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Research Article

Cable Conduit System Installation Skill Needs of Electrical Craftsmen in the Informal Sector of the Economy for Sustainable Self-Employment in South-South Nigeria

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Abstract

The general purpose of the study was to determine industrial electrical installation skill needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria. One research question and a null hypothesis guided the study. The study was carried out in South-South States of Nigeria using a descriptive survey research design. The population for the study was 417 registered industrial Electrical installation craftsmen and master craftsmen in informal sector of economy in the South-South zone of Nigeria. Census sampling was used because the entire population was studied. The instrument used for data collection was 19-item structured questionnaire developed by the researchers. The instrument was structured using a four-point rating scale for data collection and was face validated by three experts. Two of the experts were from Electrical/Electronic Technology Education in Enugu State University of Science and Technology {ESUT}, Department of Technology and Vocational Education, while the third was from Measurement and Evaluation, Department of Mathematics and Computer Education, ESUT. Cronbach Alpha reliability coefficient was applied to confirm the internal consistency of the instrument. It yielded 0.72 which indicates the instrument was reliable. Mean and standard deviation were used to answer the research questions while t-test was used to test the null hypothesis at 0.05 level of significance. The result showed that all the items under cable conduit system installation skills were all highly needed by the craftsmen and master craftsmen in the informal sector of the economy. In addition, there was no significant difference in the mean scores of craftsmen and master craftsmen at 0.05 level of significance. The study therefore concluded that the identified skill needs should be used to improve teaching-learning process and competency development among the students in technical colleges. The master craftsmen on the other hand should step up apprenticeship training in the informal sector of the economy for self-employment.

Keywords	*Cable Conduit System Installation; Electrical Craftsmen; Skill Needs; Master Craftsmen; Informal sector; Sustainable Self-Employment*
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Introduction

The achievement of sustainable technological and economic development is dependent on the skills and knowledge of human resource that make up the labour force in the nation. According to Mbah (2016), knowledge-based economy is an economic setting in which ideas, skills and cognitive experiences are used to create wealth instead of depending on extraction and processing of natural resources for business. It is imperative to note that not only capital investment is needed for sustainable developments but also skills of the citizens upon which sustainable self-employment is dependent upon.

Skill in a job is the capability of accomplishing a task with precision or certainty, practical knowledge in combination with ability, cleverness and expertness. Dem, Anaele and Achanson (2017) opined that skill is the ability to do something expertly and well in accordance to the set standard or manufacturer's instruction. This can be achieved through repetition of the practice. Eze and Azu (2017) stated that job skills are those skills that are necessary for getting, keeping and doing well on a job. They consist of both academic and practical intelligence of an individual that enables him/her to secure paid and self- employment. The acquisition of skills is relevant in formal and informal sectors of the economy as it provides the needed propelling force in knowledge economy.

The formal sector of the economy consists of the large and small organized private and public organizations; while the informal sector is not organized, irregular and without formality. Alio and Uzor (2010) observed that the formal sector of the economy is officially recognized by all arms of the government of the country, fostered and regulated through tariff protection, trade licenses and quotas, minimum wage, laws among others. In the informal sector, businesses are established without properly defined formal procedures.

The informal sector of the economy forms a linkage with the formal sector especially now the economic situation is affecting the employment and/or job placement opportunities for the youths seeking for non-existing formal or white-collar jobs. It is also observed that many of the youths do not secure the employment they seek for because they lack the necessary skills for it to perform effectively. Alio and Uzor (2010) observed that informal sector houses a lot of job skills which can make an individual to be self- employed and economically independent. Some of the job skills include electrical installation works, electronics repair and maintenance works, motor vehicle maintenance work, auto body repair, building craft, mechanical work, carpentry and furniture among others.

Some of these job skills areas are in line with the National Board for Technical Education (NBTE) guide line for technical college programmes. In electrical installation technology, skills acquisition and training are provided to the students/apprentices to become competent in electrical domestic installation, electrical industrial installation, electrical equipment and appliances maintenance, etc. However, these trainings are given without appropriate guide or needs area with respect to each of the components identified before.

