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PROBLEM SOLVING ABILITIES OF DOMESTIC INSTALLATION STUDENTS IN GOVERNMENT TECHNICAL COLLEGES IN RIVERS STATE

AZONWU, MARTHA E.
Department of Vocational/Technology Education,
Faculty of Technical and Science Education,
Rivers State University, Port-Harcourt

ABSTRACT

The study was carried out to determine the problem solving abilities of Domestic Installation Students of Technical Colleges in Rivers State. Survey research design was adopted for the study. The population for the study was 200 respondents comprise of male and female students of Domestic Installation Students of Technical Colleges in Rivers State. A structured questionnaire was used as instrument for data collection. A research question was formulated for the research. The hypothesis developed was test using chi-square with the aid of statistical package for social sciences (SPSS) Version 23. The study found that students of Domestic Installation posse's problem solving skill to a great extent, the ability to solve problems by possessing some essential skills is of great importance to the employability of students in technical colleges in Rivers State. The researcher, among other things recommended that, the skills identified in this study should be packaged and used to retrain the students of Domestic Installation in Technical colleges; necessary equipment should be donated by the Government or multi-national companies to Technical Colleges in order for students to develop their skills. It was also recommended that teachers of Domestic Installation Students of Technical Colleges in Rivers States should be retrained by government on the implementation of the necessary skills needed in Domestic installation.

KEYWORDS: Problem solving abilities, Domestic installation, Students, Technical colleges, Rivers state.

INTRODUCTION

The global economy has evolved into a knowledge based economy, where skills and human resources have become the driving force for innovation, continued growth and corporate competitive advantage. Today, technology influences pupil's everyday lives, especially in the electrical field and installation of electrical products. Kearns (2001) defines Generic Skills as key competencies that can be used across a large number of different occupation and they provide a platform for the development of good problem tackling ability and also employability skills needed by young people and adults. Generic Skills involve little or no interaction with machines, but help individuals maintain positive social relationships and contribute to the society. Key Generic Skills include communication and interpersonal skills, problem solving skills, using your initiative and being self-motivated, working under pressure and to deadlines, organizational skills, term-working ability to learn and adapt, using mathematical ideas and techniques, using technology, having diversity and difference and negotiation skills. These skills are independent of sector, underpin technical skills and draw on personal attributes. However, the extent by which these skills need to be possessed varies from one occupational grouping to another.

Technical and Vocational Education and Training (TVET) students are expected to have well developed technical skills as well as generic skills that allow for flexibility, adaptability and ability to work across a range of jobs. Generic skills and good problem solving abilities are of great relevance for participation in the new knowledge based economy.

Be it as it may, in Nigeria today, the technological society is continually searching for innovative solutions. Emphases are being placed whether students are able to think analytically, organize and plan effectively, and reflect on outcomes. The ability to tender solutions to problems using creativity reasoning, teamwork and past experiences are often very valuable. There is widespread concern that schools are failing to impart the kind of skills that employers need, furthermore, that certain generic skills have grown in importance in the new knowledge based economy, requiring swift response and sustained attention from educators and administrators to ensure that graduates of technical colleges maintain relevance in the society. It is the concern of this work to analyses the problem-solving abilities of domestic installation students; considerations were given to; what constitutes problem solving in domestic installation, whether the problem-solving is applicable in computer technology, the relevance of problem solving in maintenance and the concepts of importance of domestic installation problem solving in electronics.

OBJECTIVES OF THE STUDY

The objective of this study to ascertain the extent of problem-solving abilities/skills of Domestic Installation Students in Technical Colleges in Rivers State

RESEARCH QUESTION

In order to drive home the objective of this study, the following research question was answered;
To what extent do Domestic Installation Students have problem solving abilities in Technical Colleges in Rivers State?

RESEARCH HYPOTHESIS

Ho: Domestic Installation Students to a high extent do not have problem solving abilities in Technical Colleges in Rivers State.

REVIEW OF RELATED LITERATURE

CONCEPTUAL FRAMEWORK

Solutions to problems can be proffered when there is a well transparent plan on the best route to explore. A sophisticated example might include an electrical installation student, diagnosing the fault on an electrical appliance. The highest level of problem solving is found in the work of a domestic installation student who is in the forefront if work in his field. The literature bearing on problem solving is so voluminous that it is impossible to review even a major part of it. Consequently, the literature reviewed in the following page represents a selection. However, the emphasis was placed on ideas that have been subject to empirical test or which in some way having research support.

