STRATEGIES FOR IMPROVING COLLABORATION BETWEEN TECHNICAL COLLEGES AND INDUSTRIES FOR SKILLS ACQUISITION IN ELECTRICAL INSTALLATION AND MAINTENANCE WORK IN NIGER STATE

BY

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2016/1/64071TI

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APRIL, 2023

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION, SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF TECHNOLOGY DEGREE (B.TECH) IN INDUSTRIAL AND TECHNOLOGY EDUCATION.

APRIL, 2023

DECLARATION

I, **Usman Kwam Olawale** with matric no. **2016/1/64071TI** an undergraduate student of Department Of Industrial And Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

……. ……..

Name & Matric No Signature and Date

CERTIFICATION

This project has been read and approved as meeting the requirements for the award of B.tech degree in Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna.

Mr. Benjamin Ekhalia _____

Project Supervisor Sign and Date

Dr. Saba, Tswanya Moses _____

Head of Department Sign and Date

_____ _____

External Examiner Sign and Date

DEDICATION

This research is dedicated to Almighty Allah, who gave me the knowledge, understanding, strength, and courage to carry out this work to its completion. I am grateful to my wonderful parent Mr, & Mrs. Usman for their love, encouragement, prayers, and support

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ABSTRACT

The study was carried out to determined ways that could be used for improving collaboration between technical colleges and industries for skills acquisition in electrical installation and maintenance work in Niger State. Survey research design was used for the study. The population for the study was 30 industrial supervisors and 20 technical teachers from selected industries and technical colleges in Niger State. A structured questionnaire was used as instrument for data collection. Three research questions and three null hypotheses were formulated. The responses was used to determine the reliability coefficient of the instrument which yielded 0.796. Mean and standard deviation was used to analyzed the data for answering the research questions while t-test statistics was used to test the hypotheses of no significant different at 0.05 level of significance. It was found that 10 items agreed on the administrative strategies that could improve collaboration between technical colleges and industries for skills acquisition in electrical installation and maintenance work in Niger state, 11 agreed on technical college-based activities that could improve collaboration for skills acquisition in electrical installation and maintenance work in Niger state and industries and 8 on industry-based skills that could improve collaboration between technical colleges and industries for skills acquisition in electrical installation and maintenance work in Niger state. There was no significant difference between the mean responses of industrial supervisors and technical teachers on ways for improving collaboration between technical colleges and industries for skills acquisition in electrical installation and maintenance work. There was no significance difference between the mean responses of industrial supervisors and Technical Teachers on the administrative strategies that could improve school-industry collaboration for skills acquisition in electrical installation and maintenance in technical colleges in Niger state. There was no significant difference between the mean responses of industrial supervisors and technical teachers on the school-based activities that could improve school-industry collaboration for skills acquisition in electrical installation and maintenance work in technical colleges in Niger state. Also there was no significant difference between the mean responses of industrial supervisors and technical teachers on those industry-based activities that would improve school-industry collaboration in electrical installation and maintenance in technical colleges in Niger state. It was recommended that industry based job skills should be included in the curriculum of technical colleges for skills acquisition. Technical teachers instructors should visit industrial enterprises to familiarize themselves with the current technologies, sharing of facilities between technical colleges should be encouraged. Curriculum and syllabus of technical colleges be discussed with many employers as possible on the formation of curriculum objective, selection of curriculum content, organization of the content, selection of learning experience and the organization. Training equipment, machines, laboratories, workshop and ICT library, classroom should be provided to technical colleges by government and philanthropies in the society for effective training.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

The ultimate goal of vocational technical education training is for the acquisition of knowledge, attitude and practical skills for sustainable development. The training of vocational technical education students is based on the production of goods and services that are not only relevant to themselves but to the society (Abu, 2014). Hadromi (2018) stated that the acquisition of life-long practical skills calls for effective and efficient teaching strategies, appropriate evaluation methods and utilization of standard teaching materials; tools, machines, and equipment to ensure the production of desired graduates with practical skills. Other requirements include training manuals and availability of qualified teachers with experiences. However, such categories of staff are also in high demand in the labour market, but could be suitably motivated for part time teaching in technical colleges (Buligina & Sloka, 2016).

Technical Colleges which is an institution that leads to the acquisition of practical skills that enables an individual to be gainfully employed and be self-reliant, Okoro (2000) is regarded as major bedrock in the development programme for any nation because it occupies a unique position in the social and economic development of any nation, especially now that, technology is the language of development throughout the world. It include the study using knowledge, tools, equipment's and materials leading to the acquisition of skills to increase our potentials and solving problems in the ever-changing world we live in. Since technology is regarded as a tool of development and progress of nations, this led to the quest by several countries of the world for the acquisition and utilization of technology. In Nigeria today, this trend was quite recognized by the introduction of the 6 – 3 – 3 – 4 system of education in the early 1980s during the government of Alhaji Shehu Shagari whereby equipment worth billions of dollars were

purchased from Bulgaria and Russia for the take – off of introductory technology programme at junior secondary school levels (JSS) in Nigeria. This was done in order to boost the new discoveries and for proper acquisition of practical skills and the production of technical and vocational teachers. Alaberu, (2014) stated that this practical application of these new discoveries in science and technology results in the transformation of the under developed society to an advanced state. People trained in technical colleges are expected to acquire valuable skills in various areas of specialization among which is electrical installation and maintenance work.

Electrical installation trade is one of the trades through which one can earn a living. Ogbuanya and Ohanu (2017) observed that it widens the intellectual horizon of the individual in the field of electricity as well as equips them with innovative spirit and skills which are necessary for knowledge transfer in the world of work. National Board for Technical Examination (NBTE) (2012) listed the trade related courses under electrical installation and maintenance works to include: - Domestic and industrial installation, cable jointing and battery charging repairs and winding of electrical machines. NBTE also listed trades under domestic and industrial installation as: - surface wiring, conduit wiring, AC and DC machines, maintenance of electrical equipment and installation. Electrical installation also refers to the wires, machinery, apparatus, appliances, devices, materials and equipment used or intended for use by an individual, or group of people of an establishment (Electrical Installation Inspection Act, 2014). Installation is the act of fixing an equipment, device, appliance or structure in position for use. Hence all forms of installation due to wear and tear need maintenance.

Maintenance is the work undertaken to keep or restore an asset to an acceptable standard at an acceptable cost. Olaitan *et al.* (2017) defined maintenance as specific steps and precautions one takes for the care of equipment, machinery or facility which will

ensure that such an item attains its optimal functional utility and lifespan. Weigel (2017) see maintenance as routine function that is carried out on industrial plants, equipment, control devices and measuring instruments to keep them in good operating condition. Maintenance could be routine or preventive, planned or unplanned. In general, maintenance could be corrective or preventive in nature. Therefore, it requires specialized practical technical skills and knowledge in order to meet the requirement of continually changing environment of various industries. The quality of installation and maintenance is largely dependent on the specific skills acquired by the worker.

Skill is needed by electrical installation craftsmen of technical colleges to function well. Since global technology advancement lead to the use of electricity in various homes, offices, industries, institutions as well as many aspect of human endeavour. Federal Republic of Nigeria (FRN), (2013) stressed that individuals trained in electrical installation and maintenance work in technical colleges are expected to acquire skills for manufacturing and servicing in industrial, power generation and utilization. The realization of such goal in technical colleges in most states in the country including Niger state seems to be far below expectation. This may be due to low level of exposure of students in training in practical skills in the school workshops and laboratories (Agu, 2016). Consequently, graduates shy away from taking up employment where they might be called upon to demonstrate their skills. This is due to the fact that the students were not exposed to work-based skills during their learning activities in schools. These lapses resulted in ill-quipped graduates who have remained unemployed. Okorie (2018) observed that many graduates of technical institutions lack the appropriate skills and practical knowledge needed for the production of goods and services in industries.

An industry is a place where people are involved in producing a particular good or providing a particular service. Adebayo (2016) stated that the industry could be a

manufacturing, producing and distributing house or an environment where goods and services are organized by technical experts who possess the technical and vocational competencies for work. Kaduhur (2016) stated that industries always allege that technical colleges teach skills which are too remote from those required. The complaint is that the products of technical colleges are theorists and cannot perform skills for which they are trained until after long period of exposure in the industries. This is due to the fact that the students were not exposed to the work-based skills during their learning activities in schools. These lapses resulted in ill-equipped graduates who have remained unemployed. What then could be responsible for this? UNESCO (2002), in its study conducted on school-industry relation discovered that some countries have found an effective way of training their man-power in new technologies through cooperation between industries and technical institutions. This could equipped the graduates with skills to be employed or become self employed

However, the current situation on school – industry collaboration in Niger state appears not to be well implemented at the technical college level. It seems that students are only taught the courses without any form of collaboration. Although, efforts were made in the past to collaborate with industries through the students supervise industrial training/work experiences scheme SIWES. It was only done during long vacation of one month after their promotion examinations without supervision. This SIWES is not even compulsory with credit unit or mark attached to it to enhance its value. Therefore, there is need to harmonize the activities of the school and that of industries to allow students apply what they learnt in class room to real life situation. The schools and industries should have different based activities in place to train the students in practical skills.

If electrical students are to be adequately skilled and not to remain jobless, it is obvious that there is need for schools and industries to intensify efforts to train students. Scholars,

organizations and concerned Nigerians have advocated for ways that could improve collaboration between technical institutions and industries among which could also be done administratively by government and regulating body. Administration in the context of this work is the meeting point between the schools and the industries, which is the SIWES, established by Industrial Training Fund (ITF), not how the schools and industries administration are done.

Unfortunately, it appears that most graduates of electrical installation in Nigeria, especially in Technical colleges in Niger State lack adequate practical skills to work in the industry or become self- employed. But rather, they prefer to gain employment in white collar job where no practical skill is required. The question is who is to be blamed? Is it the students? Or the teachers' qualification and level of experience (Ogbuanya and Ohanu, 2017). This may be attributed to their inability to learn the required skills in the course of their studies, to enable them enter the world of work. Consequently an avenue should be created for shared responsibilities between work place (industry) and technical institutions for effective training of vocational personnel.

