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Strategies For Enhancing The Employability Of Electrical Technical Graduates Of Technical Institutions In South Eastern States Of Nigeria

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Abstract: The general purpose of this study was to determine strategies for enhancing the employability of electrical technology graduates in technical colleges in South-east Nigeria. The survey research design was used in this study. This study was carried out in two of the five South Eastern States of Nigeria, namely Enugu and Imo States. A total of 115 respondents were used for the study. A structured questionnaire was used to collect data for the study. Data collected were analyzed using the Mean ($\overline{X}$) and Standard deviation (SD), and t-test. Results indicated that the majority of the respondents agreed that qualifications such as NCE (Technical), HND, (Electrical), B.Sc (Electrical) and M.Ed (Electrical) are suitable and appropriate for teaching electrical technology in technical colleges in the study area. It was also discovered that several technical skills are required for the employability of electrical technology graduates. The study also identified several instructional strategies and facilities required for teaching and learning in order to improve the employability of electrical technology graduates. It was recommended that in order to enhance employability of electrical technology graduates qualified teachers should be employ to teach the course.

Key words:

INTRODUCTION

Employment is the state of having been given or engaged in a job for some form of payment. Employment could be full time, part-time, or self employed (Denga, 2002). Every person choosing a career does so with the hope of securing employment in that field, probably as a professional. This is because, finding a satisfying and secured job is the ultimate goal of every reasonable person who chooses a career (Paula and George, 1996). Thus, it is always distributing for one to choose a career, strive and graduate in it, only for the person to come out and roam the streets because of unemployment. Unemployment is a situation where an individual who is able, willing and qualified to work but cannot get a job (Ugwuanyi, 1996). Unemployment, as experienced by graduates of electrical technology in particular, and other disciplines in the education sector in general, is a serious problem, more so as Erewari (2004), observed that the level of unemployment in any society is an indication of low quality manpower. Consequently, there is a need to eradicate or reduce to the barest minimum the menace of unemployment especially on technical graduates. It is only reliable strategies that can alleviate this problem of unemployment among electrical technology graduates (Omianabo, 2005).

A strategy can be explained as a specialized and skilled way of approaching a task or finding solution to problems with a view to achieving a stated goal (Zehra, 1993). That is a strategy is planned way of achieving preconceived objective(s). a strategy requires prior planning and programming of sequence of steps or events (logistics) and resources towards the goal in view (Olaitan, Igbo, Nwachukwu, Onyemachi and Ekong, 1999).

Employability refers to the characteristics or qualities a job applicant should posses to merit or gain employment. (Sherer and Edadie, 2002). According to Kyoto (1997) the employability of any qualified technical college graduate depends on the skill, creativity and experience of the individual and the demands of the jobs at hand. Discussions on the need for education reforms and restructuring typically include concerns about the gap between the skill requirements for entry level employment and the skill level of entry-level job applicants (Stasz, 1993).

Most employers' dissatisfaction with young job applicants is primarily due to inadequate technical knowledge or skill. More than half of young people leave school without the knowledge or skill required to find and hold a good job.

Technical education is a training in industrial technology aimed at the production of skilled manpower for the industrial sector of the economy. Course specializations in industrial/technical education are Auto-Mechanics/ Metal Works; Building construction, Woodworks, Electrical/Electronics and so on (Okorie, 2001). Industrial education, therefore, is aimed at the development of basic manipulative skills, safety practice and application of scientific knowledge needed for employment in the industries as technologist (Okoro, 1999).

According to Okories (2001), industrial education is studied at the Primary school level as Pre-vocational education and continues through Secondary School level up to University level. This lays a sound basis for scientific thinking for students from primary level and gives opportunities for the development of manipulative

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skills for effective functioning within the limit of the students' capacity in the society. By the time these students advance through these levels of education, with theoretical and practical skills acquired up to University level, students must; have been empowered with needed skills to face the challenges of jobs in the industries (Federal Ministry of Education (FME) 2002).

Technology, according to Ukeji (1982), is the application of scientific findings of modern production techniques to increase production. Olumba (1996) asserted that technology is the application of scientific and coordinated knowledge to bring about increase in the production of effective goods and services. Technology therefore is the application of scientific knowledge to bring about effectiveness in the production of goods and services in a wide, though, related field of knowledge to bring about effectiveness in the production of goods and services.

Electrical technology is an area of specialization in industrial education. It includes such areas as Construction, Installation, Panel Building, Repair and Rewind, Instrumentation, Maintenance and Highway Electrical Systems (National Board for Technical Education (NBTE) 2004). According to Brimlley (2004) background knowledge in engineering materials, energy conversion and transmission is required. Electricity is essential for power, air conditioning and refrigeration. Electricians, install and connect, test and maintain electrical systems for a variety of purposes, including lighting, air conditioning and refrigerator control, security and communications, They also may install maintain the electronics controls for machines in business and industry. Although most electricians specialize in construction or maintenance, a growing number do both (IEE, 2005).

Identifying, strategies for promoting the employability of technical education graduates is very essential for economic growth and development of any country even more necessary for developing countries who are experiencing problems bothering on inadequacy or lack of skilled manpower in Science and Technology (Sarki-Gohir, 1994). According to Kyoto (1997) the development of any nation depends on that country's focusing on science and Technology.

Also, according to Ezeh (1997) Africa and other developing societies in the world today are well aware that they have problems with regards to science and technology. They are aware that the rate of development in their own societies is very slow when compared to what obtains in most developed courtiers of the world. He further explained that a sound and deep-rooted science and technological base for any nation, will no doubt improve on the economic status of the country. Ezeh (1997) also observed that some developing nations of the world present the most deceiving picture of personnel situation. For instance, in Nigeria today there are many polytechnics and University graduates in almost all fields of study. There are also many technical colleges, polytechnics or colleges of technology. Each of these institutions turn out graduates in thousands every year, yet the nation is among the countries that are believed to lack skilled manpower (Okorie, 2001).

