

UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF TECHNOLOGY EDUCATION-KUMASI

A COMPARATIVELY ANALYSIS OF THE PRACTICAL SKILLS
ACQUISITION IN ELECTRICAL ENGINEERING TRAINING
PROGRAMME
(A CASE STUDY OF ACCRA AND KUMASI POLYTECHNICS)



JOHN ABBAN

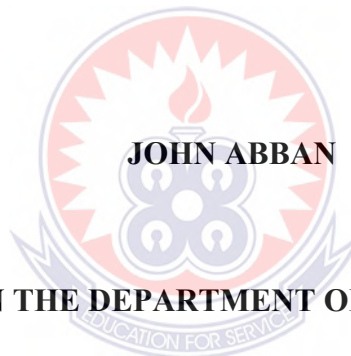
AUGUST, 2017

**UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF TECHNOLOGY EDUCATION-KUMASI**

DEPARTMENT OF AUTO AND ELECTRICALS

**A COMPARATIVELY ANALYSIS OF THE PRACTICAL SKILLS
ACQUISITION IN ELECTRICAL ENGINEERING TRAINING
PROGRAMME**

(A CASE STUDY OF ACCRA AND KUMASI POLYTECHNICS)



**A DISSERTATION IN THE DEPARTMENT OF AUTO AND ELECTRICALS
EDUCATION, FACULTY OF TECHNICAL EDUCATION, SUBMITTED TO
THE SCHOOL OF GRADUATE STUDIES, UNIVERSITY OF EDUCATION,
WINNEBA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF MASTERS OF TECHNOLOGY IN
ELECTRICAL/ELECTRONIC (EDUCATION)**

AUGUST, 2017



DECLARATION

STUDENT'S DECLARATION

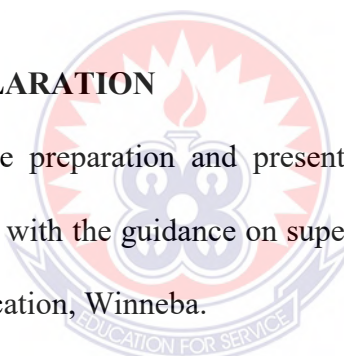
I, John Abban, hereby declare that project work is the result of my own original research and that no part of it has been presented for another degree in this University or anywhere.

SIGNATURE.....

DATE.....

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this Project work were supervised in accordance with the guidance on supervision of project work laid down by the University of Education, Winneba.



SUPERVISOR'S NAME: MR. C.K NWORU

SIGNATURE.....

DATE.....

DEDICATION

I dedicate this research work to my lovely wife Mrs. Martha Abban and children Dion, Judith, John and Irene there are combined effort has seen me through during the programme.



ACKNOWLEDGEMENT

First and foremost, I owe the Almighty God, who is always at the helm of affairs, a great debt of gratitude for his sustaining grace bountiful provisions which have seen me through this project.

My second appreciation goes to my mentor Mr. Godfred Hagan at University of Ghana Legon for his contributed support.

Special thank goes to my project supervisor Mr. C.K Nworu who in spite of his tight schedule provided the necessary advice and guidance.

Finally, I want to thank my Mother Comfort Baah for her prayer support.



ABSTRACT

This research was designed to determine the comparative study of practical skills acquisition in electrical engineering training programme in Accra and Kumasi Polytechnics. The study population was made of 316 and 262 making a total of 578 students in the Department of Electrical/Electronic Engineering from the Accra and Kumasi institutions respectively. A samples size of 25% was randomly selected from the total populations of the two study institutions. A total number of 145 questionnaires were distributed and 123 completed questionnaires were received making a response rate of 84.82%. Out of this, 73 were respondents from Kumasi while the remaining 50 were Accra respondents. The findings revealed that skills acquisition provides access to better working and payment conditions, practical training helps in equipping individuals with the essential skills to become useful in the society, and acquisition of skills prepare students to fit in readily employment in all sectors of the economy and revealed lack of training materials in both institutions and related firms. The study recommended that, the Government should increase budgetary allocations for provision of adequate training facilities and resources in the Polytechnics Education to make practicals effective.

TABLE OF CONTENT

Content	Page
Declaration.....	ii
Dedication.....	iii
Acknowledgement	iv
Abstract.....	v
Table Of Content.....	vi
List Of Tables	xi
List Of Figures	xii

CHAPTER ONE:INTRODUCTION

1.1 Background.....	1
1.2 Statement Of The Problem.....	2
1.3 Purpose Of The Study.....	3
1.4 Objective Of The Study	3
1.5 Research Questions.....	4
1.6 Significance Of The Study.....	4
1.7 Scope And Limitation Of The Study	5
1.8 Organisation Of The Study	5

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Introduction.....	6
2.2 Polytechnics Education In Ghana	7
2.3 Mandate Of Polytechnics In Ghana	7
2.4 Background Of Accra And Kumasi Polytechnics	9
2.5 Polytechnics Education And Practical Skills Acquisition	10
2.5.1 Competency Based Training For Capacity Building.....	11
2.6 Skill Acquisition	12
2.7 Polytechnics Education Versus Skills Acquisition.....	14
2.8 Significance Of Skills Acquisition To The National Development.....	14
2.8.1 It's Benefits To National Development	15
2.9 Facility Challenges For Skills Acquisition	16
2.10 Challenges Of Skill Acquisition At Polytechnics In Ghana	17
2.10.1 Poor And Inadequate Machines And Equipment.....	18
2.10.2 Staffing (Lack Of Qualified Lecturers).....	18
2.10.3 Poor Infrastructural Facilities	18
2.10.4 Curriculum	19
2.10.5 Calibre Of Students Admitted Into The Hnd Programmes.....	19
2.11 Conclusion	20

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction.....	21
3.1 Research Design.....	21
3.2 Population And Sample For The Study	21
3.3 Sample And Sampling Technique	22
3.4 Instrumentation	22
3.5 Data Collection	23
3.6 Analysis Procedure	23

CHAPTER FOUR: RESULTS AND DISCUSSION

4.0 Introduction.....	25
4.1 Survey Findings	25
4.2 Gender.....	26
4.3 Program Of Study	27
4.4 Levels Of Study Of The Respondents	28
4.5 The Extent To Which Electrical/Electronic Engineering Students Are Exposed To Practical Training.....	28
4.5.1 Kumasi Polytechnic Response On The Extent To Which Electrical/Electronic Engineering Students Are Exposed To Practical Training	29
4.5.2 Responses From Accra Polytechnic Students On The Extent To Which Electrical/Electronic Engineering Students Are Exposed To Practical Training	31