1.2 Statement of the Problem

Electrical Installation and Maintenance Work programme in technical colleges is designed to produce skilled craftsmen who will be able to perform basic functions in electrical installation and maintenance work both in private and public sector (Yunusa, 2013) This calls for the necessity of acquiring high quality practical skills through the use of appropriate strategies to improve collaboration between technical colleges and industries to be complemented with competent and experienced teachers, well-equipped workshops, adequate supply of teaching materials, adequate supervision of practical lessons and proper linkages between technical colleges and local industries.

Unfortunately, practical skills acquisition in Nigerian technical colleges are battling with numerous problems among which are poor teaching strategies. But it appears that the skill acquisition of technical college students in electrical installation and maintenance work in Niger state is inadequate, and below expectation. This may be due to low level of exposure of students for training in practical skills in the school workshops and laboratories, students over population in the class, teacher's incompetence, unfavourable learning environment, inadequate equipped workshops and laboratories for training experience, inadequate tools and training materials, and classroom facilities. This makes the realization of the goal for technical colleges in most states in the country including Niger state to be far below expectation. Therefore, to bridge such gap between theory and practice, school industry collaboration is necessary to assist the learner develops functional skills for the world of work. Most countries have found an effective way to train their technical man power in new technologies through cooperation/collaboration between industries and technical institutions. On the contrary in Nigeria including Niger state inadequacy in collaboration between industries and technical institutions (technical colleges) has resulted in dearth of skilled and technical man power. Even though students industrial works experience scheme (SIWES) which is intended to back up training of students with relevant job experience to expose them to latest technological advances in industries is not well implemented at the National Technical Certificate (NTC) year 1-3 now SS1-3. The students in those grades attend SIWES for only one month without any supervision attached to it. SIWES is not even in the curriculum unlike the one for advance national certificate (ANTC). Hence there is a need to determine the strategies for improving collaboration between technical colleges and industries for skill acquisition in Electrical Installation and maintenance work in Niger State.

1.3 Purpose of the Study

The purpose of the study is to determine the strategies for improving collaboration between technical colleges and industries for skill acquisition in Electrical Installation and maintenance work in Niger State. The specific objectives of the study is to determine;

1. The administrative strategies that could improve technical colleges and industries collaboration for skill acquisition in electrical installation and maintenance work in Niger State.
2. The technical-based activities that could improve technical colleges for skill acquisition in electrical installation and maintenance work in Niger State.
3. The Industry-based activities that could improve technical colleges for skill acquisition in electrical installation and maintenance work in Niger State.

1.4 Significance of the Study

The study would be of benefit to Technical colleges and other vocational training centres and relevant technology centres, industries, students, policy makers and National Board for Technical Education (NBTE) and curriculum planners.

Technical colleges and other vocational training centres would benefit since there have been no guidelines on how collaborative training could be carried out. If the guideline are identified and included in their training program or curriculum it would be used in the training to equip the student's trainee with adequate skills to handle the electrical equipment and machinery of industries in this global technological advancement.

The findings from the study will benefit industries and other sectors of the economy because collaboration between technical colleges and industries could improve the exposure of students to real life experience during their training. Industrial electrical equipment, machineries and tools would be properly handled, operated, managed and

maintained by the students for effective performance and productivity. The efficiencies of many industries would be very high when electrical equipment are functional and when skilled and capable craftsman handle them. Without collaboration, many industries and other sectors of the labour market encounter recast due to poor performance of technical college products. Because training would be organized for them on skill training to meet the need of the industries before they work on and with machines.

Electrical installations students/craftsmen would benefit from the study, since collaboration between schools and industries must have exposed the students to real life situation on industrial equipment, tools, machine to improve their technical skills in line with the present technological advancement. It would also help the students with step-by step training from the industries and to systematically expose them to the latest technological advancement in the industries and to enhance on-the-job school-industry experience.

Policy makers would also benefit from this study as it would help them in making policy that could serve the interest of the skilled personnel. The study could also help policy makers to improve on the policy on education that would strengthen the relationship of technical colleges and industries for human capital development.

National Board for Technical Education (NBTE) as a regulatory body for all technical programmed of technical institutions would find the information on the use of collaboration useful for improving collaboration between technical colleges and industries for skills acquisition. And would use it to guide the technical colleges in the country on how to go about implementing collaboration in the colleges. The information could serve as a basis for recommending to the NBTE possible areas of adjustment in the curriculum of the technical colleges.

1.5 Research Questions

The following research questions were raised to guide the study

1. What are the administrative strategies that could improve technical colleges -industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State?
2. What are the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State?
3. What are the industry-based activities that could improve technical colleges-industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State?

1.6 Scope of the Study

The study is limited to the strategies for improving collaboration between technical colleges and industries for skill acquisition in Electrical Installation and maintenance work in Niger State. The study is limited to Technical Colleges in Niger State. The study is also limited to determine the administrative strategies, technical college based activities and industry based activities collaboration for skill acquisition in electrical installation and maintenance work in technical colleges.

1.7 Hypotheses

The following hypotheses was formulated and tested at 0.05 level of significance

H_{01}: There is no significant difference between the mean responses of industrial supervisors and technical teachers on the administrative strategies that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State.

H_{02}: There is no significant difference between the mean responses of industrial supervisors and technical teachers on the technical college-based activities that

could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State.

H_{03}: There is no significant difference between the mean responses of industrial supervisors and technical teachers on industry based activities that would improve technical college– industry collaboration in electrical installation and maintenance work in technical colleges in Niger State.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Concept of Collaboration

No country can give up on training young people; their technical skills are needed to increase productivity in both the formal and the non –formal sector and to contribute to the economic growth. In the early 2021's, a number of donors, particularly the World Bank began to emphasized the need to extend Private Technical Vocational Education for several reasons; to supplement government limited financing capacity to increase efficiency and innovation to broaden access to technical and vocational education, and to respond more rapidly to the training requirements of high –growth markets (Federal Republic of Nigeria, 2015).

Public Private Partnership and cooperation are critical to the development of high quality of technical and vocational education and Training (TVET) because they allow for regular communication between employers (industries) and TVET providers (technical institutions). This communication also allows employers to have input into the curriculum of TVET and often gives them recruiting tool to attract skilled workers (Grubb, & Lazerson, 2016).

Cooperation between industry and technical institution require new ways of thinking. It requires a considerable formal flexible education system to share the needs, problems; issues, strength and weakness of vocational programme. Cooperation between technical institution and industry also require teachers and administrators to share the internal workings of technology education with representative from industry. Successful collaboration can generate mutual respect and trust among school and industry leaders and allow mutual problems to be solved and share goals reached. These

outcomes may help educational leaders increased access to and improve the quality and efficiency of technical education for employment programme. Scholars in the field of vocational and technical education have continued to call for a better and improved relationship between technical institutions and the industries in which they serve. And there was a called for the need for interaction between the industry and technical institution in order to produce the right type of engineers, technologists, technicians and craftsmen to serve the country. Since the main institution's training facilities are outdated and inadequate, making practical training difficult to meet the modern need trends in the industries (Audu, Abdulkadir and Abdul, 2013). Hence a change of direction is required to close up the widening gap between technical vocational education TVE (Technical colleges graduates and the industry in terms of the requisite skills required for employment in the industries. Therefore it is a matter of necessity that government should enact a law to compel cooperation between technical institutions and the industries to work out a programme for the overall educational development of young Nigerians.

The experience of United State of America is pertinent with regard to industry and educational institution collaboration. Sherman (2016), recalled that the concept of educational institution and industry entering into collaboration is not new. He observed that industries of the united state of America have been cooperating with educational institutions to educate young and adults for more than a century and that the value of industries input into the educational arena is reaching new heights. According to Sherman, this collaboration is viewed as one method of providing innovation and quality for schools of future.

Roth (2014) in his own contribution outlined four ways in which collaboration may benefit schools and industries as follows:

i. Providing other individuals and institution opportunities to perceive another organization's point of view and a chance to win and ally.

ii. Expanding the capacities of participating institutions to deal with the challenges that each entity must meet in its line of operations and helping to build the kind of understanding that create support.

iii. Serving as a means of contributing to quality education programme.

iv. Bringing increased access to knowledge, time, human resources and financial assistance from other sectors in the community as well as reducing the cost and liability of doing business for each participant.

Roth noted that the scope of such relation must be expanded and developed if industry involvement is to be valuable and meaningful rather than merely voluntary or advisory vocational education. He observed that advocates are needed who may help vocational education keep instruction and equipment up to date. In his article it was pointed out that, the congress of the United States of America recognized the critical importance of industry and educational institution partnership and emphasized this concept in the Carl D. Perkins vocational education Act of 2015.One of the nine statement of the purpose of the act was to promote greater cooperation between public agencies and the public sector in preparing individual for employment, in promoting the quality of vocational education in the United States and in making the vocational system more responding to the labour in the state. Emphatic in PL 98-524 was the emphasis that congress placed on industry and educational partnership. For example in a paper presented at the PL 98-524 implementation conference sponsored by the American Vocation Association, Johnson (2015) extracted more than 50 excerpts from the act, that pertained to the collaboration among public and private sector in economic development of the United States.