CONCEPT OF PROBLEM

Mayer (2003) has reviewed research on thinking and problem solving and concludes that a problem has givens, goals and obstacles. The given state is the current fact, situation or condition. The obstacles are the difficulties that must be surmounted before the given state can be changed. The operations that will convert the current state to the goal state are the solution to the problem. This conception is quite abstract, but is very serviceable for our needs. One of the important characteristics of givens, goals and solutions is their clarity (Reitman; cited by Leonard, 2005). That is, a given state may be well-defined or very ill-defined, as can the end state and the solutions. For example, in the problem of adding a column of numbers the givens, goals, and situations are all well-defined. (In fact, because certain problems such as authentic problems have known algorithms for their solutions, some observers have argued they are not time problems at all. However, real-life arithmetic problems, such as balancing a checkbook or calculating one's income tax, often have many of the complexities and difficulties of other problems.

PROBLEM IDENTIFICATION

Related to the issue of the charity of the definition of a problem is the recognition that a problem exists. That is, some people have skills in discovering problems. (Getzels; 2005) call thus "problem finding". He noted that at one extreme there are presented problems situation where the problem has a known foundation, a routine method of solution, and a recognized solution; here a person needs only to follow established steps to meet the requirements of the situation. At the other extreme there are discovered problem situations where the problem does not yet have a known formulation, a routine method of solution and a recognized solution, here the person must identify the problem itself and there are the established steps for satisfying the requirements of the situation. Problems can vary in charity, both in the given situation, and in the steps needed for their solution. Perhaps the most important type if problems are those that are implicit in situations, and must be "discovered" found or "defined".

PROBLEM SOLVING ABILITIES

Domestic Installation Students who solve problems often make a distinction between algorithms and heuristics. Polya; as cited by Chukwuma (2007) elaborates on the observation that some techniques, if followed carefully guarantee a solution to a problem, while others, and although frequently leading to a correct solution do not always do so. The former, called algorithms are often detailed step-by step procedures. The later, called heuristics are typically general strategies that can be applied in a wide variety of situations when the solutions are uncertain. An algorithm is based on specific knowledge, such as knowing the quadratic equation or the Pythagorean Theorem.

Heuristics can be quite general strategies, such as making a plan for proceeding or checking the accuracy of the basic assumptions, and are usually not based on specific knowledge. The point of discussion is to illustrate that the major cognitive components of problem solving turn out to be present in many situations in which we are not accustomed to honoring successful performance as instances of problem solving. However, the specificity of available knowledge is a matter of degree, not kind. It is seriously misleading to label performance in some situations as problem solving and in other situations in which the same kinds of cognitive processes occur as not involving problem solving. Standard methods are also part of skilled trades. The electrician checks out the circuitry in a house, the mechanic looks for a malfunction etc. All of these procedures follow formula informal rules learned as part of the training for a profession or trade. The point is that students trained in Domestic Installation are taught fairly standardized procedures for solving the typical problems they will encounter in their work. To the extent

the profession or area of skill has procedures that will lead to the correct solution of the problem its practitioner's face, the less will "heuristics" come into play and the more will-knowledge-based "algorithm" come into play.

Most problems are solved by discipline – specific procedure and techniques. This returns us to the central question of whether there are generic problem skills that cut across disciplines or, if there are similarities across disciplines, would the general rule be so broad as to be useless without discipline specific knowledge and detailed procedures? For example, one rule might be to formulate competing hypotheses and seek evidence that would rule out one or all of them. However, to test out the hypothesis that a fuse in a fuse block or solenoid elsewhere is causing a short circuit, a mechanic needs to know how to use a volt-ohm-milliammeter.

The preceding comment suggests that there may indeed be some general skills (i.e. some major features) that are seen in skillful problem solving in a variety of disciplines. However, these skills cannot be implemented without a consideration amount of domain-specific knowledge. All problems, solving abilities are dependent on knowledge and particular procedures so that one aspect of developing expertise in a discipline would then be the acquisition of less general, but more efficient skills.