4.6. Comparative Analysis Of The Extent To Which Electrical/Electronic Engineering Students Are Exposed To Practical Training Between The Study Institutions	34
4.6.1 Discussion	35
4.7 Responses On Adequacy Of Facilities And Resources For Electrical/Electronic Engineering In Ghanaian Polytechnicsfrom Kumasi Polytechnic.....	37
4.8 Responses On Adequacy Of Facilities And Resources For Electrical/Electronic Engineering In Ghanaian Hnics From Accra Polytechnic.....	38
4.9 Comparative Analysis Of Responses On Facilities And Resources For Electrical/Electronic Engineering Department Between The Study Institutions.....	40
4.9.1 Discussion	42
4.10 Responsesfrom Kumasi On The Importance Of Skills Acquisition To A Nation	42
4.11 Responses From Accra On Importance Of Skills Acquisition To A Nation	45
4.12 Discussion	47

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction.....	48
5.1 Summary Of Findings.....	48
5.1.1 Summary On Importance Of Skills Acquisition To A Nation.....	49
5.1.3 Summary On Adequacy Of Facilities And Resources For Electrical Engineering Program In Ghanaian Polytechnics.....	50
5.2 Conclusion	51

5.3 Recommendations.....	51
REFERENCES	52
APPENDIX.....	57



LIST OF TABLES

Table	Page
4.1 Gender Ratio of the Respondents	26
1: Student population Data.....	22
4.2 Program of Study of the Respondents	27
4.3 Levels of Study of the Respondents.....	28
4.5.1 Responses from Kumasi Polytechnic Respondents on the extent to which Electrical/Electronic Engineering Students are exposed to practical training	31
4.5.2 Responses from Accra Polytechnic on the extent to which Electrical/Electronic Engineering Students are exposed to practical training	33
4.6 Comparative Analysis of the extent to which Electrical/Electronic Engineering Students are Exposed to Practical training between the study institutions.....	36
4.7 Responses on Facilities and resources for Electrical/Electronic Engineering Department from Kumasi Polytechnic.....	38
4.8 Responses on Facilities and resources for Electrical/Electronic Engineering Department from Accra Polytechnic	40
4.9 Comparative Analysis of Responses on Facilities and resources for Electrical/Electronic Engineering Department from the study institutions	41
4.10 Responses from Kumasi on the Importance of Skills Acquisition to a Nation ...	44
4.11 Responses from Accra on the Importance of Skills Acquisition to a Nation.....	43

LIST OF FIGURES

Figure	Page
4.1 Response Rate of the Total Respondents.....	26



CHAPTER ONE

INTRODUCTION

This chapter provides the background of the study, statement of the problem, purpose of the study, objective of the study, research questions, significance of the study and the scope and limitation of the study.

1.1 Background

Adequate and continuous supply of any nation's workforce for the sustenance of technological and industrial growth can be achieved through relevant education that involve skills acquisition. Skills acquisition as it is, can be defined as the form of training by individuals or group of individuals that can lead to acquisition of knowledge for self sustenance. It involves the training of people in different fields of trade under a legal agreement between the trainers and the trainees for certain duration and under certain conditions (Arowolo, 2010). Ochiagha (1995) defined skill acquisition as the process of demonstrating the habit of active thinking or behaviour in a specific activity. He further stated that skill acquisition is seen as the ability to do or perform an activity that is related to some meaningful exercise, work or job. He maintains that for skill to be acquired, appropriate knowledge, attitudes, habits of thought and qualities of character are learnt to enable the acquirer develop intellectual, emotional and moral character which prepares him or her for a brighter future.

Similarly, Donli (2004) is of the view that skill acquisition is the manifestation of idea and knowledge through training which is geared towards instilling in individuals, the spirit of entrepreneurship needed for meaningful development. He stressed that if

individuals are given the opportunity to acquire relevant skills needed for self sustenance in the economy, it will promote their charisma in any work environment. Hence, skill acquisition increases competition and cooperation among people. Okorie,(2001) was of the view that the worth of an individual to society grows out of contribution of his/her skills, knowledge and applied productive capacity to tasks that need to be completed rather than out of artificial status connotation attached to some glamorous jobs.

From the above literature, it is apparent that the Polytechnics core mandate in Ghana is immeasurably relevant to place its graduates at a competitive edge in a global market as it's career-focused development and sustainnance.

1.2 Statement of the Problem

The development of adequate skills and competencies is an important characteristic of Polytechnic Education in Ghana. It's role towards the economic emancipation of a nation cannot be underscored. Emperical researches have shown that ineffective and inefficient training of the students reflects in the quality of graduates produced (Dasmani, 2011). Indeed, Polytechnic Education in Ghana by mandate is aimed at producing graduates with technical know-how in various fields of engineering and manufacturing sectors, technology transfer and skills development. Thus to produce students with expertness, proficiency in task performing in a particular field and must be able to follow a well-rehearsed techniques of carrying out a task; all to enhance the socio-economic development of the country.

Nevertheless, Polytechnics graduate in Ghana have, over the years, turned out a great number of artisan and technicians who do not meet the demand of the job market. Such Polytechnic graduates are theoretically in orientated and hence found wanting

when they are called upon to perform in their various fields of study. As a result they are unable to establish on their own and neither do they find it easy to secure wage-employment. There are even instances where some products of Polytechnic Education work as messengers or security personnel in some companies.

This phenomenon constitutes a colossal loss to the nation, and the study against this background conducted to comparatively analyse of the practical skills acquisition in Electrical Engineering training programme using Kumasi and Accra Polytechnics in the Ashanti and Greater Accra regions respectively in Ghana as a case study.

1.3 Purpose of the Study

Skills acquisition and development have been a major focused in Polytechnic statutory in Ghana. Hence, Polytechnics in Ghana were established to provide career-focused education and skills acquisition to students. After graduating from Polytechnic, ability to perform well in a particular task as a result of exposure, training and practice is highly expected.

The main purpose of the study therefore is to comparatively analyse the practical skills acquisition in Electrical Engineering training in Kumasi Polytechnic in the Ashanti Region and Accra Polytechnic in the Greater Accra Region respectively. Kumasi and Accra Polytechnics were used in this study as a results of them been among the three premier Polytechnics established in Ghana in the year 1963.