Clark (2015) reported that one of the education and training thrust of the 1980's has been the emergence of new partnership and cooperation effort between industry and technical institution. According to him, "These partnership and cooperation efforts can work to the benefit of both education and industry program". Similarly, the United States office of Technology Assessment (Gofwen 2017) reported that as the rate of technological change accelerates, both industries and educational institutions are faced with increasing and changing demands for technological related instructions. But in Nigeria, the industries do not have much involvement in training, funding and curriculum development of our technological institutions which are the trademark of industrialization in the development of nations. (Olorufemi and Ashaolu, 2018). Audu et. al., (2013) stated that, there is no link and interaction between the industries and the technological institutions in research activities and manufacturing. Hence, business and industry should become increasingly involved in education and training. One of the ways by which students who involved in vocational technical programmed have gained work experience over the years is the supervised Work Experience (SIWES) being organized by Industrial Training Fund (ITF) in 1973. According to Obanor, and Kwasi (2013), it was established to solve problem of lack of adequate practical skills preparatory for employment in industries by Nigeria graduates of tertiary institutions. The scheme exposes students to industry based skills necessary for a smooth transition from classroom to the world of work. It affords students of tertiary institutions the opportunity of being familiarized and exposed to the needed experience in handling machinery and equipment which are usually not available in the educational institutions. But such opportunities were not made available to students of technical colleges. However no doubt, the SIWES programme has failed, especially for the purpose it was established (Obanor, et. al., 2013). Most students leave school in search of companies to undergo the industrial training program. Some get lucky and get a suitable place of their choice, while others are being frustrated to

stay at home during this period, due to rejection by numerous companies applied as a consequence of funding or population limit in the specific industry. Some will say we are in a world where "connection" is needed to secure a suitable working place. Also some students acquire an industrial training placement that is not related to their course of study, may be they got frustrated of searching for a relevant placement or because of the enormous stipend they would receive. With regard to technical colleges in Nigeria, this scheme appears to have met with a lot of obstacle as stated above at the level of implementation. One of these obstacles was identified by Yabani (2016) as lack of industries in the environment where most technical colleges are located. This perhaps, prompted the need for proper collaboration between industries and technical colleges as obtainable in other parts of the world for relevant skill acquisition.

2.2 Concept of Skill Acquisition

People working in the electrical engineering fields require specialized technical and knowledge in order to meet the requirements of continually changing environment of the various industries. The basic skills are needed to function effectively in the world of work. Technical competence or skills refers to both the theoretical knowledge and practical skills required by the students in the course of their education and training in the technical institutions. It also means to acquaint the graduates with all the basic knowledge and practices which they need to be able to function effectively in the world of work (0zioko, 2017).

Technical competence is also referred to, as the technical skills or industry based skills embedded in the school curriculum (Ominabo, 2015). According to Osuala (2016), technical skills refer to the ability to do or perform an activity in relation to some meaningful work. He further stressed that it presents challenges to the learner by integrating practical work, theoretical knowledge, common sense, observation ability and

encouragement in an occupation. Okorie (2000) asserted that technical skill involve application of mental and physical activities. He also described it as ability to handle objects in a skillful manner. According to him it also enables an individual to develop physical, social, intellectual, economic and emotional capabilities. Okorie further pointed out that an individual who wants to acquire technical skills must possess qualities such as interest, ability, aptitude, practice, personality characteristics and physical qualities.

The acquisition of psychomotor skills is central in vocational technical education. Teachers of technology are therefore expected not only to possess relevant production skills but are also required to know the process of developing psychomotor skills and to focus on them when they teach their own students. This will enable the teachers to set up appropriate training techniques that will guide them in teaching students most effectively and efficiently. An understanding of the process by which psychomotor skills are acquired is a basic condition for effective vocational education training. This process has variously been described by several scientists (Gofwen, 2017). The studies of these authors in the theories of skills acquisition have culminated into what has been known today as the six levels of steps of psychomotor skills acquisition, namely: perceiving, motivating, performing, adapting and innovation.

Perceiving with respect to teaching psychomotor skills, in vocational education, Hammond and Lamar (2018) stressed that the teacher should develop in students a strong desire to possess the manipulative ability. He should be genuinely interested in their skillful performance. It may be desirable or even necessary to have the students see a product that has been produced by a skilled person or in some cases, see the skill performance while it is in progress. This may not only motivate the students, it could develop in them an idea. The student must know why the skill is needed if they want to

possess it and they must feel the need for that ability. Merely telling them (as it is often done in theory lessons) that one ought to know how to do this will not supply a vigorous motive. The authors then concluded that the teacher should see that the students have a clear and correct picture (or perception) of what is to be achieved for motivation; otherwise not much improvement can be achieved.

Motivation in describing psychomotor skills acquisition, Gofwen, (2017) indicated that setting goals and / or solving problem must be the first step in creating motivation in the learner or trainee. Motivation involves satisfaction, needs, rewards, and/or punishment. Initial arousal of an intention seems to be prerequisite which operates as a trigger for further action. There are indications that engaging in an activity and practicing are meaningful only when the learner shows an appropriate indication of motivation. To this, Padelford (2014) states that motivation or incentive seems to be the activator and sustainer of action or thought when acquiring a psychomotor skill. Goals are an essential part of the process of acquiring psychomotor skills. They may be externally directed by another person or internally directed or both. It looks like many psychomotor skills are attained because the learner wants to, or because it feels good to the learner. It was pointed out that various kind of external stimulation and positive internal feedback make possible a high level of achievement in psychomotor skills. In teaching and learning process both internal and external sources of motivation should be employed. Without effective motivation or incentive which may lead to imitation, psychomotor skills would not be acquired or may be poorly attained at best.

Imitation is the stage where the learner is involved in mental manipulation of the form, pattern, or sequence and or mimicking a series of patterns or procedures. In psychomotor skill acquisition, therefore, the learner receives the necessary cues, mentally

manipulates the cues and organizes them into a series of set before attempting to perform a function.

As a practical ways of assisting students to imitate Gall (2017) advised that the teacher should ask the students to name the important steps in doing what they are now ready to learn to do. Furthermore, the teacher should demonstrate the procedure, if it is difficult for the students to understand. Usually in learning from a demonstration, the students watch being done, and then try their hands, at doing what was demonstrated. The teacher should show and explain how to perform each operation step by step. The students should be made to go through the process each trying his hand at it. Performing operation is necessary to acquiring the skill; knowledge and imitation alone cannot develop a manipulative skill.

Performing, by same authors point to the fact that practice is necessary pre-requisite for learning a task and learning process with an increase in the amount of practice. Students in vocational technical education need to be given enough opportunities to practice what they are being thought in theory lessons. Usually, the students will need to develop considerable skill before using operation on a large scale or on a valuable piece of work. To develop this degree of skill, repeated practice exercise may be used which involves various operations and standard of workmanship, Olaitan et al (2017) stated that work experience will be effective in proportion to the specific experience for training habits of doing and thinking through repetitive performance. When such is done students may be able to adopt well.

Adaption is the ability to perform expertly to the ultimate goal of most psychomotor skill training but ideally it should go beyond that. Padelford (2015) recommended that certain psychomotor skill should be adapted to new situations (a sort of transfer of learning). Adapting according to Padelford, involves diagnosing and problem solving and

the added dimension of creativity. Automatic action may be easier to evaluate, but vocational technical teachers should equally emphasize adaptive learning. This stem from the fact that transfer of learning is often required in problem solving situation which is a typical characteristic of the productive or service world. Adoption may bring about innovation.

Innovation is the highest level of psychomotor skill acquisition, which emphasizes the ability to experiment and create new forms of the learned skill. Singer (2017) stressed that the opportunity to express feelings and to gain a feeling of self-actualization are inherent in the innovative act. Innovation presents a challenge and an opportunity for fulfillment and positive self-concept. Expressing and symbolizing need not be restricted to the other fields of Endeavour but equally applicable to the fields of industry. Indeed, in the words of Padelford (2015) "that uniqueness and variation from standard forms characterize creative activity.

Innovation requires all the domains of learning and creativity, and much feedback. The need to provide adequate exposure to students who are enrolled in vocational technical programme in practical skill areas while in school has variously been emphasized by vocational and technical educators. Olaitan et al. (2017) for instance observed that vocational technical education is education for work, hence technical teachers should expose trainees to learning in job related models and in an environment that depicts real work situations.

Ndinechi (2015) stressed the need to strengthen the links between learning in school and the practice of work with the aim of facilitating the transition from school to employment. Ali, in Olaitan et al (2017), remarked that while many subjects may be more theoretical than practical, vocational technical education is more practical than theoretical, hence every effort must be made to expose learners to practical situations where skills and

knowledge could be learned concurrently. Indeed, it may be said that any instructional arrangement that is initiated to facilitate the process of skills acquisition in vocational technical institution is a commendable innovation and a giant step in the right direction. The only way to learn practical skill is by doing. Since the ultimate goal of vocational technical education is preparing an individual for work, any learning situation that promotes the accumulation of theoretical knowledge only at the expense of practical interaction with the objects and equipment is not only operating contrary to the principles of vocational technical education but runs the risk of operating an irrelevant curriculum (Gowon, 2016).

2.3 School – Industry Collaboration for Technological Growth

Technological advancement is on the increase daily in some developed countries such that a piece of equipment becomes obsolete within a given period. Since the world today is a world of technology, the industrial sector in developing countries like Nigeria, being profit oriented are on the lookout for technological advances that could increase their profit margin in less time with greater efficiency. According Netherland Organization for International Cooperation in Higher Education (NICHE, 2010) there are various challenges that TVE graduates are facing in terms of practical skills acquisition, in most developing countries, especially in Nigeria, TVE is narrow in scale, scope, quality and relevance. The programs are not relevant to the requirements of the local labor market, the curricular and syllabi are out- of-date and the institutions lack the tools and equipment essential for practical skills acquisition. Where present, the equipment in workshops and laboratories is often out-of-date, bearing little resemblance to the technologies presently used by industry (NICHE, 2010). Insufficient training equipment leads to trainee overcrowding during practical lessons, with most of the students only observing the demonstration and not having the chance to get some hands-on practice. Due to the fact

that the institutions are poorly resourced, the education and training remain theoretical and the graduates are not considered more skilled than their academic counterparts by the labor market. The institutions thereby acquire a poor image, and produce graduates with lower employability (NICHE, 2010). Olaitan, Nwachukwu, Igbo, Onyemachi and Ekong (2017) remarked that, training institutions in Nigeria as is characteristic of depressed economics are hardly able to review their facilities to keep pace with technological progress like in the other developed countries, the resultant effect of this situation is that the trainees from those institutions enter the world of work only to discover that the equipment with which they were trained have been modified or have drastically deviated from those in which they were trained with. This may be one of the reasons why private employers often contented that University and technical institutions have little or no practical work content (Okorie, 2000). In proffering solution to this problem, Okorie pointed that there should be a better cooperation between training institutions and private employers in order to improve the practical work content in training institutions. Commenting on the same subject, Olaitan (2016) remarked that solution to poor quality of graduates rest with forging closer links and cooperation between industries and training institutions. He further stressed that employers of technical manpower, if they have a stake in the quality of manpower produced, would display greater commitment through job training and financial contribution to promote the quality of training in technical institutions. Such employer according to him having contributed materially; would be more forth coming in exposing trainees on industrial attachment to worthwhile work experiences that would enable them to acquire skills and knowledge in latest technologies and would help to evaluate their job performances.