Thus, as accurately noted by Olaitan, Igbo, Nwachukwu, Ekong and Onyemachi (1999) in order to achieve the objectives of technical education/institutions and ensure the quality relevance to the level of technical education acquired by the learners, considerable new changes should take place in the content and delivery of instructions in the institutions. Olaitan *et al* explained that the first step for achieving the technical education objectives should include mapping out rigorous admission requirements as obtained in Medicine, Pharmacy, and so on. This requirement ensures that only the best brains are admitted into technical institutions to ensure that only hardworking, creative and competent students are recruited for technological training and education. This measure will not only attract respect to technical institutions but also ensure that only high quality students capable of acquiring the desired skills, knowledge and experience are taken. Olaitan *et al* further stated that the recruitment of highly qualified, skilled and experienced teachers will ensure the desired qualitative grooming. The quality of teachers is of paramount importance since a teacher cannot teach what he does not know. Ultimately, if a graduate is well taught and has the desired knowledge, skill and experience, undoubtedly his employability is assured.

Okorie (2001) asserted that students' industrial Work Experience scheme (SIWES) can also provide a solid backing for the practical experience needed by technical college students. When students are posted to firms related to their field of study for a year or more, they will be adequately exposed to real life fieldwork, thereby enriching their skill and experience. Okorie (2001) explained that training and research as presently being carried out require better attention since changing models of technology call for the introduction of certain innovations in order to match these new technologies with employment. Okorie observed that new approaches to the instructional process are required as learner profiles and their learning conditions continue to change with the changing world. Consequently, there is an urgency for the improvement of technical education programmes and policies which should aim at examining the quality of the training process for technical teachers and students alike for better employability of the technologists of all fields. The technical teacher training programme covers curricular pedagogical, technological and managerial innovations.

According to Nwachukwu (2001) the excellence of teacher' professional qualifications, acquired skills and experiences, remain the first and most important prerequisite, since technical education is education for work and creative ideas. Nwachukwu explained that students should be well prepared for their future roles as citizens and professional in the world of work. The vision is that the acquired functional knowledge and useful experience will lead them to gainful employment in the world of work. Ominabo (2005), in his study found that technical college graduates, especially those in the Electrical Technology Unit, who are expected to work in the electrical related industries because of lack of knowledge and skills required for job in the industries shy away. This situation has necessitated a deep involvement of the industry on the training programme of these technical college students. Olaitan *et al* (1999), also explained that to ensure the effective participation of the industry in the skill development of technical), also explained that to ensure the effective participation of the industry in the skill development of technical college gradates, there should be proper harmonization of school industry relations and cooperation.

According to Carnoy (1997) the technological revolution is creating new goods and services and altering how and where they are produced. One of the principle issues for all countries is how these new technologies will affect employment and the composition of skills demanded in this world of work. There is no doubt therefore, that strategies, properly planned and effectively implemented, will in all ramifications contribute immensely towards developing any economy. Thus for Nigeria to escape from the bondage of shortage of skilled manpower and to exploit her resources effectively, the county has to look inwards by reforming her educational policies and programmes, stressing on Science and technology, and by so doing produce qualified and experienced graduates in all technical areas especially electrical technology.

Statement of the Problem:

According to the Federal Ministry of Education (2000) the goals, with respect to Industrial Education (electrical technology option) are yet to be achieved. The goals of technical colleges stated in the National Policy on Education (2004) among others are to make graduates acquire both skills that will enable them to be self reliant and be useful members of the society, and to develop and inculcate proper values for the survival of graduates and the society at large. (FME 2004). Fagbemi (1988) and Nzeagwu (1997), asserted that institutions running Industrial Education in the country are uninformed about the relevant competencies and skills required of electrical technology graduates for gainful employment. Graduates, therefore, cannot do much to salvage themselves from the situation. Students of electrical technology in Nigerian Universities graduate from their various institutions yearly, with the aim of securing employment in the industries, but their aspirations, most of the time, prove abortive (Okoro, 1999).

A number of complaints from the industries which are the causes of most electrical technology graduates not securing employment in there industries were noted by Dangana (2002). These complaints centered on non-possession of the necessary skills relevant for employment by graduates. Also that those graduates interviewed for employment into the industries do not have the basic knowledge and skill to do their prospective jobs. These attributes, which are lacking among graduates of industrial education. Emphasizing on the lack of skills among technical college graduates, Jacobs (2001), explained that the demand of industries from graduates and trainees, is a collection of general attitudes and disposition. He explained that employability skills are very much needed in the industry. He further defined employability skills are the attributes of employees that make them assets to the employer.

Consequently, Ramsbotham (2000) advised that ways of waking learning meet the needs of learners, employers and the modern work place in the place in the face of technological innovations and changing employment trends and ways of working should be explored. However, David and Robson (2002) remarked that emphasis on basic skills might be at the expense of offering broader education, providing vital skills that are necessary to help these electrical graduates succeed in the world of work.

Research Questions:

The following research questions were formulated to guide study:

1) What appropriate qualification can enhance teaching of electrical technology.
2) What technical skill are required for the employability of electrical technology graduates.
3) What instructional strategies are required for effective teaching and learning of electrical of electrical technology.
4) What instructional faculties are required for effective teaching and learning of electrical technology
5) How should student industrial work experience scheme (SIWES) be organized to improve electrical technology graduates employability.
6) How should, technical institutions collaborate with industries for effective teaching and learning of skills required in the industry and would of work.

Hypotheses:

The following null hypotheses were tested in the study at 0.05 level of significance.