Various generic skills or abilities are important in domestic installation and across fields. They are outlined below along with some discussion of related abilities.

i. The ability to identify a problem and to state its components: Obviously this depends on familiarity with a domain of problems and experience with similar problems such familiarity allows to solve "chunk" the elements of the problem; i.e. to see meaningful patterns which suggest solutions. The classic models of this behavior are chess masters. Their powers of logic and number of moves they plan ahead are not greater than those of amateurs. However they are immensely superior in their ability to recognize meaningful patterns. One of the outcomes of acquiring skill is to reduce the supposed degree of creativity involved.
"To become an expert in any problem-solving field requires years of study. The effect of this is to transform solution by creative problem solving into solution by the simple retrieval of stored answers. Alan (2004) elaborates that one becomes an expert by making routine many aspects of a problem that require creative problem solving for notices.

ii. The ability to formulate a plan to attack the problem: Again, this ability is based on familiarity with a problem domain and experience with similar problems. The novice in an area will probably have to use such general strategies as means – end analysis, breaking the problem into sub problems or setting sub goals, simplifying and working backwards. The expert will have a number of more domain-specific but more efficient skills. However the more efficient problem solver, whether novice or expert, should have a repertoire of possibly applicable strategies and be able to formulate a plan to use them.

iii. Having requisite knowledge and the ability to recall it and associate relevant features with the current problem: This is quite obvious, one cannot solve problems in domestic electrical installation without having the basic knowledge. However, the capacity to search long-term memory for relevant information probably varies, even among people who are quite knowledgeable in a problem domain. Likewise the ability to associate the knowledge with the demands of the current situation probably varies. Infact, Melnick (2007) considers the creative thinking process as the forming of associate elements into new and useful combinations and Maltman (2008) believes that originality can be trained by increasing the number and remoteness of response. Related abilities are the abilities to see what

additional information is necessary for a situation and the ability to identify and disregard information that is extraneous to the central problem.

iv. The ability to formulate hypothesis about the problem and / or a plan to eliminate various possible solution: within certain domains, especially scientific disciplines, the ability is critical. The inability to use hypothesis, especially the difficulty in dealing with negative instances, is a major shambling block for many problem-solvers. Obviously, the scientific method and experimental design are the most formal expression of this capacity. (However, it is often the case that scientific methodologists who are experts in the techniques of testing hypothesis and statistical methods do not produce hypothesis of their own to examine. To be able to generate hypothesis, it is essential to understand why certain effects are probable. Less formal versions of hypothesis testing are "troubleshooting" diagnosis etc. knowledge and especially understanding of a domain is critical to effective generation of multiple hypothesis and the use of hypothesis testing however as is clear from studies of scientists, some people make much more effective use of their knowledge to create and test hypothesis than others in the same filed.

v. The ability see the sequence of steps of activities and sub-problems needed to reach the solution; fitting the sub -problems into a general pattern: Although this capacity is related to planning described above, this is more related to sequencing activities; i.e. seeing what needs to be done first and how a set of apparently disconnected activities can be organized into a concerted effort at a solution.

vi. The ability to check the attempted solution against the problem's requirements and to see the corrections of the solution: Again, as noted in the classic work of Bloom and Braide (2006) many people have difficulty even seeing why a solution is a solution. Elements of this ability include the capacity to see similarities and difference between the attempted solution and the desired state, being able to sate the requirements of the problem and assess the extent to which the proposed solution meets these requirements. Again, knowledge of a domain allows one to understand why a problem was solved. This understanding in turn may allow construction of more efficient or elegant solution.
Also in the conceptual framework of this research, a good attribute of the problem solving abilities of domestic installation students in technical colleges in Rivers State. Is the ability to troubleshoot electrical faults?

TROUBLE SHOOTING IN PROBLEM SOLVING PROCESS

Electric equipment can malfunction for a Varity of reasons. Mechanical contacts and parts can wear out, wires can overheat and burn open or short out; parts can be damaged by impart or abrasion; etc equipment may operate in a manner far different than it was designed to, or not at all. Typically when equipment fails there is a sense of agency to get it fixed and working again. If the defective equipment is part of an assembly line, the whole assembly line could be down causing unexpected "time off" and lost revenue. If a domestic installation student is at a customer site to repaired equipment. The customer may watch him, knowing that they are paying for every minute the student spends trouble shooting and repairing their equipment.