In the same vein, Okolie (2016), observed that school- industry relation has not been given adequate attention in Nigeria, this he confirmed when he said that “in spite of efforts so far made, the level of cooperation between industries and technical institutions still fall short

of what is envisaged in the policy". However, the interaction between technical institutions of higher learning and industries represents a means of contributing quality technical education programme. Such high interaction is also needed in technical college's education. The more fact that vocational technical education exists to service the industry is enough reason for industry to forge a closed working relationship with the vocational education system. The challenge for industry to succeed in an increasingly competitive world market is contingent upon skilled personnel who learn, grow and adapt to the changing markets and technologies. Clearly, industry has a survival stake in quality of technical education programme.

There are many different types of collaborative ventures between industries and technical institutions. Greenberg (2015) identifies the following six patterns of collaborations as follows.

- Cross training
- Cooperative work study
- Traditional pattern
- Adult and continuing education
- Share facility
- The consultant pattern.

According to Greenberg, most of these patterns overlap: for example a community college may use share facilities while providing training for both industry and educational institutions school trainees. He defined the traditional pattern as a model where an educational institution typically a community college, delivers some or all the training needed by a particular business or industry, this often overlaps with the adult and continue education pattern where a student may receive a degree or certificate while receiving specific job- related training.

The oldest and most common collaborative efforts between industry and educational institutions in the united state according to Greenberg is the cooperative work study programmed that made it possible for students to received part of their education on the job where they can gain skill that are best learned within all the problems and constraints that are part of a private sector operation. This according to Greenberg is a collaborative programme that utilizes a combination of industry and educational institution personnel, facilities and curriculum. Cross training efforts permits both educational institution and industry to pool their resources together for the training of students. Greenberg emphasized that college and university are well suited for the consultant pattern of collaboration.

The united state of America's experience shows that relationship between colleges and industries is very cordial and students can acquire the necessary skills. In recent study conducted by UNESCO (2016), it was reported that most of the countries' technical and vocational system have either formed effective links with industries and commerce or are more moving towards this direction. UNESCO (2016) further stressed that in most of the industrialized countries, training in new technologies is provided within workplace (in some large – scale enterprises) or at the premises of technical and vocational education institutions, which are well equipped with necessary tools to deliver such training.

In cases where technical and vocational education institutions lack sufficient equipment, machinery, hard and software to provide such training, in order to introduce new technologies, some large enterprises and corporations provide the necessary funds or equipment and facilities that are needed for cooperative industry/institutional training in the use of new technologies. In Germany the "Dual System Qualification" in vocational training was introduced (Rainer, 2016). In the Dual System qualification, vocational schools and industry training start at secondary II level. The large part of the learning takes place in the production sector than in school. China too was not left

out in skill acquisition; such education is given to her students at factories, farms and mines before proceeding to higher institutions (Aina, 2016).

In view of what is obtained in these developed countries there is need for collaboration between institutions and industries in the training of our work force for the nation Nigeria particularly in Niger state.

2.4 Administrative Strategies that can improve School-Industry Collaboration

Scholars, organizations and concerned Nigerians have advocated for a number of ways that could improve collaboration between technical institutions and industries. Dikko (2015) observed that an encouraging steps towards establishing relationship between technical institutions and industries is the introduction of the Students Industrial Work Experience Scheme (SIWES) which was initiated by Industrial Training Fund (ITF). ITF was established in 1977 by Federal Government of Nigeria under the enabling decree No. 47, to effective – coordinate all activities of SIWES and to run some short time courses for industries and other related organization.

The scheme is a cooperative skill development-programme or a leading step to collaboration between technical institutions and industries, designed to expose and prepare students for the real work situations they are likely to meet in the field of specialization after graduation from school (Bala, 2017). The students who acquired work experience are more readily to transit from school to the world of work and fit into it. Bala (2017) summarized benefits commonly gain from SIWES as follows:

- It provides an opportunity development of activities needed for proficiency in technical programme.
- It provides a desirable type of motivation and develops students interest in technical programme.

- It develops originality, initiative, self-confidence and managerial ability in students.
- It develops desirable relationship with employers and ability in cooperation with others.
- It helps the students to develop right attitude to work.

SIWES provides students with opportunity to acquire job skills under actual working condition Bala further stressed that SIWES programmes also served as a laboratory where students put in practice the knowledge and skills acquired while in school. Dikko (2015), however, expressed disappointment on the scheme when he remarked that the programme is not adequately meeting the needs of industries personnel as a result of improper coordination due to lack of cooperation between institutions and industries. As a result of that, most industries in the country do embark on retraining the products of the nation's technical institutions.

Olaitan, (2016) noted that the cause of poor placement is partly the inability of technical programme to secure the respect of employers. He added that, constraints suffered by SIWES programme in technical education in the country include poor planning, inadequate fund, poor attitude of students toward the programme, failure to recognize SIWES as a course and failure to evaluate the programme. Furthermore, in the Curriculum and Course Specifications of Electrical Installation and Maintenance Work by National Board for Technical Education (NBTE) Federal Republic of Nigeria (FRN, 2016). Supervised Industrial Training/Work Experience (SIWES) is only account for about 5% of the total hours required for the programme for only advance craft programme, Advance National Technical Certificate (ANTC) in Technical Colleges.

This component of the course which may be taken in industry or in college production unit is compulsory for the full time students. But those at the National Technical Certificate (NTC) year1-3 now SSI-3 do not have such opportunity. Their own SIWES exercise is

not compulsory, and takes place mostly at the second year of their study during long vocation of one month and without any supervision and marks or score attached to it. It can be noted that it is not in the curriculum at the level of technical college education, which is the level of craftsmen production to industries. Bala (2017) emphasized on the need of compatibility between the programmed and the structure of the school curriculum and changing technologies.

The author also said SIWES should be regarded as an integral part of the entire school curriculum and as an extension of the classroom/laboratory instruction. Suggesting ways of proffering solution to this problem, Dikko (2015) noted that since the acquisition of the skills expected from a particular training programmed depends on the relevance of the course contents to the skills required in industries, the academic curricular of the educational institutions therefore are important area that required cooperation between industries and these institutions. The curricular most be relevant to the peculiarities of our situation must address most essentially the current industrial demands with the aim of making our technological institutions graduates relevant to the needs of the industry (Ayofe, Ajetola and Oyewole, 2018). Reddan and Harrison (2010) argue that Technical and Vocational Education (TVE) institutions need to restructure their programs to be responsive to the needs of the job market, especially the industry. To achieve this goal, the TVE curricula must focus on outcomes in terms of the skills, knowledge and attitudes required by industry. To bring out this revolution, Dikko (2015) stated that the institutions must set up industrial committee, similar to Academic Advisory committee. Where the industrial Advisory Committee, exist, the role of this committee should go beyond giving mere approval for courses run by the institution but should monitor the implementation of the approved courses. It is essential that various curriculum and syllabus of the institution be discussed with as many employers as possible. This exercise should be on a continuing basis if the teaching in the institution is to keep pace with rapid

advancement in technology and the changing needs of the industries. A more cordial relation will thus develop between industry and technical institution.

Ighedo (2015) supported the setting up of Advisory committee when he pointed out that it is evident that career programmed is bound to the defective if there is no input from appropriate personnel in the relevant occupational fields. Practitioners in career option for which training programmes are conceived and designed properly constituted into programme Advisory Boards have been recognized to be of vital importance as they provide information useful for improving programme performance and consequently public support. Writing about structure of the Advisory committee, Ighedo noted that, the number and structure of such committee are determined by the areas in which the school is offering training, and that this view is supported by the Oregon guide which prescribed that each curriculum must be served by a separate committee or sub-committee composed as follows:

i. Employees and/or employers association
ii. Experienced qualified workers in the occupation concerned.
iii. Existing post secondary programme involving the same or similar occupational education area.
iv. Labour organization where appropriate.

He further outlines the function of the Advisory committee by saying that it is evident that one of its principal function is to provide input relating to the manpower situation in occupational field. Manpower supply and demand, labour mobility, rate of attrition and potential students interest all of which are vital for projecting effective demand. The importance of correctly assessing potential students' interest was found to be vital for success of the curriculum. Another function of the committee according to him is that the committee will continue to be of immense benefit to curriculum planners. They will

also help to determine and establish for a programmed trainee entry behaviour, training facilities, equipment, identify access community resources and conduct follow-up study of graduates.

In addition, Dikko (2015) recommended that the industrial coordinating units should be well established. These units could be utilized in fostering closer link between institution of learning and the industries. They should be developed and utilized to collect information on problem facing industries, with a view to referring these to relevant departments. Through the activities of these units real-life case study should be readily available to teacher and students as well. The coordinating units should be able to carry out surveys of skills needed by industries around the institutions and be able to advise the appropriate arms of the institutions of learning on areas where updating skills courses should be ran. The units by virtue of their position are industrial liaison office and should be appropriately channeled for guiding students in career/ job placement opportunities. Although, this industrial liaison office has been established in technical institutions and universities, this unit has not been well coordinated to foster effective link and cooperation between institutions and industries. There is need to properly constitute and coordinate the various industrial liaison offices in the technical institutions to facilitate cooperation between industries, and institutions in Nigeria.