1.4 Objective of the Study

The main objectives of the study are as follows:

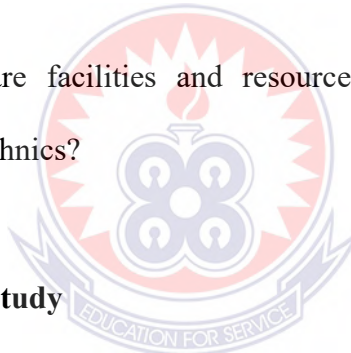
- i. To establish the importance of practical skills acquisition to a nation.

- ii. To assess the extent to which Electrical Engineering student in Ghanaian Polytechnics are exposed to practical skills acquisition.
- iii. To find out the availability of facilities and resources in the Ghanaian Polytechnics necessary for practical training in Electrical Engineering and

1.5 Research Questions

In order to have comprehensive response for the stated objectives, the following research questions were posed;

- i. Of what importance is skills acquisition to a nation?
- ii. To what extent are Electrical Engineering students exposed to practical training?
- iii. How adequate are facilities and resources for Electrical Engineering in Ghanaian Polytechnics?



1.6 Significance of the Study

The relevance of acquiring skill as a tool after graduation from Polytechnics can not be over emphasized. Hence, the significance of this study however, centres on the fact that it will contribute to the frontiers of knowledge on how skill acquisition can be effectively used as a tool for proper job placement. Again, exploring the potentials of the individual and the need to train Polytechnic students practically is very crucial in our present day competitive world of work. Therefore the outcome of this study is very important to both government, corporate bodies and non governmental agencies for decision making.

1.7 Scope and Limitation of the Study

The study focused on students pursuing Electrical Engineering programmes at the Polytechnic. The study was conducted at two different geographical locations namely Kumasi and Accra in Ashanti and Greater Accra regions of Ghana. These two institutions were chosen due to the fact that they are among the premier Polytechnics established in Ghana in 1963. The study does not cover the entire country of Ghana, hence it should be considered as an exploratory study. This is due to time and financial constraints on the part of the researcher. However, the study gives illumination of the need to resource our training institutions in this case Polytechnics to produce the needed and competent engineers for the country.

1.8 Organisation of the study

The study is organised into five main chapters. The First Chapter gives the background to the study and also highlights such issues as the statement of the problem, the purpose, significance, scope as well as limitations of the study. The research questions that guided the study also dealt with in this chapter.

The Second Chapter is devoted to the review of both theoretical and empirical literature relating to the subject while the Third Chapter discusses the methodology for conducting the study. Issues such as population, sampling procedures, research design, research instruments, administration of instruments, problems encountered in the process of collecting data and data analysis procedures were discussed.

Chapter Four focuses on the presentation, analysis and discussion of the data gathered from the field while Chapter Five, the final chapter, provides a summary of the study and also discusses the findings of the study, conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

It is generally believed that one of the major parameters for measuring a country's economic growth, development and self-reliance is the extent of the country's development in vocational and technical education (Bhuwanee 2006). Thus the neglect of vocational and technical education is socially injurious.

Okoro (1993) observes that one of the goals of technical and vocational education is to increase the employability of school leavers. This is because graduates of vocational and technical institutions are highly skilled entrepreneurs (Kehinde & Adewuyi, 2015). Obviously, the skills, abilities and competencies that are needed by the nation are embedded in vocational and technical education, which are central to a nation's social and economic liberalization (Dasmani 2011). Many of the so-called expatriate engineers who are being paid huge sums of money in foreign currencies to build the road and bridges and other related engineering works and services in Ghana are graduates of vocational and technical colleges in their home countries, yet, Ghana is not taking this sector seriously. Accordingly, any nation that believes in education as an instrument equally excellence for national development has to recognize the significance of technical and vocational education and accord it the desired attention and support that it deserves (Kehinde & Adewuyi, 2015). Consequently, it is in this wise that the Polytechnics Law (PNDCL 321 of 1992) in Ghana places serious emphasis on the development of technical and vocational education at the Polytechnics for overall development of the nation (Nyarko, 2011). The essence of Polytechnics education is to run career-centred and more practically oriented

programmes. This is to inculcate and develop highly knowledgeable and technically skilled middle-level human capital with productive and employable skills, attitudes and competencies required in industry and the world of work (GoG, 1992; Kwami, 2001; Amankwah, 2011). Significantly, for the purposes of realising the whole essence and objective of Polytechnics education in human resource development, it is imperative for students to acquire both theoretical and practical knowledge and technical skills. This can be accomplished through institutional support and collaboration as well as Polytechnics-industry linkage. Similarly, competency-based training and industrial attachment have been introduced and instituted in the Polytechnics as a significant step and conduit of enhancing students' technical knowledge, productive skills, competencies, attitudes and abilities essential for the world of work.

2.2 Polytechnics Education in Ghana

Polytechnics are higher educational institutions responsible for training in scientific and technical subjects. The Polytechnics in Ghana were first established as technical institutes that offered craft courses. In 1963, the three Technical Institutes in Accra, Kumasi and Takoradi were upgraded into Polytechnics following the industrial development policy and rapid technological progress in a broad range of areas. There was the need the Technical Institutions were offering second-cycle craft courses while the Universities were offering higher tertiary courses of which there was a gap in the manpower supply needs of the country (Nsiah 2005).

2.3 Mandate of Polytechnics in Ghana

The Polytechnics Law of 1992 (PNDC Law 321) which upgraded the Polytechnics into tertiary institutions assigned the appropriate aims and objectives as follows:

- i. To provide tertiary education through full time courses in the field of manufacturing, commerce, science, technology, applied social science, applied arts and such other areas as may be determined by the authority for the time being responsible for higher education.
- ii. To encourage study in technical subjects at tertiary level.
- iii. To provide opportunity for development, research and publication of research findings.

From the above, it can be inferred that the core mandate of Polytechnics education in Ghana is geared towards career-oriented programmes. It's more practical focus than those offered in the Universities whose central mission is to generate and disseminate knowledge through teaching, research and service. Polytechnics have a primary mandate in the development of highly skilled manpower resources needed in the industry and the world of work. As such, Kwami (2001) described Polytechnics in Ghana as: "Technological institutions contributing actively to national development by providing career-focused education and skills training to the highest level possible and providing opportunities for applied research in close collaboration with business and industry".