HO_1: There is no significant mean difference between the responses of electrical technology teachers and industrial staff on how SIWES should be organizes to improve the employability of electrical technology graduates.

HO_2: There is no significant mean difference between the mean responses of technical college teachers and industry staff on the instructional facilities required for effective teaching and learning of electrical technology.

HO_3: There is no significant mean difference between the opinion of electrical technology teachers and industrial staff on the instructional strategies required for effective teaching of electrical technology.

HO_4: There is no significant mean difference between the responses of experienced and less experienced electrical technology teachers on how technical colleges could collaborate with the industry for effective teaching and learning of electrical technology.

Method:

Design of the Study:

The survey research design was used in this study. This design was considered very suitable for this study because the respondents are located over a wide area. This design made it possible for the necessary data to be collected from the respondents. This decision was based on the views of Olaitan, Ali, Eyo, and Sowande (2000) and Osuala (2001) that the survey research design employs the study of different sizes of populations to find out their relating opinions, distributions and interrelations about prevalent issues and problems of societies.

Area of Study:

This study was carried out in two of the five South Eastern States of Nigeria, namely Enugu and Imo States. The focus was no technical institutions that offer courses in electrical technology in these states.

Population and Sample of the Study:

The population for the study comprised all the 42 electrical technology teachers in the two States. These 42 electrical technology teachers are teaching in five technical institutions in Enugu and Imo States as of the time of this study. The study also involved 73 staff of electrical related industries in the States, giving a total of 115 people. All the 115 respondents were used for the study, since the number is relatively small. There was no sampling.

Instrument for Data Collection:

A structured questionnaire was used to collect the necessary data for the study. The instrument for data collection was made up of five sections namely: Section A – Personal data; Section B – technical skills required by industries; Section C – instructional strategies required for effective teaching of electrical technology; Section D – Instructional facilities required for teaching electrical technology; Section E – How SIWES can be organized Section F – How technical institution should collaborate with industry. The Instrument was patterned along a five point likert type rating scales.

Validation of the Instrument :

The instrument for data collection was subjected to face validation by three experts drawn form the Department of Vocational Teacher Education, University of Nigeria, Nsukka. The face validation was to determine the appropriateness of the questionnaire items. This is because face validation is often used to indicate whether an instrument appears to measure what it is targeted at. Face validation, therefore, determines both the extent and relevance of the questionnaire items to the objectives of the study and the research questions (Ezeji, 2004).

The inputs and comments from the experts guided the researcher in modifying the instrument before administering it to the respondents.

Reliability of the Instrument:

Internal consistency of the instrument was determined using the Cronbach Alpha (α) reliability coefficient. This is because of the polychotomous nature of the response modes. According to Uzoagulu (1998), Cronbach Alpha (α) can be useful for in estimating the internal consistency. The reliability coefficient of the sections B-E were found to be 0.77, 0.69; 0.78 and 0.75 respectively. The coefficient of the entire instrument was found to be 0.76, which was considered high enough to regard it as reliable.

Method of Data Collection:

The instrument was personally administered by the researcher and two research assistants recruited and well drilled by the researcher on how to carry out this assignment. This was because the study covered a wide area (two States) and also to ensure timeliness and minimize loss of instrument due to postage.

Method of Data Analysis:

Data collected from the respondents were analyzed using the Mean ($\overline{X}$) and Standard deviation (SD). The t-test, at 0.05 level of significance was used for testing the hypotheses. A mean score of 3.50 and above was accepted as agreement, while a mean score of less than 3.50 was rejected or regarded as disagreement. Any calculated t-value that is above the table t-value was regarded as significant, while t-values below the table value were accepted as not significant.

Results:

This chapter presented the results and discussion of the data analyses for the study. The presentations were organized according to the research question and null hypotheses that guided the study.

Research Question 1:

What appropriate qualification can enhance teaching of electrical technology?

The data required to answer this research question is presented in table 1

Table 1: Frequency of the appropriate for teaching electrical technology.

S/NO	Qualification of teaching electrical	Frequency	Percentage
1	OND	38	35.8%
2	NCE (Technical)	102	96.2%
3	HND (Electrical)	101	95.3%
4	C and G (Inter in Electrical)	40	37.7%
5	B.Sc (Electrical)	104	98.1%
6	Med (Electrical)	98	92.5%
7	M. Sc	46	43.4%
8	Ph.D (Electrical)	46	43.4%

The data presented in table 1 above showed that items 2,3,5 and 6 have their percentages above 50%. This implies that the majority of the respondents responded positively to those items. In other words they agreed that these qualifications NCE (Technical), HND, (Electrical), B.Sc (Electrical) and M.Ed (Electrical) are suitable and appropriate for teaching electrical technology in technical colleges.

Research Question 2:

What technical skills are required for the employability of electrical technology graduates?

The data required to answer this research question is presented in table 2

Table 2: Mean and standard deviation of technical skills that can enhance employability of electrical technology graduates.

S/NO	Graduates should process ability to	Means X	S.D	Remark
9	Determine the relative strength and uses of different types of electrical wires and relative insulation requirements for practical use.	402	0.42	HR
10	Determine the positive and negative parts of components and systems	3.86	0.82	HR
11	Determine the relative amperes, watts and voltage of components and systems	4.44	1.11	HR
12	Have a good knowledge of the laws and principles of current flow, control, restriction, storage and compatibility	4.24	9.56	HR
13	Have a good knowledge of safety procedures and practices and relevant first aid and techniques	4.44	0.62	HR
14	Understand, interpret and make electrical drawings and sketches	3.66	0.84	HR
15	Undertake electrical project planning and execution	4.04	1.15	HR
16	Identify major working tools and care	4.02	1.20	HR
17	Use working tools effectively	4.58	1.24	VHR
18	Install, inspect and test wiring systems both first fix and second fix"	4.52	0.88	VHR
19	Putt together complex electrical and electronic panels, using programmable logic controllers	4.62	0.56	VHR
20	Repair electrical components in machinery such as transformers, motors, compressors and pumps.	4.22	0.42	VHR
21	Identify electrical symbols	4.04	0.08	VHR
22	Have the knowledge of types of insulation and armored cables in the factory.	4.62	0.60	VHR
23	Have knowledge of installations and protection for the users and installations	4.62	0.82	HR
24	Determine the speed of current flow in machines	3.52	0.48	HR
25	State wire joining and bending principles	4.04	0.16	HR
26	Determine general safety in electrical operation environment or industry.	4.46	0.26	