In a study conducted by UNEVOC in 2016, various forms of administrative links have been considered effective all over the world to facilitate school and industry cooperation. The report of the study pointed out that in Bostwana, permanent joint consultation exists through advisory committee of government and local levels. In Benin Technical Commissions are responsible for the development of training programmed. Mexico according to the report, has established within the Technical Vocational Education a Directorate a sub-directorate responsible for liaison within industry

and employers. There is an Advisory Council for Vocational Education in Norway according to the report. This Advisory council consists of 13 members 10 out of whom represent work organizations and industries. In each of these countries, there is Vocational Training Committee, the majority of whose members also come from working life. The formation of Advisory Council in Norway has brought about effective cooperation between industries and schools as contained in the report. Industries sponsored the introduction of courses in schools especially in the field of technical and vocational education. Both basic training and upgrading of adults through training, refresher courses take place at the working place on full time or part-time basic. Besides, the correspondence schools, the Norwegian state of Institute of Distance Education are also involved in various TV/Video project for vocational education, in collaboration with the National Broadcasting system.

Based on the report UNEVOC, in Zimbabwe, there is also effective cooperation between industry and schools through the formation of Industrial Advisory Committee consisting of industrialist, employers of technical man power and representative of vocational education. In Zimbabwe, industry and commerce cooperate with institutions and as a result contribute significantly to the development of technical and vocational education through the following endeavors: Each employer contributes 1% of the total wage bill toward vocational training levy. The funds are used to finance various training programmes in the technical institutions. The industries provide on-the-job training to compliments institutional training (e.g. 20% of the practical training is carried out in the institutes and 80% at work places).

One or more of these collaborative links or administrative links used in some parts of the world to facilitate school industry relations as presented by UNEVOC can be adopted by Nigeria to improve the skills of the technical college students. Collaboration in curriculum

content could improve school-industry relation for effective skill acquisition. Oranu (2016) described curriculum as all the intended learning goals, experiences, teaching materials and evaluation techniques which evaluators plan and / or use which students engaged in, under the direction of the school. Anaele (2015) in his own contribution said that a properly planned curriculum must be balanced, that it must recognize the importance of both cultural and occupational needs of the society. If schools are to be more effective to the need of the society, goals and curriculum should be aligned.

Mark (2016) described technical educational curriculum as a product curriculum and recommended model of curriculum planning in technical education development as follows:

Step 1: Diagnosis of need

Step 2: formation of objectives

Step 3: selection of content

Step 4: Organization of content

Step 5: Selection of learning experiences

Step 6: Organization of learning experiences

Step 7: Determination of what to evaluate and the ways and means of doing it (Evaluation).

He reported the view of Finch and Crunkitton (2017) who pointed out that curriculum must be responsive to community needs. They maintained that employers in the community are likewise, obligated to indicate what their needs are and to assist the school in meeting these needs. This assistance according to them might consist of employers serving on curriculum advisory committees. In conclusion, he emphasized that school

industry partnership is often equated with curriculum quality and success. King (2015) in his own opinion noted that drawing a course content of any vocational subject is not prerogatory of the school only, but a joint effort of all sectors who directly or indirectly benefit from the products of vocational education since the vocation oriented curriculum serves the needs of the society. According to him, this implies that industry and private sector should be able to contribute to the curriculum development for vocational technical education programme since they are in a position to know exactly what should be included in the syllabus. Similarly, Olaitan and Ali (2016) opined that selection of content in technical education curriculum involves job identification, task analysis and job clustering. According to them, these activities should be carried out with the industry since the product of technical education seeks employment in the industry. Adebayo (2016) said that education should also be in constant review to cope with the societal needs as they are changing. Hence recognizing the importance of curriculum evaluation, to determine what needs improvement in the curriculum and to provide a basis for effecting that improvement. According to him evaluation is the process of making judgment and initiating the need for modification of the curriculum content. Okoro (2000) stressed that curriculum of the school be constantly revised based on the advice of the curriculum evaluation results provided by the school, the industries and employers of labour. He further described curriculum revision to involve changing the content of courses deleting some topics and introducing others so that the course offering will fully serve occupational requirements and the needs of the students.

While Ogwo and Oranu(2006) defined curriculum in technical and vocational education as the totality of those experience, knowledge, skills and activities systematically planned to educate the students for gainful employment in any chosen occupation or a cluster of occupations. The above view implies that it is important that curriculum should produce training that is in tune with personnel requirement of the industry economy.

2.5 Technical college – Based Activities that can Improve Technical college-Industry Collaboration

UNESCO (2016), in its study conducted on technical college industry relation discovered that some countries have found an effective way of training their man-power in new technologies through cooperation between industries and technical institutions Orikpe (2016) pointed out that industries and technical institutions have different roles to play in technical man power production in Nigeria. He explained that the technical college-based learning activities should involved provision of qualified teachers and suitable classroom facilities and instructional materials for technical college instruction. Dyankov (2016) pointed out that the responsibilities of technical colleges to include:-provision of necessary manpower, allocation of training time table and length of training, selection of adequate and innovative learning content and activities for training, planning cooperation with industry where training should be carried out evaluation of the students to find out the extent to which they have acquire skills they are suppose to acquire and supervision of students during training. Harperin (2015) posits that technical college-based learning focuses on career exploration and counseling of students; selection of a career major a program of study based on high academic and skills standard. Technical colleges should also infuse the entire curriculum with career related activities which will prepare the young people for employment after successful completion of vocational training (Halperin, 2015).

Hudelson 2015 further pointed out that the technical college should assist the student in making transition to a good first job and a high skill. Ranner (2017) defines technical college-to-work transition as the training system in institutions and program that prepare young people for employment after successful completion of vocational education.

Halperin (2015) pointed out that technical college-to-work transition is a locally based education initiatives that brings educators, students, business and industry together to help young people move smoothly from classroom to careers. In essence technical college-to-work transition infuses the entire curriculum with career related activities, rather than offer vocational education as a separate component of the technical college program. It includes cooperative and youth apprenticeship. According to Hudelson (2015) technical college-to-work transition program assist students in making the transitions from technical college to a good first job and a high skill. Hudeleson further maintained that technical college –to – work partnership established between technical colleges and employer assist students in preparing for a high quality jobs requiring technical skills, or further education and training. Technical college –to – work transition provides each student with worksite orientation to build a direct relationship between the student and the employers. Technical college to- work transition referred to as on-the-job training apprenticeship, cooperative education agreement or other programs designed to prepare students to enter the job market (Lueking 2017).

In addition, the technical college should be able to provides each student with worksite orientation, to emphasize that the students have a role and function in the workplace. Egbita (2006) posits that this orientation should include how to listen and take decision, observe safety precautions, ask question, and seek help, act in a professional manner and handle interpersonal conflicts.

This preparation can be provided by the technical college in the classroom instruction, workshops and should be supplement by visits to the workplace to address the connection between the students, upcoming work-based experience and their educational career plans. Various enterprises benefited from the training facilities offered by the vocational and technical training institutions which provided education and upgrading

of their employee through full-time, short courses and part time evening courses or weekend classes, as well as correspondence courses, instructional television programmes or other instructional materials development by teaching personnel at technical and vocational institutions.

2.6 Industry-Based Activities that can improve Technical college-Industry Collaboration

Work-based or industry-based activities or learning is a planned programmed of job training or experience, paid work experiment, workplace mentoring and instructing in general workplace competencies and all aspect of industries. Orikpe (2016) opined that industries should provide work-based learning activities such as internship, on-the-job training, mentoring and cooperative education (industrial attachment) to expose students to the latest technological up-date. According to Dyankov (2016), cooperation between technical and vocational institution and various industrial, agricultural, business and other enterprises has a feature of collaborative work. According to him, educational and training institutions should benefit from the industries on physical facilities, machinery and equipment. Industries should offer "on the job" training at their premises, or assisted to equip educational institutions with valuable equipment and machinery. In addition providing the expertise of their specialists for technical advice on curriculum content or for the design of training programmed, development of software and other instructional materials. Some specialists should be involved in part-time teaching and assist in vocational guidance, counseling, testing and evaluation. Industries should also offer opportunity for some technical teachers and instructors to participate in the research work of industrial enterprises using their high-tech laboratories, or to work on industrial machinery in the production process so as to upgrade their knowledge and skills and keep abreast with new technological development.

In Mauritius, personnel from industries are actively involved in training programme and also serve on the examination board. According to UNEVOC (2016), India and Republic of Korea, Cooperative education has been initiated by the Government. For example, in India, some automobile repairs/maintenance workshops in the state Andra Pradesh offered their facilities for some hands on experience to the students in automotive technicians' courses provided in three Government/private junior colleges during the course of training. In Poland, practical training of technical and vocational students takes place in technical college workshops and in the industries. In Portugal share facilities involved vocational establishments enter into contracted agreement with enterprises determining the rights and the obligations of the two parties and specifying also the entitlement and obligation of each trainee. According to the report in most countries, industries and technical institution cooperate to organize seminar, workshops and conferences for introducing new technologies to students, teachers and industrial employees.

In like manner UNESCO (2016) pointed out that some countries have found an effective way to train technical manpower in new technologies through cooperation between advanced industries and training establishment which involves.

- Use of industrial equipment by trainers and educators on company premises.
- Implementation of joint, cooperative programmed of research and training management system as new and existing technologies converge
- Donation of specific equipment to the training institutions by industrial and commercial enterprises.

Other countries like Thailand and Zimbabwe offered technical and financial assistance to vocational institutions. The project incorporated one day a week training in

the college, followed by four days weekly in the industry. The trainees are accepted after the course of study.