For instance, in industrial electrical installation works, there is inadequate skilled craftsmen to install and maintain electrical installation works in industries (Yaduma & Agbu, 2017). In addition to understanding of technical instruction and working drawing, Amadike and Robinson (2011) identified that the activities or job responsibilities of industrial installation personnel include; cable conduit system installation, power system installation, control system installation, AC and DC machines installation, measurement and instrumentation installation and data cable installation among others. It is expected that adequate acquisition of skills in these areas would not only make the craftsmen to be skillful but also be self-employed even in the changing industrial technology system. Skills in cable conduit system helps one to perform a neat conduit wiring system and protect the wire with adequate mechanical protection. Conduit according to Okafor and Aduhuekwe (2017) is a tube used to protect and route electrical wiring in a building or structure. Conduit in Industrial electrical installation may be of metal, plastic, fiber or fired clay. Skills in conduit wiring can assist a craftsman in performing conduit installation in electrical equipment.

The craftsmen and master craftsmen that have been in the labour market would be of relevance to the study in that they encounter some problems in their areas. Craftsmen are the sub-professionally trained with the skills and practices at technical college level where they are awarded Trade Test Certificate (TTC), Federal Craft Certificate (FCC) or the National Business and Technical Examination Board (NABTEB) Certificate. Alio (2006) in Silas (2016) posited that most of the craftsmen seem to possess low level of formal education and they have poor background knowledge in theoretical concepts which limits their scope for improvement and servicing of new products in

electrical and electronics work activities. Specifically, Alio (2006) noted that most of the electronics craftsmen have difficulty in servicing newer electronic appliances because of their inabilities to interpret circuit diagrams and use modern testing equipment such as digital multimeters, oscilloscope and signal generators. They are not trained to design but to use tools and machines properly to maintain, install and service components of the system in their trade areas.

While the craftsmen are the graduates of technical colleges, the master craftsmen are the craftsmen who have gained advance knowledge, skills and experience in a particular trade or field of engineering and technology (Mbah, 2016). Master craftsmen have additional training and experience more than the craftsmen in repair, maintenance and problem solving in their technical areas. The informal sector of industrial electrical installation works is facing innovations as a result of modern technology which the craftsmen and master craftsmen encounter from time to time. Modern technology requires training in digital related maintenance and installation skills to enable the craftsmen and master craftsmen in informal sector to perform effectively in industrial installation and maintenance work. When the skills in these areas have been identified and made available to the craftsmen, it will help them to develop sound technical and vocational apprenticeship system for training of other craftsmen in cooperative vocational programmes, and for sustainability of informal sector of the economy. Experience of the craftsmen plays a significant role. Eze (2016) stated that the experience of an individual has an impact on the job performance. Good job performances in the informal sector of the economy is very important for sustainable self-employment in South-South Nigeria. South-South Nigeria is one of the geo-political zones of the nation, Nigeria with six States. The Zone is known as oil rich region of the nation with many oil companies, large and small scale industries that need the services of industrial installation and maintenance craftsmen. The youths seem not to have those skills that can keep them away from restiveness. South-South Nigeria has been identified with militancy, kidnapping and restiveness among the youths, Governments need to encourage them to acquire adequate skills so that they can have sustainable self-employment. It is expected that the informal sector of the economy should provide relevant job opportunities for the unemployed people through their acquisition of necessary skills.

Lack of competent craftsmen from technical and vocational institutions affects the quality of job performance of craftsmen in the informal sector and this does create joblessness. This situation influences the economic condition of the State. This condition has negative impact on the economy and also increases the level of unemployment and reduced economic sustainability of the citizens in South-South Nigeria. The industries in the South-South Nigeria require competent craftsmen that will maintain and install industrial machines and equipment.