Key: VHR –Very Highly Required

HR – Highly Required

The data presented in table 2 above revealed that all the items had their mean above cut-off point of 3.50. Therefore the respondents agreed that the technical skills listed are required for the employability of electrical technology graduates. The standard deviation of technical skills required items ranged from 0.42 to 1.26. This shows that the respondents were close to one another in their responses and that they were not very far from the mean.

Research Question 3:

What instructional strategies are required for the effective teaching and learning of electrical technology?

The data required to answer this research question is presented in table 3

Table 3: Mean and standard deviation of instructional strategies required for effective teaching and learning of electrical technology.

S/NO	Instructional strategies for effective teaching and learning of electrical technology	Means X	S.D	Remark
27	Teaching students using constructivist approach that is helping students to construct their own knowledge	4.56	1.15	VHR
28	Taking students on field trips especially when the necessary equipment and materials for that particular topic are not available	4.58	0.56	VHR
29	Adopting mentor-mentee relationship in imparting electrical skills to students	4.02	1.12	HR
30	Applying trouble – shooting techniques in teaching certain aspects of electrical technology eg auto wiring.	3.88	.0.82	HR
31	Teaching electrical skill through project method	4.43	0.88	HR
32	Using demonstration method in most practical skills in electrical technology	3.86	0.82	HR
33	Adopting modern teaching methods like meta learning, cognitive apprenticeship in teaching electrical technology to help them develop higher order thinking skills.	4.56	0.52	VHR
34	Teaching electrical skill by giving assignment to the students	4.30	1.24	HR
35	Encouraging students to engage in evening local apprenticeship in electrical workshops within the community.	3.03	1.06	AR
36	Allowing students to practice what they were taught on real job	3.59	1.26	AR

Key: VHR –Very Highly Required
HR – Highly Required
AR – Averagely Required

The presented in table 3 above revealed that with the exception of item 35 the mean responses of electrical technology teachers and industrial staff to all other items are greater than cut-off point of 3.50. This indicated that majority of the respondents used for this study agreed that instructional strategies listed are required for effective teaching and learning electrical technology. The standard deviation of the instructional strategies ranged from 0.52 to 1.26. This showed that the respondents were close to one another in their responses and that they were not very far from the mean.

Research Question 4:

What instructional facilities are required for the effective teaching and learning of electrical technology?

The data required to answer this research question is presented in table 4

Table 4: Mean and standard deviation of instructional facilities required for effective teaching of electrical technology graduates.

S/NO	Instructional facilities for effective teaching and learning of electrical technology. Adequate provision of the following:	Means X	S.D	Remark
37	Standard workshop with sufficient work stations	4.12	0.47	HR
38	Pair of pliers	4.00	0.32	HR
39	Hack saws	4.24	0.43	HR
40	Drilling machines	3.89	0.47	HR
41	Electric motors	4.02	.0.47	HR
42	Hammers	4.02	0.59	HR
43	Set of screwdrivers	4.33	1.02	HR
44	Gimlets	4.52	0.43	VHR
45	Grinding machines	4.11	0.55	HR
46	Electric cables	3.98	0.36	HR
47	Electric accessories	4.04	1.15	HR
48	Power supply units	4.56	0.46	VHR
49	Illumination wires	4.54	1.03	VHR
50	Work benches	3.98	0.52	HR
51	Bench vice	3.98	0.56	HR
52	Storage facilities	4.06	0.57	HR
53	Hand shears	3.88	0.32	HR

The data presented in table 4 above revealed that all the instructional facilities had mean ranging from 3.89 to 4.56. This indicated that all the facilities were required for effective teaching and learning of electrical technology because their means were above the cut off point 3.50. The standard deviation of the instructional facilities items ranged from 0.32 to 1.15. This showed that the respondents were close to one another in their responses and that they were not very far from the mean.

Research Question 5:

How should students' industrial work experience scheme be organized to improve electrical technology graduates employability?

The data required to answer this research question is presented in table 5

Table 5: Mean and standard deviation of how SIWES should be organized to improve electrical technology graduates employability.

S/NO	How SIWES should be organized to improve employability	Means X	S.D	Remark
57	Organize seminars, conferences and workshops in both industries and educational institutions on how SIWES should be organized	4.22	1.05	A
58	Identify the specific tasks and activities students should engage in during SIWES	4.82	0.52	SA
59	Examine students log book to ensure effective daily, weekly and monthly participation in SIWES	4.60	1.12	SA
60	Identify with constituted bodies such as NUC, NBTE, ITF etc on how to achieve better posting of students on SIWES	4.62	0.88	SA
61	Identify through research, the skills knowledge and attitude expected of professionals in each job and convert them into training package.	4.82	0.56	
62	Through research, update excising training programme in electrical technology for staff to apply in training students.	3.80	1.24	
				SA
				A
63	Use student participation log books to identify the gap between academic programmes and the actual job settings in industrial and include them in curriculum	3.86	1.15	A
64	Ensure adequate and critical supervision of students' log book	4.86	1.15	A
65	Standardize and formalize SIWES.	3.62	1.22	A

The data presented in table 5 revealed that items 57 to 64 had their mean above cut off point of 3.50. This indicated that majority of the respondents used for this study agreed with this items as how industrial work experiences scheme should be organized. The standard deviation of the items ranged form 0.52 to 1.24. This also showed that the respondents were closed to one another in their responses and that they were not very from the mean.