2.7 Review of Related Empirical Studies

Ehizogie (2015) carried out a study on industry-college Relationship. A tool for functional technology. The study investigated the relationship between industries and technical colleges and the effect of such relationship on practical ability of students in Edo state technical colleges. To carry out the study four research questions were formulated. The researcher adopted a survey research method with total population of 810 Foremen, supervisors and managers in 70 industries constituted the targeted sample of one group while the principals and teaching staff of all the technical colleges in Edo State constitutes the target sample of the second group of 360. A questionnaire was used to collect data from foremen, supervisors and managers in 70 industries and all the principals and teaching staff of all technical colleges in Edo State. Mean statistics was used to analyze the data collected while the t-test was employed to test the null hypothesis at 0.05 level of significance. The findings of the study revealed that the factors responsible for non functionality of technical college students were ranked in the order that technical colleges products are not able to match theory and practical, no equipped workshop for adequate practical work, instructors have no practical knowledge and experience, technical college curriculum is not well relevant to the training need of industries, among others. The study recommended that industrial training attachment be extended to students in technical colleges and should be provided with well equipped workshop as well as providing instructors who are practically well groomed with a wealth of industrial experience. The previous study is related to the present study which seeks to determine ways that could be adopted for improving school- industry collaboration for skill acquisition in electrical installation and maintenance. For the simple fact that many

industries are coming up and the increase in technological advancement demands skilled personnel. It is also similar to the present study in its methodology, research design, population, and instrument for data collection and method of data analysis. The research work is related to this present study because it deals with relationship between industries and technical collages for effective practical ability which is centred on skills training of personnel to be employed in the labour market and to be self employed. However, the previous study covered a larger population than the present and did not indicate the specific vocation as in the case of the present study on electrical installation and maintenance work.

Another study was conducted by Amasa (2016) on strategies for improving partnership between industries and technical institutions for effective vocational training in Kaduna –State. The research design was a survey research. The study was design to investigate the current training practices carried out between industries and vocational training schools with a view to evolving strategies that will help in promoting the effectiveness of the partnership. To carry out the study, three research questions and one null hypothesis were formulated. A questionnaire was used to collect data from 198 industrial personnel from 42 industries and 221 technical instructors from 8 vocational training centres and 2 technical schools in Kaduna state representing the whole population of the study. Mean statistics was used to analysed the data collected while the t-test was employed to test the null hypothesis at 0.05 level of significance. The results were analyzed and presented in table and recommendations were made. The findings of the study revealed that partnership strategies were not being utilized and coordination of the existing strategies was poor. The study is similar to the present study in methodology, research design, method of data collection and analysis. It is also related to this study because it investigated the current training practice carried out between industries and vocational institutions for skills acquisition through partnership. But it did not specify

which area of vocational training. However, for this present study it is on improving collaboration between technical colleges and industries for skill acquisition in electrical installation and maintenance work in Niger State.

In a similar vein, Bala (2015) conducted a study on strategies for improving school-industry relations in North –Western Nigeria. The study was designed to identify strategies for improving school-industry relations in North-Western Nigeria. The research design used for the study was descriptive survey design. To achieve the objective of the study, five research questions and two null hypothesis were formulated and questionnaire was used to collect data from 38 wood work technology lecturers/instructors who were currently teaching in 8 tertiary technical institutions and 59 production managers/supervisors who were directly involved in production in the modern woodworking industries. The data collected was analyzed using mean, standard deviation and frequency table. The questionnaire items were analyzed in relation to the research questions using five-point liker scale. The t- test was used to test the null hypothesis at 0.05 level of significance. Some of the findings revealed that National Board for Technical Education (NBTE) and Industrial Training fund (ITF) should set up school industry advisory committee, industries should be involved in the screening and recommendation of courses or trades for students in technical institutions among others. Although the study was on tertiary institutions in Northwestern part of Nigeria comprises of six States (Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zanfara and in woodwork technology but the present study is on collaboration between technical colleges and industries for skill acquisition in electrical installation and maintenances. The previous study is similar to the present because it centered on identifying strategious for improving school – industry relation. The study is also similar in the methodology used. But it differs from the present study on the fact that it is on

woodwork technology in north–western Nigeria but this present study is on electrical installation and maintenance work in Niger State.

Rumbarge (2017) conducted a study on the potential impact of technology on skills requirement for the future jobs. The study adopted the survey method with a population of 1018 with no sampling in Tokyo Japan. A structure questionnaire was used to collect data. The data was analyzed using frequency and percentage scores. The result revealed that new technological innovations are yielding an increased array of new components which are incorporated into modern machineries including the automobile. Even though the study was on automobile manufacturing industry but it is similar to the present study in research design, instrument for data collection and the subject technological innovations with reference to the array of new skills needed to meet up with industrial challenges. Such new skills could be acquired when technical colleges collaborated with industries. But it differs from this present study because it is on improving collaboration between technical colleges and industries for skill acquisition in electrical installation and maintenance work in Niger State.

Elobuike, (2014) carried out a study on Relevance of technical colleges in electrical/electronics and mechanical /automobile program to the needs of industries of Anambra, Ebonyi and Enugu State. The study adopted a descriptive survey design. Population of the study was 154 students. Mean standard deviation and t-test were used to answer the research questions while the hypotheses were tested at 0.5 level of significance. The finding revealed that the production of craftsmen in electrical electronic and mechanical/automobile by technical colleges should be based on the need of automobile industries. The study is related to the present in research design, population, mean standard deviation, t-test. And it is also similar for the simple facts that it deals with the issue of skills needed in industries that are relevant. And how can such

relevant skills are acquired without collaboration or relationship between technical colleges and industries even though no word like collaboration was mentioned.

Odigiri (2016) conducted a study integration of new technological innovation into the curriculum for Nigerian technical college programs. The study adopted a descriptive survey design. Population of the study was made up of 82. Mean standard deviation and t-test were used to answer the research questions. While the hypotheses were tested at 0.05 level of significant. The findings revealed that industries do not rely on training giving to the graduates of the technical colleges. The study is related to the present because it appears that integration of new technological innovation into curriculum of Nigerian technical colleges will be effective when they have good relationship with industries where new innovations are always found. The study is also similar in methodology. However, it was on automobile. The major conclusion derived from these studies was that technical college programs where not well relevant to the training need of industries and that the present partnership strategies were ineffective; hence, there is need for a closer cooperation between industry and technical institutions. However, it is pertinent to note that none of the studies was on improving school-industry collaboration between technical colleges and industries for skill acquisition in electrical installation and maintenance work particularly with reference to administrative strategies that can improve collaboration, school-based activities that can improve collaboration and industry-based activities that can improve school-industry collaboration. This study therefore is an attempt to identify ways that could be used to improve school – industry collaboration between technical colleges and industries for skill acquisition in electrical installation and maintenance work in Niger State.

2.8 Summary of Review of Related Literature

The literature review was under the following: conceptual frame work, reviewed of related studies and related empirical studies. The literature review for this study revealed that technological advancement is on the increase daily in some developed countries such that a piece of equipment becomes obsolete within a given period. Literature also revealed that the solution to poor quality of graduates rest with forging closer links and cooperation between industries and training institutions. It is also stressed that some collaborative issues are; cross training, cooperative work study (industrial attachment) tradition pattern, share facilities and the consultancy pattern. The literature review also revealed that most countries have found an effective way of training their technical man power in new technologies through collaboration. Since new technological innovation are yielding an increase of new components, tools, machinery and equipment, even in the field of electrical installation and maintenance work, there is therefore need to identify ways that could be used to improve school industry collaboration for skills acquisition.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design that adopted for this study is a survey research design where questionnaires will be used as source for opinions of respondents on the strategies for improving collaboration between technical colleges and industries for skill acquisition in Electrical Installation and maintenance work in Niger State. The survey research design will be chosen as an appropriate method for the research as it seeks the views of people about a particular issue that concerns them, give room for researcher to study the group of people and items to source for information from the respondents.

3.2 Area of the study

The study will be carried out in all the seven Technical Colleges in Niger State which are Government Technical college, Minna, Government Technical college Eyagi Bida , Federal Science and Technical college, Shiroro, Government Technical college, Kontagora. Government Technical college, New Bussa. Mamman Technical college, Pandogari and Suleiman Barau Technical College Suleja.

3.3 Population of the study

The total population for this study is fifty (50) which consist of thrity industrial supervisor and twenty (20) technical teachers in Technical colleges in Niger State.

3.4 Sample and Sampling Technique

There is no sampling due to the manageable size of the population.

3.5 Instrument for Data Collection

The questionnaire is the main instrument used by the researcher for the data collected for the study. The questionnaire is structured under four sections. Section A consisting of respondents personal data, while Section B, C and D consists of respondents view on items of questionnaire.

3.6 Validation of the instrument

The instrument was validated by three lecturers in the Department of Industrial and Technology Education, Federal University of Technology Minna. The validator's suggestions and correction was incorporated in the final draft of the instrument in order to ensure that the instrument will be capable of eliciting necessary information that needed for the study

3.7 Reliability of the Instrument

The instrument was administered to 25 respondents who were five (5) Teachers five (5) industrial supervisor in Lokoja L.G.A, Kogi State, which were not part of the study sample to ensure the reliability after modification. The responses was used to calculate the reliability coefficient. A reliability consistency of 0.796 approximately 80% was obtained which implied that the internal consistency of the instrument was high.

3.8 Method of Data Collection

An introductory letter was collected from the Department of Industrial and Technology Education and submitted to various technical colleges to notify and request for their approval before administering the questionnaire. The questionnaire was administered by the researcher with two other trained research assistants.

3.9 Method of Data Analysis

The data collected will be analyzed using mean and standard deviation. The null hypotheses were tested using t-test at 0.05 level of significance.

3.10 Decision Rule

In order to determine the level of acceptance or rejection of any items, a mean score of 2.50 will be used. Therefore any item with a mean responses of 2.50 and above will be accepted and any item with a response of 2.49 and below will be rejected.

The mean of each item was computed by multiplying the frequency of each response mode with appropriate nominal value and divided by the sum obtained under each item with the number of the respondent to an item.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Results

4.1.1 RESEARCH QUESTION ONE

What are the administrative strategies that could improve technical colleges - industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State?