Statement of the Problem

The available craftsmen lack the needed skills on innovative industrial electrical installation work and maintenance (Amadike & Robinson, 2011). In a related development, most of the craftsmen who were trained through the apprenticeship system, with the conventional and analogue appliances encounter problems when attempting to repair or perform works in electrical/electronic gadgets different from those used during their trainings. This creates a situation aptly described as skill obsolescence which occurs when skills become less valuable or depreciates due to changes in workers themselves or due to changes in production technology and technological improvements. As a result, most of the craftsmen may become unemployed while the few employed may not perform maximally because they lack the desired skills and knowledge needed by the industries. The problems of this study therefore, is the consequence of skill obsolesces among the unemployed craftsmen which do contribute to some social vices such as kidnapping, armed robbery, hacking, political thuggery and other misdeeds to sustain their livelihoods. Therefore, there was need to determine skills in industrial electrical installation needed by electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South, Nigeria.

Purpose of the Study

The main purpose of this study was to determine the Cable conduit system installation skill needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria.

Research Question

The following research question guided the study:

What are the cable conduit system installation skill needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria?

Research Null Hypothesis

The following null hypothesis was tested at 0.05 level of significance.

Ho_1: There in no significant difference in the mean scores of electrical craftsmen and master craftsmen on the cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria.

Research Hypotheses

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

Ho_1: There in no significant difference in the mean scores of electrical craftsmen and master craftsmen on the cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria.

National Board for Technical Education (2004) also stated that the objectives of electrical industrial installation include providing the trainees with skills and knowledge that will enable them undertake factory and industrial installation (conduit, surface and trunk) wiring using appropriate conductors and cables. Industrial installation mainly utilizes high voltage of 415 volts transmitted over a bare aluminum conductors of appropriate dimensions in relation to the type of factories they are meant to serve (Ogwa & Owoh, 2017). However, the study focused on the industrial installation, as it sets to determine the skills needed by the craftsmen and master craftsmen to become self-employed in it. Industrial installation means an installation intended for use in the manufacturing and processing of products involving systematic labour or habitual employment and includes installation in which agricultural and other products are habitual.

The training and acquisition of skills in electrical installation covers areas like installation of cable conduit system, cabling for lighting, power and control installations, measurement and instrumentation, data cable and installation of power system (Beenen, 2019). Considering the objective as stated in NBTE (2004), electrical installation works were designed with the aim of producing competent and productive craftsmen and master craftsmen who should possess the knowledge and practical skills for successful carrier in electrical domestic wiring. In line with this, Akamobi (2015) observed that the relevance of domestic and industrial installation may not be overemphasize. It provides the craftsmen and other trainees with the understanding of the minimum standard and manipulative skills for participation in providing solutions to problems in electrical installation and maintenance works and making economic gain as self-employed professionals.

Cable Conduit System Installation Skills Needs of Electrical Craftsmen in the Informal Sector for Sustainable Self-Employment

Electrical conduit wiring system is the type of electrical wiring and installation works used in modern electrical installation and maintenance works. The conduit wiring system is done by using a conduit, which is simply the channels or tubes that provide path and protection to the electrical wiring (Ogwo & Owoh, 2017). Plastic, fiber, and fired clay are used to make conduits. In a lay man's understanding, conduit wiring is a system where the cables are enclosed in metal or plastic tubes. Among the advantages of conduit wiring are; it is waterproof wiring systems, has a long life, neat and good appearance, alternation is possible, reliable, offer a highly resistant against corrosion and no risk of electric shock. On the other hand, conduit wiring has some negative impact in its design and function in a system. Some of the disadvantages are that it is difficult to install, fault-finding process is very difficult, more time is required for the installation of this wiring system, cost is high, very hard to find a defect in the wiring and very complicated to manage additional connections within the system in the future.

Conduit wiring provides mechanical protection and electrical safety to persons and property and provides convenient and accessible ducts for the conductor. Okafor and Aduhuekwe (2017) opined that a well-designed electrical raceway system has adequate capacity for future expansion and is readily adaptable to changing conditions. Conduit wiring is usually made in such a way that it will comply with the acceptable design standard. Cables for control circuits, interconnection circuits, signaling circuits and bell wiring ought to be identified as required for each particular circumstance. Ogwa and Owoh (2017) stated that cables for power and lighting in installation shall be identified in accordance with International Electro Technical Commission (IEC) 60364. The electrical conduits (where required) shall be distinguished from pipelines or other services using a colour as basic identification.