Trouble shooting is the process of analyzing the behavior or operation of a faulty circuit to determine what is wrong with the circuit. It then involves identifying the defective components and repairing the circuit. Depending on the type of equipment, troubleshooting can be a very challenging task. Sometimes problems are easily diagnosed and the problem component easily visible. Other times the symptoms as well as the faulty component can be difficult to diagnose. A defective relay with usual signs of burning

should be easy to spot, whereas an intermittent problem caused by a high resistance connection can be much more difficult to find.

WHAT MAKES AN EXPERT TROUBLESHOOTER?

One trait of students who are capable of troubleshooting is that they are able to find virtually any fault in a reasonable amount of time. Easy faults, complicated faults, they find them all. Another trait is that they typically replace only the components that are defective. Students of Domestic Installation in Technical Colleges in Rivers State tend to solve problems through troubleshooting and they tend to develop their skills in areas as follows;

i. **Understanding how the circuit works**: This consists of understanding the operation of all the components that are used in the circuit. This could include such components as; push buttons, contactors, various types of switches, sensors etc. Student have been able to determine how the circuit works under normal conditions and what effect changing one of the circuit input has on the circuit operation. For example, having knowledge on what happens to the overall circuit operation when a push button is pressed? Which relays energize, which lights illuminate, does the pump start or stop etc. Also being able to determine what effect a faulty component may have on the circuit operation.

ii. **Using a logical, systematic approach to analyze the circuits' behavior:** This is critical, there are several approaches that trouble-shooters use. They may have different steps or process but they have the following in common. They all approach problems systematically and logically thus minimizing the steps and ruling out trial and error. Also in this research, analysis would be made on the Domestic Installation Skills possessed by Domestic Installation students in Technical Colleges in Rivers State.

DOMESTIC INSTALLATION SKILLS

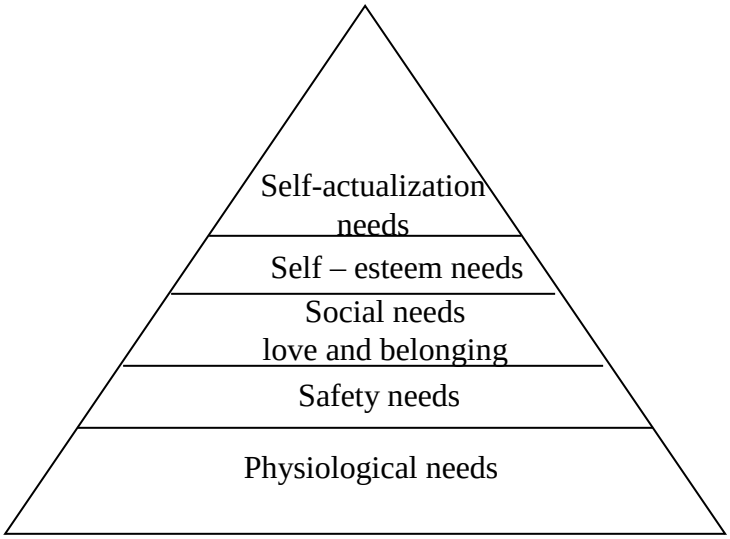
The goals of domestic installation module are to provide the trances with the knowledge and skills to enable him carry out complete electrical installation in a building and its associated components/equipment (NBTE, 2001). Practice required understanding electrical working diagrams, knowing different types of Domestic surface winning and Domestic conduct wiring, principles of protecting electrical devices and install them understand sequence for inspecting and testing domestic installation understand and various types of lamps for illumination and uses.

Electricity services to households are a major leap in technological development. Most household chores that use to be time consuming, energy sapping and dreadful becomes easier, faster and interesting with the use of electrical appliance. Electricity is the choice energy resource for everybody (Ogbuanya, 2005). In the same vein, let's see what other scholars have to say.

THEORETICAL FRAMEWORK

NEEDS THEORIES

The impact that theories of some scholars has made cannot be over emphasized, with their conceptual scheme of motivation which have implication for classroom teacher. Each theme in an individual's life is characterized by the existence of a need in relation to a particular press, a stimulus – situation that has a potential influence upon the life of the organism (Madsen; cited by Nwokike, 2014). Madsen saw need gratification as the basis for most human behaviors, he argued that needs are arranged in a hierarchy (see figure 1 below).