Research Question 6:

How should technical institutions collaborate with industries for the effective teaching and learning of the skills required by the industries and world of work?

The data required to answer this research question is presented in table 6

Table 6: Mean and standard deviation of how technical institutions should collaborate with industries for effective teaching and learning of the skills required by the industries and the world of work.

S/NO	How technical institution should collaborate with industries and the would of work	Means X	S.D	Remark
66	Forming and implanting industrial coordination committees	4.44	0.46	A
67	Forming of advisory committee on partnership between institutions and the industries	3.88	0.59	A

68	Involving the industry in training students and staff of institutions in electrical technology programmes.	4.36	0.50	A
69	Involving professionals in industries in part-time lecturing in technical institutions.	4.34	0.48	A
70	Establishing a joint in-service training for both industrial and institutional staff of electrical technology.	4.21	0.21	SA
71	Organizing seminars, workshops and conferences for both industrial and institutional staff on electrical technology programmes.	4.57	0.45	A
72	Setting up short term courses in the industries for updating the skills and knowledge of institutional staff in electrical technology.	4.28	0.45	A
73	Allowing industries to examine and make input in the curriculum of electrical technology in intuitions	3.31	0.49	A
74	Encouraging industries to provide occupational placement for graduate of electrical technology.	4.53	0.51	SA

The data presented in table 6 above revealed that all the items on how technical institutions should collaborate with industries had mean responses ranging form 3.88 to 4.57. This means that the respondents agreed on items because their means were above the cut-off point 3.50. The standard deviation of the items ranged from 0.21 to 0.59. This showed that the respondents did not differ much in their responses and that they were not very far from the mean.

Hypotheses 1:

HO_1: There is no significant mean difference between the responses of electrical technology teachers and industrial staff on how student industrial work experiences scheme SIWES should be organized.

The data for testing the hypothesis were presented in table 7.

Table 7: The t –test analysis of the mean responses of electrical technology teachers and industrial staff on how SIWES should be organized.

S/N	How SIWES should be	X_1	SD_1	X_2	SD_2	t-table	T-cal	Decision
1	Organize seminars, conferences an workshops in both industries and educational institutions on how SIWES should be organized	4.70	0.41	4.65	0.52	0.090	0.553	NS
2	Identify the specific tasks and activities students should engage in during SIWES	4.24	1.14	4.08	0.78	0.196	0.817	NS
3	Examine students log book to ensure effective daily, weekly and monthly participation in SIWES	4.40	0.48	4.62	0.38	0.086	12.555	NS
4	Identify with constituted bodies such as UNC, NBTE, ITF etc on how to achieve better posting of students on SIWES	4.44	1.28	4.60	0.51	0.200	-0.800	NS
5	Identify through research, the skills knowledge and attitude expected of professional in each job and convert them into training package.	4.72	0.66	4.64	0.86	0.148	0.542	NS
6	Through research, update excising training programme in electrical technology for staff to apply in training students.	4.68	0.52	4.76	0.34	0.088	-0.096	NS
7	Use student participation log books to identify the gap between academic programmes and the actual job settings in industrials and include them in curriculum	4.00	0.42	3.60	0.43	0.083	4.810	S
8	Ensure adequate and critical supervision of students' log book	4.54	0.61	4.33	0.40	0.104	2.025	S
9	Standardize and formalize SIWES.	4.16	0.02	4.27	0.46	0.162	0.680	NS

Key

X1	=	Mean of electrical teachers	ES	=	Standard Error
X2	=	Mean of industrial staff	S	=	Significant
SD	=	Standard Deviation	NS	=	Not significant
P	=	0.05	t-table	=	1.96

Data presented in Table 7 revealed that with exception of items 7 and 8, all other items had a calculate t-value table t less than then at 0.05 level of significance and 104 degree of freedom. This indicated that there was no significant difference between the mean response of electrical technology teachers and industrial staff on how SIWES should be organized. Items 7 and 8 and their t-calculated more then the table? This showed that there was a significant different in the mean opinion of the respondents on these two items. With this result, the null-hypothesis (HO_1) was of no significant with exception of items 7 and 8. For these two item (7 and), the null hypothesis was rejected.

Hypothesis 2:

HO_2: There is no significant mean difference between the mean responses of electrical technology teacher and industrial staff on instructional faculties required for effective teaching and learning of electrical technology.

The data for testing the hypothesis is presented in Table 8.

Table 8: The t-test analysis of the mean responses of electrical technology teachers and industrial staff on the instructional facilities required for effective teaching and learning of electrical technology.

S/N	Instructional facilities requires for effective teacher and	X_1	SD_1	X_2	SD_2	t-table	T-cal	Decision
1	Standard workshop with sufficient work stations	4.79	0.42	4.56	1.04	0.148	1.554	NS
2	Pair of pliers	4.00	0.51	3.72	0.62	0.111	2.253	S
3	Hack saws	4.30	0.22	4.22	0.36	0.056	1/429	NS
4	Drilling machines	3.69	0.44	4.28	0.24	0.070	-8.429	NS
5	Electric moors	4.54	1.12	3.88	0.28	0.168	3.929	S
6	Hammers	4.20	0.56	3.86	0.51	0.106	3.208	S
7	Set of screwdrivers	3.89	0.51	4.46	0.42	0.93	-6.148	NS
8	Gimlets	3.74	0.60	4.34	0.50	0.110	-5.455	NS
9	Grinding machines	4/42	1/28	4.22	0.62	0.205	0.976	NS
10	Electric cables	4.31	0.66	3.83	0.78	0.140	3/428	S
11	Electric accessories	3.80	0.46	3.69	0.66	0.109	1.010	NS
12	Power supply units	4.00	1.12	4.07	1.18	0.225	-0.178	NS
13	Illumination wires	4.12	1.04	3.88	0.60	0.172	1.397	NS
14	Work benches	4.02	0.60	4.11	0.36	0.100	-0.901	NS
15	Bench vice	3.66	0.34	4.53	0.41	0.073	-11.934	NS
16	Storage facilities	3.82	0.78	4.24	0.58	0.128	-3.289	NS
17	Hand shears	4.44	0.50	4.02	0.43	0.092	4.565	S