The Report further highlighted the mission of Polytechnics in Ghana as to:

- i. Maintain teaching and learning environment conducive to training highly skilled and competent manpower invested with entrepreneurial skills in partnership with other institution and industry;
- ii. Provide opportunities for and conduct applied research to advance economic growth; and
- iii. Provide expert service with the view to satisfying needs.

These objectives were further clarified by Polytechnics Law (Act 745, 2007). This law emphasized the role of Polytechnics in the provision of tertiary education that is career focused, to prepare students for middle level supervisory and managerial positions in business and industry in Ghana.

The literature above simply brand the reason or mission for establishing Polytechnics as to provide high caliber career-focused middle-level technical personnel, possessing knowledge-based modern skills for various sectors of the economy.

2.4 Background of Accra and Kumasi Polytechnics

Accra Polytechnics, the oldest of the Polytechnics in Ghana begun in 1949 as a Technical School and re-designated later as a Technical Institute in 1957 and then a Polytechnics by a Presidential order in 1963. Even though it was re-designated as a Polytechnics, it remained under the Ghana Education Service (GES) as a second-cycle institution until 1993 when it was upgraded to tertiary status after the promulgation of the Polytechnics Law. Kumasi Polytechnics began in 1954 as Technical Institute and later re-designated as Polytechnics in 1963 but still as a second-cycle institution under GES until it was elevated to tertiary status in 1993 (Agodzo, 2007).

Kumasi Polytechnics known earlier as Kumasi Technical Institute was established in 1954, but started actual teaching in 1955, dealing mainly with craft courses. It became a Polytechnic in 1963 and from then on, concentrated on Technician and few Diploma programmes. Additionally, a few professional courses were offered. Following the enactment of the Polytechnics Law 1992, PNDC Law 321, and Kumasi Polytechnics became a tertiary institution.

Currently, Kumasi and Accra Polytechnics are organized into Faculties, Schools, and Institutes; Faculty of Engineering, Faculty of Built and Natural Environment, Faculty

of Medicine and Health Sciences, Faculty of Applied Sciences, Faculty of Creative Arts and Technology, Faculty of Business and Management Studies, Institute of Entrepreneurship and Enterprise Development, Institute of Distance and Continuing Education, School of Graduate Studies, Research and Innovation.

However, the white paper which gave prominence to Polytechnics education following the promulgation of the Polytechnics Law, 1992 (PNDC Law 321) specifically stated that the Polytechnics have a distinct and important role to play in middle-level manpower development, and as such, programmes and courses were to be offered at the middle-level of technical training leading to the award of Higher National Diplomas (HND) but not departing from syllabi dedicated to practical training (Agodzo, 2007; Nsiah 2005).

The provision of such programmes will complete the cycle of technical education and provide a capacity for higher-level technician training and practical research (MOE, 1993). Therefore, establishment of Polytechnics institutions was expected to lead to increases in the middle-level technical manpower base of the country.

2.5 Polytechnics Education and Practical Skills Acquisition

Fundamentally, the essence of Polytechnics education as highlighted earlier, is to run career-centered and more practically oriented programmes. Most of the Polytechnics in Ghana, train students in at least three of the following faculties such as applied science, business and management studies, creative or applied arts, engineering, entrepreneurship and medicine and health science. This is to inculcate and develop highly knowledgeable and technically skilled middle-level human capital with

productive and employable skills, attitudes and competencies required in industry and the world of work (Go G, 1992; Kwami, 2001; Amankwah, 2011).

Significantly, in realising these objectives of Polytechnics education in human resource development, it is imperative for students to acquire both theoretical and practical knowledge and technical skills. This can be accomplished through institutional support and collaboration as well as Polytechnics-Industry linkage. Consequently, competency-based training and industrial attachment have been introduced and instituted in the Polytechnics as a significant step of enhancing students' technical knowledge, productive skills, competencies, attitudes and abilities essential for the world of work.

2.5.1 Competency Based Training for Capacity Building

Competency –Based Training (CBT) programmes are often comprised of modules broken into segments called learning outcomes, which are based on standards set by industry, and assessment is designed to ensure each student has achieved all the outcomes (skills and knowledge) required by each module (Smith & Nangle, 1995). Agodzo (2005) on his part defined competency-based learning simply as ‘do-it yourself’ (DIY) learning. According to him, a graduate who has gone through CBT should be well equipped for hands-on, practical work. Thus it focuses on the development of skills, knowledge and attitudes required to be competitively outstanding (Nsiah-Gyabaah, 2007).

Similarly, industrial attachment is a practical skill training designed to bridge the gap between the theoretical world of academic and the world of work of professional practice (Lauber, Ruth, Theuri & Woodlock, 2004). The addition of the industrial training in the Polytechnics's curriculum is purposely to attach trainees to course

related industries and the environment in which they operate, give them hands on practicals in their various fields, transfer knowledge acquired in the lecture hall to real world- of –work, familiarize themselves with new technological trends, and have the opportunity to bridge the gap that exists between theory and practice (Effah, 2011).

Again, industrial attachment is a process of anticipatory socialisation where participants engage with industry to observe, learn, experiment and put theory into practice in order to acquire technical knowledge, productive and innovative skills, competencies, attitudes and abilities necessary for the world of work. It serves as a perfect transition from the classroom to the world of work by developing students' job related skills, and enhancing job placement opportunities, as well as developing the problem solving, communication and human relations skills of students (Ayarkwa, Adinyira & Osei-Asibey 2012; Adjei, 2013). It integrates practical experience with theory, builds students' professional confidence level, and bridges the gap between classroom and world of work. Similarly, it serves as a source of recruiting and selecting new employees, injecting new ideas into an organisation, and developing industry support for Polytechnics programmes (Adjei, Nyarko, Nunfam, 2012; Adjei, 2013; Adjei, Nyarko & Nunfam, 2014).

2.6 Skill Acquisition

Skill is a specialized and well-rehearsed method or technique of carrying out a function/task which could be repeated with predictable quality, efficiency and effectiveness. It is expertise of accomplishment of task in any field, especially in a complex organized pattern of behaviour acquired through training and practice (Colman, 2003). Umar (2010) and Okorie and Ezeji (1998) posit skill as well

established habit of doing something involving the acquisition of performance capabilities in the most economic way.