Cable conduit system installation may be grouped into concealed steel conduit and surface conduit system. Unless otherwise specified in the particular working drawing. Conduit is expected to be concealed with walls, floor slabs false ceiling or other suitable space. Okafor and Adeluekwe (2017) indicated that where surface conduits are specified, they shall be fixed by saddles (spacing) and shall run in a vertical or horizontal directions. These conduit pipes are connected to the accessories. The accessories (conduit boxes, adaptable boxes and metal boxes) should be securely fixed to walls, ceiling and other substantial parts of a structure by means of suitable brass screws correctly spaced. The fixing of these boxes should be independent of fixing of the associated conduits (Kendis, 2011). The skills of fixing the components of the conduit forms the major parts in achieving sustainable self-employment of the craftsmen in the informal sector.

In addition to the above, Beenen (2019) identified that flexible conduits should be used as soon as possible and, in any case, should not exceed a conduit run of two (2) meters. It is advisable to use PVC pliable conduit in place of steel flexible conduit whenever appropriate. In the case of steel conduit, the installation needs to be mechanically and electrically continuous throughout and effectively earthed. The moisture resistant type is not intended for general installation of conduit use but only for connecting motors or portable equipment in damp or wet locations where connection flexibility is needed. In any case, the type and used will depend on the design, types of installation and the wire size.

Joint in steel conduits shall be made by means of a solid coupler into which the adjacent ends of the two conduits shall be inserted to approximately half into it and screwed up tightly in order to make the conduit run mechanically and electrically continuous. In installing this, no threads on either conduit shall be exposed. Kendis (2011) reported that running coupling s shall not be used. In a situation where such a coupling cannot be avoided, approval from the designer must be obtained before it is adopted. In this case, the coupler shall be screwed up tightly onto the short-threaded portion of one conduit, the threaded portion of the mating conduit shall also project appropriately half way into the length of the coupler. Here, the threaded portion of the mating conduit shall also project approximately half way into the coupler. Electrical continuity should be ensured by tightening up a hexagonal locknut against the coupler. Ogwa and Owoh (2017) advised that any exposed threads on either conduit should be painted at least two coats of anti-rust paint.

In spacing of the conduit installation system, Moses, et al. (2017) stated that adjacent or parallel conduits cast in concrete should be separated by a spacing of not less than 25mm so as to allow concrete aggregate to pass and set between them. Where a steel conduit terminates at a metal casing, a coupler and a brass male bush shall be used. The brass male bush shall be screwed into the coupler and adaptor from the inside of the metal casing through a clearance hole drilled in the metal casing to suit the bush. Conduit installation need to be designed to carry acute angle. The internal radius of the bend shall not be less than 2.5 times the outside diameter of the conduit. Kendis (2011) observed that where a steel conduit crossed an expansion joint, special arrangement should be made to allow relative movement to occur on either side of the expansion joint. A separate circuit protection conductor shall be installed to maintain an effective electrical continuity across the expansion joint. The circuit protective conductor shall have a cross-sectional area rated to suit the largest live conductor drawn into the conduit in accordance with IEC 60364. The number of cables drawn into a conduit shall be such that no damage will be caused to the cables or to the conduit during their installation.

Furthermore, conduits running from a distribution board to the final distribution point may each contain all live conductors of a number of final circuits provided that the effective current-carrying capacity of all circuits, upon taking correction factors into consideration. Ogwa and Owoh (2017) stated that the complete trunking installation

shall be mechanically and electrically continuous throughout and effectively earthed. Wiring system in trunking installation should consist of non-sheathed copper cables or sheathed copper cables. Conduit may be corrugated, plain or reinforced. Suitable conduit cutter should be used for cutting rigid PVC conduit. Ability to exercise these conduit skills determine the craftsmen success in informal sector, therefore acquisition of these conduits skills are necessary for sustainability of self-employment.