Key X_1 = Mean of electric teacher; SE = Standard error
X_2 = Mean of Industrial staff; S = Significant
SD_1 = Standard deviation; NS = Not Significant
P = 0.05
t-tab = 1.96

The data presented in Table 8 showed that items 1, 3, 4, 7, 8, 9, 11, 12, 13, 14, 15 and 16 had a calculated t-value less than table t-value of 1.96 at 0.05 level of significance and at 104 degree of freedom. This indicated that there was no significant difference between the mean responses of electrical technology teachers and industrial staff on these items. However, items 2, 5, 6, 10 and 17 had a calculated t-value greater than the table-t of 1.96 at 0.05 level of significance difference between the mean response of electrical technology teachers and industrial staff on these items. With this result the null-hypothesis HO_2 of no significant difference was up held for all the items at 0.05 level significance expect for items 2, 5, 6, 10 and 17.

Hypothesis 3:

HO_3: These is no significant mean difference between the opinion of electrical technology teachers and industrial staff on the instructional strategies required for effective teaching of electrical technology.

The data for testing the hypothesis is presented in Table 9.

Table 9: The t-test analysis of the mean responses of electrical technology teachers and industrial staff on the instructional strategies required for teaching electrical technology.

S/N	Instructional facilities required	X_1	SD_1	X_2	SD_2	t-table	T-cal	Decision
1	Teaching students using constructivist using constructivist approach that is helping students to construct their own knowledge	4.69	0.41	4.56	0.50	0.088	1.470	NS
2	Taking students on field trips especially when the necessary equipment and materials for that particular topic are not available	4.00	1.14	3.70	1.18	0.227	1.322	NS
3	Adopting mentor-mentee relationship in imparting electrical skills to students	4.20	0.42	4.02	1.12	0.167	1.144	NS
4	Applying trouble-shooting techniques in teaching certain aspects of electrical technology eg auto wiring.	3.89	1.26	4.22	0.86	0.216	-1.525	NS
5	Teaching electrical skill through project method	4.11	0.54	4.12	0.60	0.111	-0.090	NS
6	Using demonstration method in most practical skills in electrical technology	4.20	0.66	3.78	0.88	0.150	2.808	S
7	Adopting modern teaching methods like meta learning, cognitive apprenticeship in teaching electrical technology to help them develop higher order thinking skills.	4.01	1.12	3.62	1.04	0.213	1.832	NS
8	Teaching electrical skill by giving assignment to the students	3.78	0.92	3.64	1.16	0.202	0.693	NS
9	Encouraging students to engage in evening local apprenticeship in electrical workshops within he community.	3.79	1.14	3.88	0.54	0.182	-0.495	NS
10	Allowing students to practice what they were taught on real job	4.64	0.62	4.62	0.51	0.113	0.178	NS

Key X_1 = Mean of electric teacher; SE = Standard error
X_2 = Mean of Industrial staff; S = Significant
SD_1 = Standard deviation; NS = Not Significant
P = 0.05
t-tab = 1.96

The data presented in table 9 revealed that with exception of items 6 and 17, all the other items on instructional strategies had their calculated t-value less than the table + value of 1.96 at 0.05 level of significance and 104 degree of freedom. This indicated that there was no significant mean difference in the responses of electrical technology teachers and industrial staff on instructional strategies required for teaching electrical technology. However, for item 6 and 17, there was a significant mean difference because, these items had their t-calculated value more than t-table at 0.05 level of significance. This result therefore, showed that the null hypothesis (HO_3) of no significance difference was upheld for all other items in this table with exception of time 6 and 17.

Hypothesis 4:

There is no significant mean difference between the responses of experienced and less experienced electrical technology teachers on how technical colleges could collaborate with the industry for effective teaching and learning of electrical technology.

The data for testing this hypothesis presented in table 10.

Table 10: T-test analysis of the mean responses of experienced and less experienced electrical technology teachers on how technical colleges could collaborate with the industry for effective teaching and learning of electrical technology.

S/N	Instructional facilities.	X_1	SD_1	X_2	SD_2	t-table	T-cal	Decision
1	Forming implanting industrial coordination committees	4.36	0.63	4.38	0.60	0.185	-0.108	NS
2	Forming of advisory committee on partnership between institutions and the industries	2.11	0.46	3.88	0.78	0.203	-8.704	S
3	Involving the industry in training students and staff of institutions in electrical technology programmes	3.02	0.22	2.80	0.36	0.094	2.23	NS
4	Involving professionals industries in part-time lecturing in technical institutions	3.80	1.24	4.01	1.15	0.128	-1.636	NS
5	Establishing a joint in service training for both industrial and institutional staff of electrical technology	2.82	0.70	3.11	1.18	0.308	-0.942	NS
6	Organizing seminars, workshops and conferences for both industrial and institutional staff on electrical technology programmes	4.25	0.62	4.12	0.31	0.138	0.941	NS
7	Setting up short term courses in the industries for updating the skills and knowledge of institutional staff in electrical technology	3.62	1.06	3.78	1.12	0.331	-0.483	NS
8	Allowing industries to examine and make input in the curriculum of electrical technology in institutions	4.00	0.86	4.42	0.73	0.237	-1.775	NS
9	Encouraging industries to provide occupational placement for graduate of electrical technology	3.11	1.14	3.24	0.88	0.299	-0.435	NS