Nnachi (2010) stated that skill is the ability to perform well in a task as a result of exposure, training and practice. Therefore skilled person is an individual that has undergone some extensive training in his job and there by mastered the activities that lead to successful performance in the concerned profession, trade or job.

According to Ochiagha, (1995) attributed the process of demonstrating the habit of active thinking or behaviour in a specific activity. He further stated that skill acquisition is seen as the ability to do or perform an activity that is related to some meaningful exercise, work or job. Donli (2004) views skill acquisition as the manifestation of idea and knowledge through training which is geared towards instilling in individuals, the spirit of entrepreneurship needed for meaningful development. Accordingly, Magbagbeola (2004) maintained that skills acquisition requires the accumulation of different skills that enhances task performance through the integration of both theoretical and practical forms of knowledge.

He enumerated the guidelines for the sustenance of skill acquisition programme to include the followings;

- i. Provision of training that gives the trainees the opportunities to acquire skills that are appropriate for preparation in a field of trade for gainful employment.
- ii. Provision of definite skills that relate to each trade that makes one a professional in one field instead of the others.
- iii. Skill acquisition requires much practice, patience, interest, ability, aptitude and personality traits.
- iv. Skill acquisition requires conducive environment.

- v. Training requires constructive human relationship, business skills, imitation and constructive ideas.

2.7 Polytechnics Education Versus Skills Acquisition

Polytechnics are established for the production of middle level technical manpower needed for industrial and technological development of the country. This act provides a framework that guides the establishment of Polytechnics education to diversify the economy and make the country scientifically and technologically independent. The importance of Polytechnics education is twofold;

- i. it aims to bridge the gap between theory and practical and of course
- ii. to provide employment for skilled technicians.

Polytechnics education is further structured to be technical, scientific, educational, practical and research oriented. Ojerinde (2015) insist that Polytechnics education is the answer to technological advancement. He believes that if the policy on technical skills is adopted, the Polytechnics education would help in providing manpower to the nations industries and firms.

The fact is that skill acquisition is the core element of Polytechnics education as it trains technicians in various skills. The importance of skills acquisition as an integral part of Polytechnics education cannot be over emphasized because its role in national development are multi dimensional. It ensures the attainment of perfection. Hence it is expected that skill acquisition through practical training will have significant impact on electrical technology and engineering education students on their performance.

2.8 Significance of Skills Acquisition to the National Development

The growing concern over globalization, among other things, has made the acquisition of lifelong skills imperative for all categories of people (Umar, 2010). This

is considered very important for future professional growth because it will determine how successful and productive a person will be in the work place.

Shaffer (1997) observes that human capital is created when they acquire transferable skills that can be applied in many settings and occupations. It is an important index of sustainable development of any nation. In view of this, Anderson (1999) considers it as both a social prerogative and an economic necessity. With skill acquisition, one acquires capabilities to compete favorably within the context of globalization. Datol and Padung (2000) assert that there is a positive correlation between skills acquisition and the total development of a country. By implication, unemployment rate keeps on increasing which will eventually be a threat to the society, thereby, slowing down the pace of development as a result of untapped potentials or talents that are lying idle.

2.8.1 It's Benefits To National Development

The acquisition of skills for a particular job will provide for people who could apply relevant knowledge to be able to make positive changes within the society. Ogundele and Gbenga (2010) express that skill acquisition can possibly advance the nation in the following ways:

- i. Building in the individuals the essential skill to become useful within the society. Since a well-trained worker will be much more productive as an individual within the society, such an individual will no longer be a burden to the nation.
- ii. Make an individual to cultivate better attitude to work. Having got the necessary productive skills of doing or carrying out things the way they

should, positive contributions can be made to the nation based upon the right attitude to work.

- iii. Jobs can be generated in abundance only if the acquired skills are derived and put in to use, giving rooms for the citizenry to think positively along the path of economic advancement. Skill acquisition will eradicate involuntarily and unproductively idleness for national development.
- iv. Any individual who acquires skill will be able to show case his / her talents, make intelligent use of the brain in terms of new discoveries and innovation that will even upgrade individual status within the society.
- v. Once citizens of such a nation acquired adequate skills to turn around their economy, there would not be the need to waste billons of naira in bringing in some experts from overseas (Ogundele &Gbenga, 2010) .

2.9 Facility Challenges for Skills Acquisition

Inadequate facilities for teaching/learning technical trades have been observed by a number of scholars. Osula, (2004) such facilities needed for skill training include infrastructural and physical elements in the workshops, laboratories, studios, which is made up all the tools, equipment, machines and other co related devices. Osinem(2008) orates thatthese facilities are required to be available in adequate and functional state in order to satisfy the needs of the curriculum. On the side of Puyate (2004), effective technical training would not be possible without adequate arrangements for the provision of required instructional facilities.

While these needs cannot be over emphasized for effective training to take place, Chado (2004) observed that many institutions offering technical and vocational

education programs are experiencing gross inadequacy of facilities for training and those that are available are either outdated, broken down or out of use. Others are noted for their gross inadequacy, unavailability and non functional state of the facilities (Okorie, and Ezeji, 1998; Bassey, 2000) respectively. Similarly, Emah (2005) observed that the expendable materials required to be used together with the equipment and machines for practices and for carrying out students project in technical and vocational programmes are lacking in schools thereby denying students and teachers the opportunity to use the facilities as and when due. However, the adverse effect is the production of half baked engineers, technicians, craftsmen, and vocational and technical education teachers (Oluteju, 2007).

2.10 Challenges of Skill Acquisition at Polytechnics in Ghana

Polytechnics as it is, trained graduates in line with its mandate and objectives are expected to be more practically oriented or biased as compared to their colleagues trained in the universities. Most of training packages at the Polytechnics are practical and industrial base. Industrial exposure as expressed by Stuliff (2000), gives the academics a chance to seek inputs and feedback from practicing professionals who can provide valuable insight into the skills and abilities students would need in their career. Ballinger and Lalwani (2000) also indicated that practical exposure offers an opportunity for students to personally practice the theoretical models in the classroom to enhance their chances of securing employment after graduation.

Of late Polytechnics Education is becoming more theoretical with less emphasis on skill acquisition. The practical training which is the core mandate is gradually dwindling due to the following reasons; poor and inadequate machines and

equipment, staffing (Lack of Qualified Lecturers), poor infrastructural facilities, curriculum, calibre of students admitted into the HND Programmes, and Industry/Polytechnics Linkages.

