standard in order to improve quality of the training and production of well-equipped electrical and electronics trade graduates.

3. Technical teachers should be encouraged to focus on relevant practical activities in electrical and electronics trade programme to avoid waste of time on irrelevant activities.
4. Use of relevant equipment and materials in practical classes should be ensured to familiarize the students with the reality of what to face in their working life.
5. Quality control should be introduced into the programme to ensure that only practical competent technical students would graduate from the programme and not just passing theoretical examinations.

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