Key X_1 = Mean of electric teacher; SE = Standard error
X_2 = Mean of Industrial staff; S = Significant
SD_1 = Standard deviation; NS = Not Significant
P = 0.05
t-tab = 1.96

The data presented in table 10 revealed that with exception of item 3, other item 3 in the table had their calculated t-value less than the table t-value of 1.96 at 0.05 level of significance and 104 degree of freedom. This indicated that with exception of items there was no significant difference between the mean responses experienced electrical technology teachers and less experienced ones. However, items 3 had its t-calculated higher than t-table. This indicated that there was significant difference between the mean responses of the respondents on this item. With thus result the null-hypothesis (HO_4) of no significant difference was upheld for all the items at 0.05 level of significance except for items 3.

Discussion:

The findings of this study are substantiated in part of findings from several previous studies and part by some theoretical framework of scholars precedence to the research questions and hypotheses in the study. The data presented in table 1 provided answered to research question one. The findings revealed that electrical will be more effectively taught if teachers with NCF (technical), B.Sc (technical), HND (electrical technology) are employed to teach it. These category of teachers were considered qualified and appropriate for teaching the subject (electrical technology) technical colleges. It is well known fact that qualification is a pre-requisite for effective teaching. But because many people use teaching as a stepping some towards their life career, many unqualified teachers are dumped in technical colleges.

Amo –Kehinde (2003) stated that no nation ever rises above the quality of its teachers. That implies that to make teaching and learning of electrical technology effective and hence produce employable graduates qualified teachers in that field of study must be employed to teach it.

The industry in Nigeria had blamed the technical institutions of lack of relevance because the products of technical institutions lack the skill needed to work in the industry. In research question 2, the findings as shown in table 2 indicated all the technical skills relating to electrical technology were found as required skills for employability. It is the skill acquired through technical education that is hoped to make its graduates employable. Supporting this view Alison (2001) stated that vocational and technical education prepares individuals for self-reliance or self –employment and it is the hallmark of a nation's employment and training programme. Commenting on technical skill acquisition Giachino and Gallington (1997) asserted that the more extensive the programme of studies the greater services the school can render to the greater services the school can render to its students. It then follows that if the appropriate and required skills are acquire by electrical technology graduates more graduates will be employable.

Technical skill and habits or attitude necessary to perform well on the job can not be acquired unless of they are inculcated or imparted through effective teaching strategy. The result of this study revealed 10 teaching strategies that can improve the teaching and learning of electrical technology. According to Oliva (1992) a teacher chooses an instructional strategy that best suits interactive and information exchange medium and meaningful experiences, through application of real world problem and data. Supporting the crucial place of instructional strategies in the presentation of a lesson, Ukoha and Eneogwe in Ogwo (1996) stated that instructional strategies are employed by teachers in the presentation of skills, knowledge and appreciations to the learners in the classroom to engage the learners in the tasks involved. This means that effective instructional strategy is the only tool in the hand of effective teacher with which she/he can, stimulate, motivate and sustain the attention of learner so that knowledge, skill and attitude can be imparted. This speaks volume for electrical technology teachers, in that if they employ the required instructional strategies, electrical technology skill, knowledge and attitude can be acquired by the students and hence make them employable on graduation.

The study also revealed the required instructional facilities for effective teaching and learning of electrical technology. Necessary or required facilities are the hub functional technical education. All the instructional facilities listed in this study were identified by the respondents as required, as shown in table 4. Skill which involves manual dexterity can only be acquired by doing. Ogwo (2006) stipulated that learning occurs better through participation. Again, in any classroom, the teacher secures the attention of the learner faster by making the students ready to learn, making learning pleasant and enjoyable and assisting the students to assimilate, exercise or use things being taught by means of appropriate instructional facilities. In technical skill acquisition an environment that is a replica of that of the world of work is a laid down principle. Instructional facilities provide a hands – on – experience for the students. It also serves as a vehicle through which the skill knowledge and attitude is internalized. The required facilities help the students to acquired the required skill and so make them employable.

The data presented in table 5 provided answers to research question five. Findings revealed that amore organized SIWES will be achieved, if closer link and relationship is achieved between the school and the industry. Medium exchange of ideas and information like seminars conferences and workshops between the school and industrial will help highlight areas of SIWES that need attention. Popoola (1999) pointed out that seminar, conferences and workshop involving trainers in the industries and educational institution trainers should be held for both parties so that they might appreciate the mutual benefit that are derivable from a cooperative endeavor. By so doing a more effective marketing of the immense of potential benefits of cooperation will be achieved. He was of the opinion that the industries are profit-maximizing entities, thus, they are reluctant to train students because, training at the industries slows down production process. The industries should be convinced to take a long term view on this investment through seminar, workshop and conference organized to sensitize the industry about the importance of mutual relations with the technical institutions in Nigeria. This findings is in line with that of UNEVOC (2002) which revealed that in most countries of the world were mutual cooperation exists between industry and technical institutions seminars, workshops and conferences were organized regularly to sensitize the industry and for inducing new technologies to students, teachers and industrial employees. It is through cooperation that SIWES supervisors will know how to supervise, what and when to supervise.

Carrying out research to update existing programme in electrical technology for staff to apply in training students as pointed out by the findings of this study is an important activity. There is no doubt that the industries in this changing world of work need extensive research to improve on their activities and services to maximize profit.

Kerre (1999) and Odugbesan (1999) suggested that activities such as organizing research and consultant services by the institution for industries for payment of service and an increase offering of further training for industries employees will be of immense benefit to the school and industries.