Table 4.1: Mean responses of the respondents on the administrative strategies that could improve technical colleges -industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State.

$N_1 = 30$, $N_2 = 20$

S/N	ITEMS	X_1	X_2	SD_1	SD_2	X_T	Remarks
1	NBTE, ITF and Industries should set up school industry advisory committee to monitor implementation of approved courses in technical colleges	2.62	2.75	0.59	0.74	2.66	Agreed
2	Government should set up coordinating units/boards to carry out survey of skills needed by industries and giving feed back to relevant departments	3.13	3.14	0.39	0.40	3.13	Agreed
3	Government should establish industrial liaison offices/coordinating units in technical colleges	2.19	2.22	0.55	0.50	2.20	Disagreed
4	Government should establish laws that will encourage industries and technical colleges to develop training programmes that can meet their internal needs	2.23	2.02	0.49	0.32	2.16	Agreed
5	Industries should be encouraged to develop training programmes in technical colleges in relation to their internal needs	2.50	2.24	0.54	0.51	2.51	Agreed
6	Industrial based job skills should be included in the curriculum of technical colleges for skill acquisition	2.12	2.00	0.48	0.49	2.08	Disagreed
7	Industries should be involved in screening and recommending courses or trades in technical colleges	2.32	2.14	0.53	0.45	2.26	Disagreed
8	Government should encourage industries to establish vocational and apprentice training centres in their area of operations	3.26	3.08	0.59	0.48	3.20	Agreed

9	ITF, on regular basis should organize training programmes aimed at upgrading the knowledge of technical personnel	2.19	2.08	0.49	0.34	2.15	Disagreed
10	ITF and NBTE should organize seminars, workshops and for training personnel	2.79	2.77	0.54	0.76	2.78	Agreed
	Grand Average	**2.54**	**2.44**	**0.52**	**0.50**	**2.50**	

Key

N_1 = Number of industrial supervisor

SD_1 = Standard deviation of industrial supervisor

N_2 = Number of Teachers

SD_2 = Standard deviation of Teachers

X_1 = Mean of industrial supervisor

X_2 = Mean of Teachers

X_t = average mean of industrial supervisor and Teachers

The result presented in table 4.1 above revealed that the groups of respondent agreed with the items 1,2,4,5,8 and 10 with the average mean ranging from 3.20 -2.51 and disagreed with items 3,6,7 and 9 with mean scores ranging between 2.08- 2.26, on the administrative strategies that could improve technical colleges -industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State.

4.1.2 Research Question Two

What are the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State?

Table 4.2

Mean response of respondents on the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State.

N_1 = 30, N_2 = 20

S/N	ITEM	X_1	X_2	SD_1	SD_2	X_T	Remarks
1.	Jointly organizing seminars, workshops by technical colleges and industries can improve school-industry collaboration	3.33	3.00	0.65	0.90	3.10	Agreed
2.	Industries and Technical Colleges sharing of facilities can improve school-industry Collaboration	2.92	2.54	0.67	0.75	2.65	Agreed
3.	Provision of programme of studies based on high academic standard can improve school-industry collaboration	2.67	2.43	0.89	0.79	2.50	Agreed
4.	Involvement of industries in evaluating students relevant learning experiences acquired in the technical colleges can improve school-industry collaboration	2.83	2.43	0.72	0.74	2.55	Agreed
5.	Organizing cross training between industries and technical institutions personnel can improve school industry collaboration	2.83	2.68	0.72	0.95	2.73	Agreed
6.	Counseling of students for career exploration in specific vocation relevant to industries can improve school industry collaboration	2.92	2.54	0.67	0.69	2.65	Agreed
7.	Involving industries in setting and marking of practical examinations in technical colleges can improve school-industry collaboration	2.92	2.96	0.67	0.79	2.95	Agreed
8.	Industrial training attachment for students in industries can improve school industry collaboration	2.50	2.32	0.67	0.72	2.38	Disagreed
9.	Engaging electrical engineering professionals in industry in part time teaching in technical colleges can improve school industry collaboration	2.67	2.36	0.89	0.56	2.45	Disagreed
10.	Inviting guest speakers from industry to deliver lectures in technical colleges can improve school industry collaboration	2.83	3.21	0.94	0.83	3.10	Agreed
	Grand Average	**2.84**	**2.65**	**0.75**	**0.77**	**2.71**	

Key

N_1 = Number of industrial supervisor

SD_1 = Standard deviation of industrial supervisor

N_2 = Number of Teachers

SD_2 = Standard deviation of Teachers

X_1 = Mean of industrial supervisor

X_2 = Mean of Teachers

X_t = average mean of industrial supervisor and Teachers

The result presented in table 4.2 above revealed that the groups of respondent agreed with all the items with the average mean ranging from 3.10 – 2.50, except item 8 and 9 with the mean score 2.38-2.45 on the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State.

4.1.3 Research Question three

What are the industry-based activities that could improve technical colleges-industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State?

Table 4.3

Mean responses of the respondents on industry-based activities that could improve technical colleges-industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State

N_1 = 30, N_2 = 20

S/N	ITEMS	X_1	X_2	SD_1	SD_2	X_T	Remarks
1.	Acquisition of latest skills on principal components of MVM	2.99	3.14	0.58	0.75	3.04	Agreed
2.	In depth knowledge on principle of operation of modern days vehicle	3.09	3.33	0.47	0.55	3.17	Agreed
3.	Specializing on a particular area of automobile, e. g. Braking system or	2.97	2.86	0.41	0.69	2.93	Agreed

	Transmission system.						
4.	Introduction of modern method of trouble shooting and routine maintenance.	3.06	3.22	0.28	0.50	3.11	Agreed
5.	In service training on the usage of detectors and test equipments newly introduced due to latest innovations	3.04	3.06	0.20	0.47	3.05	Agreed
6.	Providing a bay where students can stand conveniently to work under a vehicle instead of lying on the ground.	2.97	2.96	0.44	0.53	2.97	Agreed
7.	Provision and usage of high technology equipment for testing, diagnosis and repair of automobiles in the school workshop	3.18	3.10	0.58	0.67	3.15	Agreed
8.	Adapting to the evolving scientific, technological and socio-economic changes by coordinating with current and projected training action	3.01	3.02	0.39	0.58	3.01	Agreed
	Grand average	**3.04**	**3.09**	**0.42**	**0.59**	**3.05**	

Key

N_1 = Number of industrial supervisor

SD_1 = Standard deviation of industrial supervisor

N_2 = Number of Teachers

SD_2 = Standard deviation of Teachers

X_1 = Mean of industrial supervisor

X_2 = Mean of Teachers

X_t = average mean of industrial supervisor and Teachers

The result presented in table 4.3 above revealed that the groups of respondent agreed with all the items with the average mean scores ranging from 3.17 – 2.93 on the industry-based

activities that could improve technical colleges-industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State

4.1.4 Hypothesis One

There is no significant difference between the mean responses of industrial supervisors and technical teachers on the administrative strategies that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State.

Table 4.4

t-test analysis of the respondents on the administrative strategies that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State.

S/N	Respondent	**N**	$\overline{X}$	**SD**	**d.f**	**t-cal**	**t-critical**
1	Industrial supervisor'	30	2.54	0.52	48	-0.68	1.98
2	Teachers	20	2.44	0.49			

Key

N_1 = Number of Industrial supervisor'

SD_1 = Standard deviation of Industrial supervisor'

N_2 = Number of Teachers

SD_2 = Standard deviation of Teachers

t = t-test value of Industrial supervisor' and Teachers

Df = degree of freedom

NS = Not significant

The analysis in table 4 shows that the t-cal values of all the 10 items are needed. There was no significant difference between the mean responses of industrial supervisors and technical teachers on the administrative strategies that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State. Therefore the null hypothesis was accepted.

4.1.5 Hypothesis Two

There is no significant difference between the mean responses of industrial supervisors and technical teachers on the technical college-based activities that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State.

Table 4.5

T-test analysis of the respondents on the technical college-based activities that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State..

S/N	RESPONDENT	**N**	$\overline{X}$	**SD**	**d.f**	**t-cal**	**t-critical**
1	Industrial supervisor'	30	2.84	0.75	48	-1.15	1.98
2	Teachers	20	2.65	0.77			

Key

N_1 = Number of Industrial supervisor'

SD_1 = Standard deviation of Industrial supervisor'

N_2 = Number of Teachers

SD_2 = Standard deviation of Teachers

t = t-test value of Industrial supervisor' and Teachers

df = Degree of freedom

NS = Not significant

The analysis in table 4 shows that the t-cal values of all the 10 items are needed. There was no significant difference between the mean responses of industrial supervisors and technical teachers on the technical college-based activities that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State. Therefore the null hypothesis was accepted.

4.1.6 Hypothesis Three

There is no significant difference between the mean responses of industrial supervisors and technical teachers on those industry based activities that would improve technical college– industry collaboration in electrical installation and maintenance work in technical colleges in Niger State.

Table 4.6

T-test analysis of the respondent on industry based activities that would improve technical college– industry collaboration in electrical installation and maintenance work in technical colleges in Niger State.

S/N	RESPONDENT	N	$\overline{X}$	SD	d.f	t-cal	t-critical
1	Industrial supervisor'	30	3.04	0.42	48	0.31	1.98
2	Teachers	15	3.09	0.59			

Key

N_1 = Number of Industrial supervisor'

SD_1 = Standard deviation of Industrial supervisor'

N_2 = Number of Teachers

SD_2 = Standard deviation of Teachers

t = t-test value of Industrial supervisor' and Teachers

S = Significant

NS = Not significant

The analysis in table 4.6 shows that the t-cal values of all the 8 items are needed. There was no significant difference between the mean responses of industrial supervisors and technical teachers on those industry based activities that would improve technical college–industry collaboration in electrical installation and maintenance work in technical colleges in Niger State. Therefore the null hypothesis was accepted.