Method

Research Design

The study adopted a descriptive survey research design. Descriptive survey research design according to Alio (2008) and Nworgu (2015) is one in which a group of people or items are studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group. The survey design specifies how data will be collected and analyzed. This design was used for the study because of the distribution of the respondents' work places and the researcher will make use of polychotomously structured instrument to collect data pertinent to the industrial electrical installation skill needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria. Also, the findings from study would be inferred to the entire population.

Area of the Study

The study was conducted in South-South States of Nigeria. South-South Nigeria is one of the six geo-political Zones of Nigeria with six States. The States are Akwa Ibom, Bayelsa, Cross-River, Delta, Edo and Rivers. Geographically, South-South Nigeria geo-political Zone lies between Latitude 5° 9̇ 20.40 N and 6° 28̈ 8.99̈ E. South-South Nigeria was used for the study because of the growing population and high demand for industrial electrical craftsmen. The geo-political Zone is dominated by the indigenous people of Niger Delta and indigenes of Igbo extraction and they are known for an enterprising, oil rich area and spirit to make wealth. These States have viable industries and high number of craftsmen that can be utilized to improve the Industrial electrical installation skills needs of the informal sector of the economy for sustainable self-employment in South-South Nigeria.

The population for the study was 417 registered industrial installation Craftsmen and master craftsmen in informal industrial electrical installation workshops in South-South Zone of Nigeria (Source; preliminary survey conducted by the researcher, 2020). The population was chosen because they are in the right position to give valid responses to the instrument on the industrial installation skills need of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria.

Instrument for Data Collection

The instrument for data collection was structured questionnaire developed by the researcher based on the research question. The questionnaire titled; Industrial Electrical Installation Skills Need of Electrical Craftsmen in the Informal Sector of the Economy for Sustainable Self-Employment in South-South Nigeria was used. The questionnaire is organized into two parts, Part I and Part II. Part I is focused on the personal data of the respondents, Part II contains questionnaire items pertinent to the research question that guided the study. It contained 19 items on cable conduit system electrical installation skills required by electrical craftsmen in the informal sector of the economy for sustainable self-employment.

Validation of the Instrument

In order to ensure the validity of the instrument, draft copies of the instrument were given to three experts. Specifically, one of them was in Electrical/Electronic Technology Education option of Department of Technology and Vocational Education in Enugu State University of Science and Technology. The other validate is of Electrical/Electronics Technology in the Department of Technical and Vocational Education Ignatius Ajuru University of Education River State. One was given to expert in Measurement and Evaluation from Department of Computer and Mathematics Education in Enugu State University of Science and Technology. The experts also respectively were given the research topic, purpose of the study, research question, hypothesis, and scope of the study and the draft copy of the instrument. They were required to face validate the appropriateness of the items in addressing the

research question, clarity of instrument to the respondents and proper wording of the items. The experts made some corrections which were used to modify the instrument.

Reliability of the Instrument

The reliability of the instrument was determined by administering 20 copies of the questionnaire to10 industrial electrical installation craftsmen and 10 master craftsmen in Anambra State South East Geo-Political Zone. The reason for using these industrial electrical installation craftsmen in Anambra State was that they have the same characteristics with the industrial electrical installation craftsmen in South-South of Nigeria. Data collected from the respondents were analyzed using Cronbach Alpha co-efficient to determine the internal consistency of the instrument. The Cronbach Alpha was used because the items on the questionnaire do not have dichotomous (Yes and No) answer.

Method of Data Collection

A total of 417 copies of the questionnaire was distributed to the respondents for the study with the help of five research assistants who were properly briefed on the content of the questionnaire and its administration to ensure that the questionnaire was properly administered, filled and retrieved. The instrument was retrieved immediately after they are properly filled by the respondents to avoid bias and respondents who were not able to complete the questionnaire items on the spot were followed up through phone calls to ascertain when to return for collection within one week. Out of 417 copies of the questionnaire distributed 396 copies were properly filled returned and used for data analysis, representing 94.96% return rate.