2.10.1 Poor and Inadequate Machines and Equipment

Lack of enough facilities, machines and equipment to give adequate training to their students have been a major problem to some Polytechnics. Machines and hand tools, field and laboratory equipment, and other instruments are inadequate (Odu, 2011). Some are also in an obsolete state and beyond repairs. This makes practical skills training very difficult.

2.10.2 Staffing (Lack of Qualified Lecturers)

The Polytechnics faced serious staffing problems when they were upgraded from second cycle institutions to being tertiary institutions. Inadequate qualified and professional staffing presented problems for teaching, learning and research (Nyarko, 2011). Teaching staff are required to possess a minimum of a research second degree and if possible Ph.D in their field of discipline as well as some industrial experiences. However, some lecturers fall short of these requirements (Amedorme, 2014). Non-teaching staff who should complement the effort of the lecturer by taking the students through the practical sessions are not enough and some do not have the required experience.

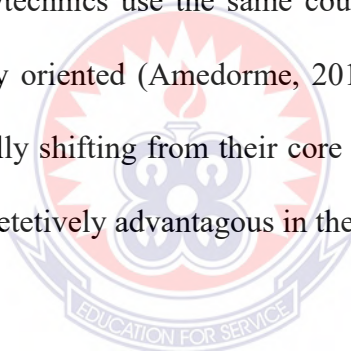
2.10.3 Poor Infrastructural Facilities

Most of the Polytechnics do not have adequate resources available for practical teaching and learning. Such facilities include laboratories, workshops, field facilities

and other needed equipment necessary for practical training (Amedorme, 2014). Others have dilapidated laboratories and workshops with no appropriate tools, instrument and gadget for skills acquisition (Okorie, 1998).

2.10.4 Curriculum

The development of curriculum according to Nyarko (2011) for all the HND programmes appears to be lagging behind and requires immediate attention to make them relevant and industry-friendly. This is to conform to the current thinking and the vision of the founding fathers that Polytechnics education should be career-oriented with more emphasis on the practical content of the various courses. Most of the Polytechnics use the same course content from the universities which are non practically oriented (Amedorme, 2014). This implies that most of the Polytechnics are gradually shifting from their core mandate of producing competent skill products to be competitively advantageous in the world of work.



2.10.5 Calibre of Students Admitted into the HND Programmes

The calibre of students admitted into the Polytechnics to pursue Engineering programmes also contribute to this lack of practical training among the Polytechnics graduates. Most of them are not interested in the practical training due to their background. Majority of them are from pure secondary or secondary technical with very few from the technical institutes. Pure technical institute students have a better foundation in practical than those from the secondary-technical school (Amedorme, 2014).

2.11 Conclusion

The following conclusions can be drawn from the literatures. It is observed from the study that many people recognize the importance of skills acquisition to the development of the country the implications are that:

- i. Acquisition of skills prepares students to fit into in all sectors of the economy after graduation.
- ii. Practical training helps in equipping individuals with the essential skills to become useful in the society also provide opportunities for conduct applied research to advance economic growth and offers people self-employment.



CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter gives a detailed description of the methods and techniques used in the study, for the collection, analysis and presentation of data.

3.1 Research Design

The researcher used quantitative survey methodology. This is because quantitative approaches are more specific and result oriented. It involves the collection of numerical data in order to explain, predict, and/or control phenomena of interest (Mojaheed, 2005). It also involves collecting data in order to test hypothesis or answer research questions concerning the status of the subject under study (Gay, 1992). Quantitative survey again seeks to find answers to questions through the analysis of relationship between or among variables (Amedahe, 2002). Therefore, this design enabled the researcher to gather the necessary data for the study.

3.2 Population and Sample for the Study

The population for the study was 578 students coming from the two institutions namely Accra and Kumasi Polytechnics. Out of this population, 404 are Higher National Diploma (HND) students, 65 Electrical Engineering Technicians (EET) Part III students, and 63 EET Part II students through non tertiary programme. However, EET Part I students were supposed to be an inclusive as it also requires practical training, yet the patronage at the polytechnics level is so low. This is because most of the private technical institutions have been running such programmes and students

pursue them at that level. The table below provides the breakdown of the study population data.

Table 1: Student population Data

Programme	Institution/Population		Total
	Kumasi Polytechnic	Accra Polytechnic	
Higher National Diploma	247	203	450
Electrical Engineering Technicain III	42	23	65
Electrical Engineering Technicain II	27	36	63
Total	316	262	578

Source: Field survey

3.3 Sample and Sampling Technique

Kumasi and Accra Polytechnics were selected as the study areas. Simple random sampling techniques were utilized in the study. This technique allow every member of the target population equal chance to be selected (Gay, 1992). It has advantage of reducing bias associated with non-random selection. A samples size of 145 students were randomly selected out of the 578 representing 25%. This sample size was selected to enable the study to involve reasonable number of respondents for the study. Therefore, a total number of 145 questionnaires were distributed and 95 completed questionnaires were received making a response rate of 65.5%.

3.4 Instrumentation

The researcher used structured questionnaire as an instrument for data collection. This questionnaire consisted of two parts; the first part consisted of demographic

characteristics of students demanded the respondents programme of study, institution and the level of the respondents. The second part consisted of three sub-sections with the following headings stated in a question form; importance of skill acquisition, extent to which electrical engineering students are exposed to practical training and adequacy and availability of facilities and resources for practical training. A 4-point Likert-scale type of question techniques was used in getting response from the participants.

3.5 Data Collection

A questionnaire was the main instrument used for the collection of data for the study. The questionnaires were closed type. It was administered to 145 electrical engineering students in the selected institutions and were given an ample time for response. The purpose of the study was explained to the respondents before given to them. The respondents were asked to tick (✓) as appropriate as it prevailed in their respective institutions. A total number of 95 questionnaires were received making a response rate of 65.5%.

3.6 Analysis Procedure

The data gathered were organized using descriptive statistical analysis. The arithmetic mean was used at a decision point of 2.50. The implication was that a mean value 2.50 and above was considered as 'agree' and values below 2.5 as 'disagree'. The statistical software called Statistical Package for Social Science version 16.0 (SPSS version 16.0) was used to analyze the data. The SPSS version 16.0 was used in other to have accurate and realistic results obtained from the respondents. Data were also

summarized using graphic presentations for the interpretation of findings. Statistics were based on percentages, frequencies and mean scores.



CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

The main purpose of the study is to comparatively analyse the practical skills acquisition in Electrical Engineering training in Kumasi and Accra Polytechnics in the Ashanti and Greater Accra Regions respectively. Kumasi and Accra Polytechnics were chosen for this study because they are among the three premier government Polytechnics established in Ghana in the year 1963.

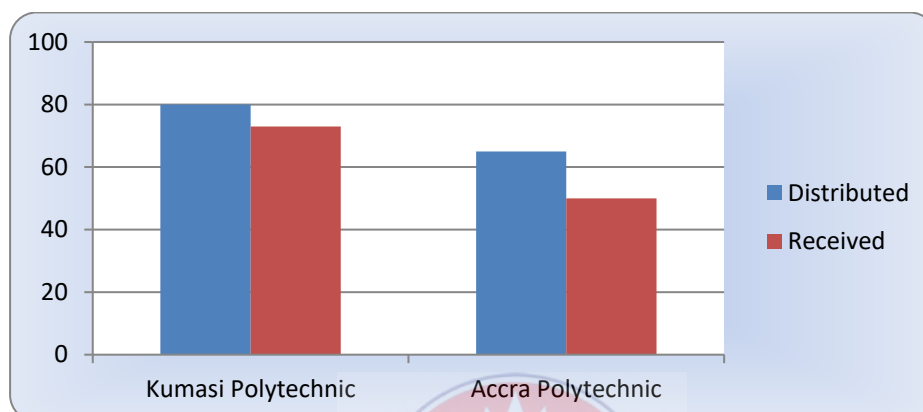
In order to achieve this, relevant review of literature on practical skills acquisition from public articles, journals and internet search was conducted. The review of literature captured the concept of Technical and Vocational Education, Polytechnic Education and Skill Acquisition in Ghana, Mandate and Objectives of Polytechnic Education in Ghana, Skill Acquisition and National Development, state of facilities for skills acquisition at Polytechnics in Ghana and the Challenges of Skill Acquisition at Polytechnics in Ghana. These relevant aspects of literature were developed into a questionnaire for the main survey. This chapter therefore presents the findings of the study.

4.1 Survey Findings

The study population was made of 316 and 262 making a total of 578 students in the Department of Electrical/Electronics Engineering from the two study institutions namely Kumasi and Accra Polytechnics respectively. A sample size of 25% was randomly selected from each of the total populations of the two study institutions; thus 80 from Kumasi Polytechnic and 65 from Accra Polytechnic. This sample size was selected to enable the study involve reasonable number of respondents to authenticate the outcome. According to Sanders (2005), 25% or more samples is necessary to

authenticate the results, hence making the findings more sensitive. Therefore, a total number of 145 questionnaires were distributed and 123 completed questionnaires were received making a response rate of 84.82%. Out of this, 73 were respondents from Kumasi while the remaining 50 were Accra respondents as shown in Figure 4.1.

Figure 4.1 Response Rate of the Total Respondents



Source: Field survey, December, 2016

4.2 Gender

It revealed from Figure 4.1 that most (84.93%) respondents in the Department of Electrical/Electronic Engineering in Kumasi were males while few (15.07) were females. In Accra, the trend remains the same as majority (41) representing 82% were male students while only nine representing 18% were females. It is important to note that Engineering programs are being dominated by males as it involves more practical activities.

Table 4.1 Gender Ratio of the Respondents

Sex	Male		Female	
	N	%	N	%
Kumasi	62	84.93	11	15.06
Accra	41	82.00	9	18.00
Total	103		20	

Source: Field survey, January, 2017

4.3 Program of Study

The researcher inquired into the respondents specific program of study being pursued in the department of Electricals/Electronic Engineering. It was observed from Table 4.1 that out of the 73 respondents in Kumasi, 44 representing 60.27% were pursuing Higher National Diploma (HND), 17 representing 23.29% were studying Electrical Engineering Technician (EET) III program while 12 thus 16.43% were (EET) II students. Similarly, the situation was different from Accra Polytechnic. Students pursuing HND were 32 out of 50 representing 64%, 11 (22%) students were pursuing EET III while seven representing 14% were EET II students.

From the above responses, it became apparent that most students prefer HND to EET programs. This implies that majority of the learners prefer program with less practicals as EET is more practically oriented than HND. This has however proven Amedorme, (2014) who asserted that most admitted are not interested in the practical training due to their background. He further iterated that majority of them are from pure Senior High and Senior high Technical Schools with very few from the technical institutes. Pure technical institute students have a better foundation in practicals than those from the Senior High Technical School. Interestingly, all students pursuing EET programs were pure technical students from technical institutes.

Table 4.2 Program of Study of the Respondents

Institution	Program of Study			Total
	HND	EET III	EET II	
Kumasi	44 (60.27%)	17 (23.29%)	12 (16.43%)	73
Accra	32 (64%)	11 (22%)	7 (14%)	50
Total	76	28	19	123

Source: Field survey, January, 2017

4.4 Levels of Study of the Respondents

From Table 4.2, it is clear that 27 out of 73 respondents were Third Year students, 24 representing 32.88% were Second Year students while 22 representing 30.13% were First Year students. In a similar trend, respondents in Accra were also evenly distributed as 17 (34%) were in Third Year. Again, 18 representing 36% were in their Second Year while 15 (30%) were in First Year.

The researcher got a fair representation of students from almost all the levels of study in the respective institutions though the method employed was simple random sampling.

Table 4.3 Levels of Study of the Respondents

Institution	Level of Study			Total
	3	2	1	
Kumasi	27 (36.99%)	24 (32.88%)	22 (30.13%)	73
Accra	17 (34%)	18 (36%)	15 (30%)	50
Total	44	42	37	123

Source: Field survey, January, 2017

4.5 The extent to which Electrical/Electronic Engineering Students are exposed to practical training

For the purpose of explaining the results obtained from Tables 4.5 to 4.10, the following range is used using weighted mean; thus 1-1.5 = strongly disagree, 1.6-2.5 = disagree, 2.6-3.5 = agree and above 3.5 strongly agree.