Maslows' Hierarchy of Needs

Thus as the general type of need is satisfied another higher order of need will emerge and become operative in life. The deficiency needs can be satisfied only by others. This shows that an individual can depend on others as need gratification. That of self-actualization, desire to know or understand and aesthetics needs are the being needs. A need therefore develops and motivates behavior only if an individual is expected to a certain press. (Good and Briphy, 1977), hence the desire to satisfy or gratify these needs directs or dictates human behavior.

The above concept of need, have implications, among other things for teacher is general and the electrical teacher in particular. The teacher teaching Domestic Installation should concern himself with efforts to find out how best to structure his instructional activities so that to meet the required skills that the student will be opportune and encouraged satisfying their individual needs. Thus the key concept to bear in mind is the occasional and appropriate involvement of technical college student's interest and instruction. Also systematic exposure to environmental pressure will lead to reasonably strong interest in student skills required for employment.

JOB COMPETITION THEORY

The better or preferable explanation in a theoretical study can best be explained by the job competition theory. Thurow (1975) proposed a theory of job competition which stipulates that based on attained schooling, workers are ranked in order of trainability and the highest ranked worker is assigned to the highest ranked job. Lenven and Oosterbeek (2011), stated that the implication of this is that higher educational attainment raises the possibility, of being employed. Consequently, people go for more skills so as to improve themselves.

Alternatively, the job-competition model of Thurow (1975) considers two queues; a job queen and a person queue. Each job in the job queue has its own skill requirements and productivity characteristics. Individuals competing for jobs also form a queue, their relative position in the queue are determined by a set of characteristics such as education and experience that suggest to the employer the cost of training them in the skills necessary to perform a given job. The higher a person is in the person queue the less in the cost of training and the more likely the person will be to get a job at the head of the job queue. Thus, in order to place them higher up in the person queue, individuals will invest in education

and training, hoping that an additional amount of skills will enhance their chances of getting a good job relative to other.

In view of the fact that well educated individuals are easier to train, and the cost evolved are therefore lower, these individuals are in front of the labour queue instead of competing against each other based on wages, individuals compete for jobs based on background characteristics. The foremost of such characteristics is the level of skills and problem solving abilities possessed. To stand any chance in the highly competitive labour market using the job queue theory, a job seeker has to acquire more skills in order to solve problems that may arise in his field and also to move up the job queue ladder and increase his chances of being employed.

Technology is not just creating new occupations; it is also creating new sets of skills. These skills treated by technology and demanded by industries require adaptability to develop. Central to employability and the development of technological skills is Generic skills. A job seeker who can multitask, solve problems, take initiatives, communicate effectively, work collaboratively in a team setting, has apparently placed his/her self-higher in the job queue and employability index. The more of these skills they possess, the higher their position in the job queue, thus, the higher their value in the labour market.

EMPIRICAL FRAMEWORK

Boyi (2010) conducted a study on workshop safety practice skills required by woodwork students of technical colleges. The major purpose of the study was to determine workshop safety practices skills required by woodwork student of technical colleges in Kogi State, Nigeria. Three research questions and three research questions and three null hypotheses were developed to guide the study. Survey research design was adopted for the study. The instrument used for data collection was a 50-strcutured questionnaire which was face validated by three experts. Split – half technique and cronbach alpha reliability method were adopted to determine the internal consistency of the instrument. All the 80 copies of the instrument were retrieved and analyzed using mean to answer the research questions and t-test statistics for testing the hypotheses. It was found out that all the identified 50 safety practice skills were required by woodwork students for effective functioning in workshops on graduation. It was therefore recommended that the existing curriculum of the technical colleges be reviewed to intensify the teaching of safety to students for their safe practice in the laboratories in the school and in workshop on graduation, and identified safety practices skills in woodwork be packaged and used to retrain already graduated individuals from technical colleges through the skill acquisition centres in the state.