Method of Data Analysis

The data collected from the respondents were analyzed using the mean with standard deviation. The mean was used to answer the research questions while standard deviation was used to check the closeness of their responses. T-test was used to test all the null hypotheses at .05 level of significance and at 394 degree of freedom. The t-test was used because of the sample size. The data collected were analyzed using Statistical Package for Social Sciences (SPSS) based on the statistical tools mentioned earlier.

The decision rule was based on the principle of real limit of the mean, thus;

Very Highly Required (VHR)	3.50-4.00
Highly Required (HR)	2.50-3.49
Slightly Required (SR)	1.50-2.49
Not Required (NR)	1.00-1.49

The null hypothesis was significant where the probability value were less than the .05 significant level at 394 degree of freedom, otherwise the null hypothesis was not significant.

The data analysed were based on the 396 copies of questionnaire returned and thus.

Research Question 1

What are the cable conduit system installation skills required by electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria?

Table 1: Mean Scores and Standard Deviation of craftsmen and master craftsmen on the cable conduit system installation skills required by electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria N=396

S/N	Cable conduit system installation skills required by electrical craftsmen includsability to;	Craftsmen N=160		Master craftsmen N= 236		Overall		Decision
		$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	$\overline{X}_G$	SD_G	
1	design conduit system observing the acute angle in flexible thin-wall or rigid system.	3.18	0.61	3.17	0.61	3.17	0.61	HR
2	attach strand of conductor to flushing line.	3.20	0.57	3.19	0.55	3.19	0.56	HR
3	understand the design standard used in conduit systems.	3.29	0.58	3.28	0.55	3.29	0.56	HR
4	identify conduits for specific work tasks during wiring.	3.22	0.61	3.21	0.57	3.21	0.59	HR
5	use trunking material after wiring.	3.26	0.55	3.24	0.53	3.25	0.54	HR
6	select tools/equipment used in performing quality control jobs.	3.16	0.50	3.16	0.48	3.16	0.49	HR
7	run earth continuity on ducting and trunking.	3.25	0.55	3.23	0.53	3.24	0.54	HR
8	utilize accessories of conduits.	3.52	0.60	3.51	0.60	3.51	0.60	VHR
9	use flexible conduits in connecting motors.	3.19	0.62	3.19	0.62	3.19	0.62	HR
10	prepare data and manufacturing specifications in conduit system installation.	3.14	0.55	3.14	0.57	3.14	0.56	HR
11	demonstrate skills in preparing cable joints	3.23	0.56	3.23	0.59	3.23	0.58	HR
12	join and solder cables in conduit system installation	3.25	0.60	3.24	0.62	3.24	0.61	HR
13	install different cables (data cable, connection cable, fibre optic) through conduit system	3.26	0.61	3.24	0.62	3.24	0.61	HR
14	connect conduits terminals to circuit breakers.	3.26	0.63	3.25	0.66	3.25	0.65	HR
15	understand regulations guiding cable conduit system installation	3.34	0.62	3.33	0.64	3.33	0.63	HR
16	connect different phases in cable conduit installation	3.17	0.68	3.16	0.68	3.16	0.68	HR
17	carry out testing of polarity in an installation	3.30	0.62	3.29	0.62	3.30	0.62	HR
18	draw wires into conduits using fish wire	3.20	0.64	3.20	0.64	3.19	0.64	HR
19	conduct various tests on completed cable conduit installation system	3.24	0.68	3.22	0.69	3.23	0.69	HR
	Cluster Mean/SD	**3.23**	**0.60**	**3.05**	**0.60**	**3.22**	**0.60**	**HR**

Note: X=Mean; SD=Standard Deviation; VHR = Very Highly Required; HR = Highly Required

Data presented in Table 1 shows that the mean score for item 8 was 3.51 indicating very highly required. The remaining 18 items range from 3.14 to 3.33 indicating highly required. This means that the respondents rated the items as the cable conduit system installation skills required by electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria. The overall cluster mean of 3.22 in Table 1 indicates that the items are the cable conduit system installation skills required by electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria. The low standard deviation of 0.60 indicates that the respondents have similar opinion on the items.