The study also found out how technical institutions can collaborate with industries for effective teaching and learning of the skills required by the industries and the world of work. Findings among other things revealed that forming and implementing industrial coordination committee will help in no small measure to improve collaboration between school and industry. These findings are in consonance with the recommendations of

Ighedo (1994) who remarked that career programmes are bound to be defective if there is no input form appropriate personnel in the relevant occupation fields, practitioners in the career option for which training programmes are conceived. Properly constituted programme advisory board have been recognized to be of vital importance as they provide information useful for improving programme performance and consequent public support. He remarked that since the major goals of occupational preparatory programme is to develop a pool of trained technical manpower the cooperation of technical labour can be achieved by setting of industrial advisory committee properly constituted into programme advisory board whose members should include employer and/or employers associations and management personnel, labour organizations, experienced qualified workers in the occupation concern and technical educators. This finding is in lien with suggestion of Dikko (1974) who pointed out that the academic curriculum of educational institutions are important area that requires cooperation between industries and technical institutions. He explained that, to bring about this revolution the institutions must set up industrial advisory committee.

UNEVOC (1996) report on school –industry relationship, showed that in Bostwana, Mexico, Norway, Zimbabe and host of other countries of the world, industrial advisory committee has been used as an instrument to enhance school – industrial relations which has brought about effective cooperation for training of technical manpower between the school and industry. This finding are similar to the finding of Osinem (1990) who found out that advisory committee should be set up to establish cooperation between agro business and agricultural education. The findings also revealed that a better collaboration can be achieved by establishing joint in – service training for both industrial and institutional staff of electrical technology, organizing seminars, workshops and conferences both industrial and institutional staff in electrical technology programmes and even, setting, up short term courses in the industries for updating the skills and knowledge of institutional staff in electrical technology. This is in line with the suggestion Kerre (1999) and Odugbesan (1999), they stated that activities such as payment of services and an increase offering of further training for industries employees will be of immense benefit to the school and industries and thus better training of technical students especially electrical technology students and hence improve their employability. Bilateral character of the interaction between the technical institutions and the industries improves training given to the students and their eventual employability (Dyankov, 2002).

A test of significance was used to test the first hypothesis on how SIWES should be organized. In table 7, the calculated – value for all the items with exception of items 7 and 8, were less than the critical t – value of 1.96. The null hypothesis was accepted for these items. The implication of this finding is that, it helped to confirm the findings made in research question 5. That there is general agreement between electrical technology teachers and industrial staff on SIWES should be organize to help improve employability.

In hypothesis 2 on instructional facilities required for effective teaching and learning of electrical technology presented in table 8, majority of the items had their t- calculated less than table t. therefore, the null hypothesis was not rejected for 12 items while it was not upheld for the remaining five items. Where there are significant differences in their responses such as in items 2, 5, 6, 10 and 17 might be as a result of individual perception on items. On these items, it is noted that electrical technology and institutional staff teachers rated these items high which means to them all these facilities are required for effective teaching and learning fo electrical technology in technical colleges.

A t-test of significance was used to test the third hypothesis on the instructional strategies required for effective teaching of electrical technology as presented in table 9. All the items with exception of items 6 and 17 had their calculated t-value less than the critical t-value of 1.96; hence the null hypothesis wa upheld for all the items in the table with expectation of items 6 and 17. The implication of the findings is that it helped to validate the findings made in research question 3 that there is general agreement between electrical technology teachers and industrial staff in electrical technology industries on instructional strategies that will improve teaching and learning of electrical technology and hence improve employability.

In hypothesis 4 on whether experience is a factor in opinion of electrical technology teacher and industrial staff on how technical colleges can collaborate with the industry for effective teaching and learning of electrical technology, presented in table 10, showed the t-calculated for all the items with expectation of item 3 less than t-critical of 1.96 hence the null hypothesis was upheld for the items in table with exception of item 3. The implication of this findings is that it helped to confirm that the finding made in research question 6, that, there is a general agreement between electrical technology teachers on how technical college could collaborate with the industry for effective teaching and learning of electrical technology. Thus, hypothesis 4 has confirmed that this agreement stands irrespective of experiences.

Conclusion:

On the basis of the findings, it can be deduced that employing qualified electrical technology teachers is one sure way of enhancing effective teaching of the course in technical college. Effective teaching will is supposed to yield effecting learning which will in turn lead to acquiring skill and hence employability.

Evidence from the study also reveals that there are technical skill instructional strategies and facilities that can enhance employability. Most known and common skills, strategies and facilities have been rendered inadequate by rapid technological development that has created the need for new ones. Therefore, to achieve effective training and hence employability, the required technical skill instructional strategies and facilities most be used.

The study equally yielded how SIWES should be organized and how technical colleges can collaborate with the industry for mutual benefit. If SIWES is well organized and cordial collaboration established between the school and industry, better training in skill acquisition will be stabled and hence employability enhanced.

Recommendation:

Based on the findings of this study, the subsequent discussion and their implications, the following recommendations are made:

1) To enhance employability of electrical technology graduates qualified teachers should be employ to teach the course. These qualified teachers should be those with NCE, BSC and HND in electrical technology.

2) Technical skills as well as other necessary skills should be inculcated in electrical technology students. This is to enable them transit to world of work on graduation.

3) Instructional strategies and facilities required for effective teaching and learning of electrical technology should be applied. These should include modern teaching strategies and facilities capable of developing high order skills that can make transition and adaptation to dynamics of technological development possible.

4) Student industrial work experiences scheme show be well organized. This can be done by setting up appropriate committees and advisory boards that can harmonize both activities of the technical college and that of the industry in relation to student training: such collaboration will no doubt enable the student to graduate with the necessary skill that can make them employable.

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