Olaitan and Ede (2009) carried out a study to determine the technical skills improvement needs to the informally trained auto mechanics in maintaining modern automobiles. Three research questions were formulated to guide the study. Structured questionnaire was used for data collection which was duly validated by experts. The population for study comprised by 302 registered auto mechanics in the state and purposive sampling techniques was used to select experienced and 60 less experienced auto-mechanics from twelve semi urban and urban towns in the three sectional district of the state. Cronbach Alpha was used to establish the reliability of the instrument. The data collected were analyzed using the mean and standard deviations for the hypotheses showed that the respondents do not differ significantly in their responses. The findings of the study revealed that the auto mechanics do not possess the requisite technical skills needed for maintaining modern automobile and consequently calls for skill improvement. Recommendations were made based on the result of the study.

Mamman (2008) conducted a research on workshop practice management skill improvement needs of Electricity/Electronics teachers in technical colleges in Adamawa, Bauchi, Gombe State, five research questions formulated, survey instrument of 75 items and reliability co-effiient of 0.98. The findings revealed that the respondents need planning as it is the bedrock on which all other management skills are laid. Organization and skill needs among others with a population of 81 Electricity/Electronics teachers, all questionnaires administered were correctly completed and returned 100% with 19 items were found to be needed. All the above work did not address the required competencies of Electricity/Electrical teachers in Technical College.

Awomug (2007) conducted a research on curriculum improvements requirements in Electrical Installation trade in technical college in Ogun State of Nigeria to achieve this purpose five research questions were developed and a survey instrument of 50 items was used to collect data from the respondents in Ogun State of Nigeria. Mean standard deviation and Cronbach Alpha were used to analyze the data. The result revealed that 16 items of the instrument were considered as appropriate criteria for curriculum improvements requirements in Electrical Installation made. This instrument had reliability co-efficient of 0.088 and could therefore serve as comprehensives requirements in curriculum involvements in Electrical Installation. Base on finding for the study some implications of the study were indicated and recommendation made for consideration.

METHODOLOGY

RESEARCH DESIGN

A survey design was adopted for the study. The design was considered suitable for the study as it employs the study of a small simple to make inference on a larger population.

AREA OF THE STUDY

The study was carried out in Rivers State, whose geopolitical zone is South-South, which is one of the 36 states in Nigeria. Its capital and largest city, Port-Harcourt, is economically significant as the centre of Nigeria's oil industry. Rivers State is bounded on the south by the Atlantic Ocean, to the North by Imo, Abia and Anambra State, to the east by Akwa Ibom State and to the West by Bayelsa and Delta State. Rivers State currently consists of 23 Local Government Areas.

POPULATION OF THE STUDY

The target population of this study comprised of all Domestic Installation Students in the four (4) Government Technical Colleges in Rivers State.

SAMPLE AND SAMPLING TECHNIQUES

The total of 200 students constituted the sample size for the study. The stratified random sampling technique was used in selecting respondents (males and females) and cutting across students in all levels.

INSTRUMENT OF THE STUDY

A structured questionnaire was constructed by the researcher for the purpose of this study. It consisted of four points rating scale of response options with keys provided to elicit answers to the items accordingly. Students were asked to rate the problem solving abilities which they thought were important and the extent practiced in their institution using the keys provided for the response options.

VALIDATION OF THE INSTRUMENT

The questionnaire items were validated by the project supervisor and two other lecturers from the department of science and Technical Education, Rivers State University. Their comments and suggestions were strictly followed for construction of the final instrument.

RELIABILITY OF THE INSTRUMENT

The said instrument was administered to the same group after 2 weeks interval. Pearson product moment correlation coefficient was used to establish the relationship between the test and retest scores.

TECHNIQUES OF DATA ANALYSIS

This will be based on the data collected and survey made. In order to analyze the data obtained with respect to the specific research questions of the study, the researcher used mean statistics to determine the end point or cut-off point. The hypothesis developed was tested using chi-square technique with the aid of statistical package for social sciences (SPSS) version 23.

ANALYSIS AND RESULT

The data for answering research question are presented in the table below.