Hypothesis 1

There is no significant difference in the mean scores of electrical craftsmen and master craftsmen on the cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria.

Table 2: Summary of t-test Analysis of Mean Scores of electrical craftsmen and master craftsmen on the cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria

Variables	N	T	Df	Sig. (2tailed)	Mean Difference	Std. Error Difference	Decision
Craftsmen	160	.288	394	.774	.19926	.69257	NS
Master Craftsmen	236						

NS= Not Significant

The result of t-test analysis in Table 2 shows that the t-value at 0.05 level of significance and 394 degree of freedom for the 19 items is 0.288 with a significant value of 0.774. Since the significant value of 0.774 is more than the 0.05 level of significance the null hypothesis is not significant. This means that there is no significant difference in the

mean scores of electrical craftsmen and master craftsmen on the cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria.

Discussion of Findings

The findings from this study are discussed in respect to the research questions answered and hypotheses tested for the study.

Cable Conduit System Installation Skills Required by Electrical Craftsmen in the Informal Sector of the Economy for Sustainable Self-Employment

The study showed the cable conduit system installation skills required by electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria. Among the identified cable conduit system installation skills required by electrical craftsmen in the informal sector include ability to; design conduit system observing the acute angle in flexible thin-wall or rigid system, attach strand of conductor to flushing line, understand the design standard used in conduit systems, identify conduits for specific work tasks during wiring, use trunking material after wiring, select tools/equipment used in performing quality control jobs, utilize accessories of conduits, use flexible conduits in connecting motors, prepare data and manufacturing specifications in conduit system installation, demonstrate skills in preparing cable joints, demonstrate skills in preparing cable joints, connect conduits terminals to circuit breakers and install different cables (data cable, connection cable, fibre optic) through conduit system. The findings from this study were in consonance with Okafor and Aduhuekwe (2017) which noted that that performance of tasks in conduit wiring require the acquisition of skills to identify conduits for specific work tasks during wiring, using trunking material after wiring, selecting tools/equipment used in performing quality control jobs, utilizing accessories of conduits and using flexible conduits in connecting motors. Conduit wiring is usually made in such a way that it will comply with the acceptable design standard. The authors pointed that the cables for control circuits, interconnection circuits, signaling circuits and bell wiring ought to be identified as required for each particular circumstance. Ogwa and Owoh (2017) stated that one must learn how to debug, synthesize, analyse electronic circuits. This implies that the emerging cable conduit system installation skills are required by electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria.

The findings of the study showed that there is no significant difference between the mean scores of electrical craftsmen and master craftsmen on the cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment in South-South Nigeria. The implication of the finding was that the status of the respondents (craftsmen and master craftsmen) had no significant influence on the identified cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment. This was supported by Bakare (2016) that status of employees in a similar occasional field had no effect on the cable conduit system installation skills needs of electrical craftsmen in the informal sector of the economy for sustainable self-employment.

Conclusion

Based on the findings from this study the following conclusions are made. The Industrial electrical installation craftsmen in the informal sector needs emerging cable conduit skills for self-employment. Power system installation skills are needed by Industrial electrical installation craftsmen in the informal sector of the economy for sustainable self-employment. This is necessary in order to keep the craftsmen abreast of the skill requirement in the performance of task in industrial electrical installation.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Industrial electrical installation works trade teachers should include the identified cable conduit installation skills, in their instructional delivery.
2. The government and National Board for Technical Education reviewers in technical colleges should be encouraged to integrate industrial electrical installation skills in the training syllabus for students.

Master craftsmen in the informal sector should increase effort in the quality of apprenticeship training provided in industrial electrical installation using the identified cable conduit installation skills. Achieving self-employment in the informal sector is necessary as it helps in promoting economic development and skill formation. It is expected that the informal sector of the economy is expected to provide relevant job opportunities for the unemployed people through their acquisition of necessary skills. Lack of competent craftsmen from technical and vocational institutions affects the quality of job performance of craftsmen in the informal sector and this do create joblessness. This situation influences the economic condition of the States.

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