4.2 Summary of findings

1. Most of the respondents agreed on the administrative strategies that could improve technical colleges -industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State.
2. Most of the respondents agreed on the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State
3. Most of the respondents agreed on the industry-based activities that could improve technical colleges-industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State
4. There was no significant difference between the mean responses of industrial supervisors and technical teachers on the administrative strategies that could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State.
5. There was no significant difference between the mean responses of industrial supervisors and technical teachers on the technical college-based activities that

could improve technical college collaboration for skill acquisition in electrical installation and maintenance work in technical colleges in Niger State.

6. There was no significant difference between the mean responses of industrial supervisors and technical teachers on those industry based activities that would improve technical college– industry collaboration in electrical installation and maintenance work in technical colleges in Niger State

4.3 Discussion of Result

The findings on research question one revealed that Most of the respondents agreed on the administrative strategies that could improve technical colleges -industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State. The findings of the study corroborate with the study of Ehizogie (2015) carried out a study on industry-college Relationship. A tool for functional technology. The study investigated the relationship between industries and technical colleges and the effect of such relationship on practical ability of students in Edo state technical colleges. The findings of the study revealed that the factors responsible for non functionality of technical college students were ranked in the order that technical colleges products are not able to match theory and practical, no equipped workshop for adequate practical work, must instructors have no practical knowledge and experience, technical college curriculum is not well relevant to the training need of industries, among others. The study recommended that industrial training attachment be extended to students in technical colleges and should be provided with well equipped workshop as well as providing instructors who are practically well groomed with a wealth of industrial experience.

The findings on research question two revealed that most of the respondents agreed on the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State. the findings is inline with

Amasa (2016) on strategies for improving partnership between industries and technical institutions for effective vocational training in Kaduna State. The research design was a survey research. The study was design to investigate the current training practices carried out between industries and vocational training schools with a view to evolving strategies that will help in promoting the effectiveness of the partnership. The findings of the study revealed that partnership strategies were not being utilized and coordination of the existing strategies was poor. The study is similar to the present study in methodology, research design, method of data collection and analysis. It is also related to this study because it investigated the current training practice carried out between industries and vocational institutions for skills acquisition through partnership. But it did not specify which area of vocational training.

The findings on research question three revealed that most of the respondents agreed on the industry-based activities that could improve technical colleges-industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State. The study is inline Rumbarge (2017) conducted a study on the potential impact of technology on skills requirement for the future jobs. The result revealed that new technological innovations are yielding an increased array of new components which are incorporated into modern machineries including the automobile. Another study supported the findings by Elobuike, (2014) carried out a study on Relevance of technical colleges in electrical/electronics and mechanical /automobile program to the needs of industries of Anambra, Ebonyi and Enugu State. The study adopted a descriptive survey design. Population of the study was 154 students. Mean standard deviation and t-test were used to answer the research questions while the hypotheses were tested at 0.5 level of significance. The finding revealed that the production of craftsmen in electrical electronic and mechanical/automobile by technical colleges should be based on the need of automobile industries.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Procedures Used

The study adopted survey research design. The population for the study was 50 respondents made of 20 technical teachers from technical colleges and 30 industrial supervisors in Niger state. The entire population was used for the study because of its manageable size. A structured questionnaire was developed and used for data collection. The questionnaire was face validated by three lecturers in the department of Industrial and Technology Education, Federal University of Technology Minna. They were asked to check the appropriateness of the instrument, clarity of items and suitability of the purposes and hypotheses. Their inputs were used to develop the final version of the instrument. A reliability consistency was used to determine the internal consistency of the instrument. Three copies of the questionnaire were distributed and retrieved back. The duty filled questionnaires were collected immediately to ensured 100% return rate. The data collected were analyzed using SA, A, D and SD for answering the three research questions while t-test statistics was used to test all the null hypotheses at 0.05 level of significance.

5.2 Implications of the Study

The findings of the study had implications for government, industries technical colleges and students of technical colleges of Niger state. From the outcome of the study, it implies that:

1. If the identified areas where collaboration between technical colleges and industries is improve technical teachers and students would have become acquainted with industrial facilities for training thereby making learning effective both theoretical and practical.

2. If the technical college teachers are well trained and use to industrial equipment, tools and machineries, such knowledge will be transfer to the students. This will make the students more skillful to perform in the industries and labour market and to be self reliance/employ hence reducing rate of unemployment. On the other hand the nation will be well develop because of the increase in the labour force.

5.3 Conclusion

The study strategies for improving collaboration between technical colleges and industries for skill acquisition in electrical installation and maintenance work in Niger State. Three objectives were formulated, three research questions were raised to guide the study and three hypotheses were formulated at 0.05 level of significance. The study found that most of the respondents agreed on the administrative strategies that could improve technical colleges -industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State and also most of the respondents agreed on the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State. Based on the findings of the study, the following conclusions were drawn: students of technical colleges can only acquire skills for employment and to be self employed after graduation when there is collaboration between industries and technical colleges. Because these industries possessed the necessary technological skills, tools, equipment and machineries, that these students can be expose to during their course of training. Therefore the rate of unemployment could be reduced when these technical colleges students are expose to modern technologies in industries through the administrative strategies, school based activities and industry based activities to be able to serve the industries, the society and to be self employed after graduation.

5.4 Recommendations

1. Industry base job skill should be included in the curriculum of technical colleges for skill acquisition.
2. Technical teachers/instructors should visit industrial enterprises to familiarize themselves with the current technologies, sharing of facilities between technical colleges should be encouraged.
3. Curriculum and syllabus of technical colleges be discussed with many employers as possible on the formation of curriculum objective, selection of curriculum content, organization of the content, selection of learning experience and the organization.
4. Training equipment, machines, laboratories workshops, ICT library and classrooms should be provided to technical colleges by government and philanthropies in the society for effective training.

5.5 Suggestion for Further Studies

The following are suggested for further studies:

1. Mechanism for improving quality of management of Technical colleges for skill acquisitions.
2. Similar study should be conducted in other areas such as building technology, woodwork, mechanical technology, Agric mechanization etc.

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QUESTIONNAIRE ON STRATEGIES FOR IMPROVING COLLABORATION BETWEEN TECHNICAL COLLEGES AND INDUSTRIES FOR SKILLS ACQUISITION IN ELECTRICAL INSTALLATION AND MAINTENANCE WORK IN NIGER STATE

SECTION A: PERSONAL DATA

Please read the statement below and indicate with a check (√) the response that best suites your view. All information will be kept confidential and use only for the purpose of this research work.

What is your status?

1. Teacher/Administrator [ ]
2. Industrial supervisor/manager [ ]

INSTRUCTION FOR SECTION B, C AND D

Please indicate with a check (√) in the appropriate columns the extent to which you agree or disagree with the under listed statements.

RESPONSE SCALE			VALUE
POINTS Strongly Agree	-	SA	4
Agree	-	A	3
Disagree	-	D	2
Strongly Disagree	-	SD	1

SECTION B

RESEARCH QUESTION ONE

What are the administrative strategies that could improve technical colleges -industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State?

S/No	Item Description	SA	A	D	SD
1	NBTE, ITF and Industries should set up school industry advisory committee to monitor implementation of approved courses in technical colleges				
2	Government should set up coordinating units/boards to carry out survey of skills needed by industries and giving feed back to relevant departments				
3	Government should establish industrial liaison offices/coordinating units in technical colleges				
4	Government should establish laws that will encourage industries and technical colleges to develop training programmes that can meet their internal needs				
5	Industries should be encouraged to develop training programmes in technical colleges in relation to their internal needs				
6	Industrial based job skills should be included in the curriculum of technical colleges for skill acquisition				
7	Industries should be involved in screening and recommending courses or trades in technical colleges				
8	Government should encourage industries to establish vocational and apprentice training centres in their area of operations				
9	ITF, on regular basis should organize training programmes aimed at upgrading the knowledge of technical personnel				
10	ITF and NBTE should organize seminars, workshops and for training personnel				

SECTION C

RESEARCH QUESTION TWO

What are the technical college-based activities that could improve collaboration for skill acquisition in electrical installation and maintenance work in Niger State?

S/No	Item Description	SA 4	A 3	D 2	SD 1
1	Jointly organizing seminars, workshops by technical colleges and industries can improve school-industry collaboration				
2	Industries and Technical Colleges sharing of facilities can improve school-industry collaboration				
3	Provision of programme of studies based on high academic standard can improve school- industry collaboration				
4	Involvement of industries in evaluating students relevant learning experiences acquired in the technical colleges can improve school-industry collaboration				
5	Organizing cross training between industries and technical institutions personnel can improve school industry collaboration				
6	Counseling of students for career exploration in specific vocation relevant to industries can improve school industry collaboration				
7	Involving industries in setting and marking of practical examinations in technical colleges can improve school-industry collaboration				
8	Industrial training attachment for students in industries can improve school industry collaboration				
9	Engaging electrical engineering professionals in industry in part time teaching in technical colleges can improve school industry collaboration				
10	Inviting guest speakers from industry to deliver lectures in technical colleges can improve school industry collaboration				
11	Evaluation of the students to find out the extent to which they have acquired skills by school and industries can improve school-industry collaboration				

SECTION D

RESEARCH QUESTION THREE

What are the industry-based activities that could improve technical colleges-industry collaboration for skill acquisition in electrical installation and maintenance work in Niger State?

S/No	Item Description	SA	A	D	SD
1	Provision of internship training and on –the- job training by industries				
2	Assessment of training facilities of technical colleges to find out if they are capable of giving the students adequate background in those occupations required in the industry				
3	Examination of craft curriculum of the training programme of technical colleges to ensure that their occupational interest is covered				
4	Provision of funds for the execution of technical colleges programmes				
5	Involving technical teachers/instructors working on industrial machinery in the production process so as to upgrade their knowledge and skills to keep abreast with new technological advancement				
6	Provision of occupational placement for graduates of technical college programme by the industries				
7	Provision of instructional materials to technical colleges by the industries				
8	Donating information and communication technology equipment and tools to technical colleges				