Table 1: Responses of the respondents on the extent Domestic Installation Students have problem solving abilities in Technical Colleges in Rivers State

S/N	Items	VHE	HE	LE	VLE	N	∑fx	$\bar{x}$	Decision
1	Electrical symbols can be identified effectively	130 (520)	67 (201)	3 (6)	-	200	727	3.63	Accepted
2	Fixing distribution unit for single and poly phase can be done effectively	125 (500)	65 (195)	8 (16)	2 (2)	200	713	3.56	Accepted
3	Selection of PVC cables, armored cables can be effectively done	143 (572)	57 (171)	4 (8)	3 (3)	200	733	3.66	Accepted
4	IEE regulations are always followed effectively	84 (336)	93 (279)	18 (36)	5 (5)	200	656	3.28	Accepted
5	Students can carry a continuity test and insulation test	175 (700)	25 (75)	-	-	200	775	3.87	Accepted
6	Students can select protective circuit breakers and fuses for single/poly phase	72 (288)	83 (249)	38 (76)	5 (5)	200	618	3.09	Accepted
7	Inspection of electrical and mechanical connections to avoid partial contact can be done effectively	129 (516)	69 (207)	-	2 (2)	200	725	3.6	Accepted
8	Students can bend and lay conduits and its accessories effectively	43 (172)	52 (156)	24 (48)	81 (81)	200	457	2.28	Rejected
9	Students can effectively install earth leakage circuit breakers for single and 3-phase dwelling	69 (276)	61 (183)	62 (124)	47 (47)	200	630	3.15	Accepted
10	Students can identify clips, gimlet pins, plugs and wiring materials	172 (688)	21 (63)	1 (2)	6 (6)	200	759	3.7	Accepted

Source: Field Survey, 2017

The data presented in table 1 above revealed that all the 9 out of 10 items have their mean values ranged from 3.09 to 3.87. This showed that the mean value of each item was above the cut-off point of 2.50 indicating that students of Domestic Installation in Technical Colleges in Rivers State have the abilities of carrying out these items, it also means that the students of Domestic Installation in Rivers State in Technical Colleges Possess Problem Solving Skills to a great extent. The table also shows that 1 out of the 10 items (items 8) has a mean value of 2.28. This indicates that students of Domestic Installation in Technical Colleges in Rivers State do not possess that ability.

TEST OF HYPOTHESIS

STATEMENT OF HYPOTHESIS

H_1: Domestic Installation Students to a high extent have problem solving abilities in Technical Colleges in Rivers State.

Ho: Domestic Installation Students to a high extent do not have problem solving abilities in Technical Colleges in Rivers State

Table 2

Observed and expected frequency for testing the extent to which Domestic Installation Students have problem solving abilities in Technical Colleges in Rivers State			
	Observed N	Expected N	Residual
Strongly Agree	118	50.0	68.0
Agree	57	50.0	7.0
Disagree	11	50.0	-39.0
Strongly disagree	14	50.0	-36.0
Total	200		

Source: SPSS version 23

Table 3: Test Statistics

	Observed and expected frequency for testing the extent to which Domestic Installation Students have problem solving abilities in Technical Colleges in Rivers State
Chi-Square	149.800[a]
Df	3
Asymp. Sig.	.000

Source: SPSS version 23

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.

DECISION RULE

Reject Ho if the calculated value of X^2 is greater than the critical value of X^2 read from the data. Do not reject if other

DECISION

Since the calculated value of X^2(149.800[a]) is greater than the critical value (9.49) of $X^{2.}$ Therefore, we rejected the null hypothesis and accept the alternate hypothesis which states that Domestic Installation Students to a high extent have problem solving abilities in Technical Colleges in Rivers State.

CONCLUSION

Based on the findings of the study, it was concluded that there are some Domestic Installation Students in Technical Colleges of Rivers State who lack an essential electrical installation skill which covers skills in bending and lying of conduits and its accessories effectively. The study was carried out and found that the students required those skills in order to enhance their abilities to solve problems in electrical installation. The evolving and dynamic work environment of the knowledge based economy has serious implications for skills training in Technological education, to enter and make progress in the world of work and to keep abreast of changes in job descriptions, Domestic Installation Students need to develop generic skills to increase their employability. People with better technical skill stand a better chance of being employed in the new knowledge based economy where adaptability is key.

RECOMMENDATION

Based on the findings of the study, the following recommendations were made;

- All the skills identified in this study should be packaged and used to retrain the students in an advanced manner.
- Relevant equipment and machines should be given to Technical Colleges for effective implementation of skills for employment in electrical installation.
- Necessary tools and equipment should be donated by the Government or multi-national companies to Technical Colleges in order for students to gain more knowledge and develop their skills.
- Teachers of Domestic Installation should be retrained by government on the implemented of the necessary skills.

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