Thus Weighted Mean; $\bar{X} = \frac{w_1x_1+w_2x_2+w_3x_3...w_nx_n}{w_1+w_2+w_3...w_n}$, where \mathbf{W} is the number of

occurrences of x (weightings), x is the repeating value and \bar{X} is the Weighted Mean

4.5.1 Kumasi Polytechnic Response on the extent to which Electrical/Electronic Engineering Students are exposed to practical training

In soliciting views from the participants at the department of Electrical/Electronic Engineering from Kumasi Polytechnic, Table 4.5.1 revealed that significant respondents ($\bar{X} = 3.42$) agree that ‘budget for industrial training is highly inadequate’ as an item rated the highest and has been attributed as a major reason for the less exposure to practical training. and subsequently ranked first among other variables. It was also observed that ‘expendable materials required to be used together with the equipment and machines for practicals are lacking’ as an item had a weighted mean score $\bar{X} = 3.33$ which eventually ranked second. Again, the respondents unanimously agree with a significant score ($\bar{X} = 3.21$) that “Lack of training materials in both institutions and related firm” on the other hand contribute a lot as far as less practical is concerned and eventually ranked third among other variables. In furtherance, respondents once again agree that “The duration for industrial attachment programme is highly inadequate”. This item recorded $\bar{X} = 3.13$ and therefore ranked fourth. Subsequently, ‘inadequate firms relevant to student’s programme of study’ as item observed a reasonable score ($\bar{X} = 2.83$) which ranked fifth. Respondents again agree to these statements: “Difficulty in securing firms for attachment close to the place of abode” and “Practical lessons are held every two weeks when school is in session” as another significant reason for less exposure of students to practical training ($\bar{X} = 2.65$, & 2.61) and were ranked sixth and seventh.

However, respondents declined to the statements: “Students are not given access to machinery and equipment for hands-on-experience” and “ industry based supervisors meet attachees periodically to answer questions, guide performance and provide resources to facilitate the exercise”as reasons for less exposure to practical training with weighted mean scores $\bar{X} = 2.10, \&1.81$

It is important to note that majority of the respondents at the Kumasi Polytechnic in the Department of Electrical/Electronic Engineering agree that the extent to which they are exposed to practical training is obviously minimal.



Table 4.5.1 Responses from Kumasi Polytechnic Respondents on the extent to which Electrical/Electronic Engineering Students are exposed to practical training

S/N	Statement	Responses			
		N	(\bar{X})	Rank	Remarks
1	Budget for industrial training is highly inadequate	73	3.42	1	Agree
2	Inadequate firms relevant to student's programme of study	73	2.83	5	Agree
3	Lack of training materials in both institutions and related firm.	73	3.21	3	Agree
4	Expendable materials required to be used together with the equipment and machines for practicals are lacking	73	3.33	2	Agree
5	Difficulty in securing firms for attachment close to the place of abode	73	2.65	6	Agree
6	The duration for industrial attachment programme is highly inadequate.	73	3.13	4	Agree
7	Practical lessons are held every two weeks when school is in session	73	2.61	7	Agree
8	Industry based supervisors meet attaches periodically to answer questions, guide performance and provide resources to facilitate the exercise	73	1.81	9	Disagree
9	Students are given access to machinery and equipment for hands-on-experience	73	2.10	8	Disagree

Source: Field survey, January, 2017

4.5.2 Responses from Accra Polytechnic Students on the extent to which Electrical/Electronic Engineering Students are exposed to practical training

From Table 4.5.2, it's obvious that the respondents in Accra Polytechnic agree to most of the items as the reasons for their less exposure to practical training. In all,

respondents agree to seven items out of nine which are as follows in order of merit: "Lack of training materials in both institutions and related firm, expendable materials required to be used together with the equipment and machines for practicals are lacking, Inadequate firm relevant to student's programme of study, Students are not given access to machinery and equipment for hands-on-experience, Practical lessons are held every two weeks when school is in session, The duration for industrial attachment programme is highly inadequate and Difficulty in securing firms for attachment close to the place of abode" with the weighted mean scores $\bar{X} = 3.41, 3.33, 3.12, 3.01, 2.89, 2.87$ & 2.65 and subsequently ranked first to seventh. Inversely, respondents disagree to the statements "Budget for industrial training is highly inadequate and Industry based supervisors meet a ttachees periodically to answer questions, quide performance and provide resources to facilitate the exercise" as reasons for less exposure to practical training with weighted mean score $\bar{X} = 2.43, \& 2.12$ and were therefore ranked eighth and nineth respectively.

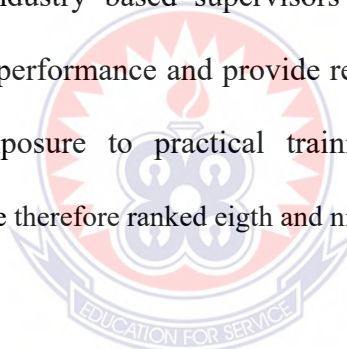


Table 4.5.2 Responses from Accra Polytechnic on the extent to which Electrical/Electronic Engineering Students are exposed to practical training

		Responses			
S/N	Statement	N	(\bar{X})	Rank	Remarks
1	Budget for industrial training is highly inadequate	50	2.43	8	Disagree
2	Inadequate firms relevant to student's programme of study	50	3.12	3	Agree
3	Lack of training materials in both institutions and related firm	50	3.41	1	Agree
4	Expendable materials required to be used together with the equipment and machines for practicals are lacking	50	3.33	2	Agree
5	Difficulty in securing firms for attachment close to the place of abode	50	2.65	7	Agree
6	The duration for industrial attachment programme is highly inadequate	50	2.87	6	Agree
7	Practical lessons are held every two weeks when school is in session	50	2.89	5	Agree
8	Industry based supervisors meet attaches periodically to answer questions, guide performance and provide resources to facilitate the exercise	50	2.12	9	Disagree
9	Students are not given access to machinery and equipment for hands-on-experience	50	3.01	4	Agree

Source: Field survey, January, 2017

4.6. Comparative Analysis of the extent to which Electrical/Electronic Engineering Students are exposed to practical training between the study institutions

Comparative analysis was done to ascertain the obvious elements or variables that were unanimously agreed upon by the study institutions. Apparently, responses on the item “Budget for industrial training is highly inadequate” were opposite. While Kumasi ranked it first, Accra, on the other hand ranked it last with a different score ($\bar{X} = 0.99$). Similarly, mixed reactions were observed against the statement “Inadequate firms relevant to student’s programme of study”. Though both institutions agreed, yet Accra ranked it first while Kumasi ranked it fifth with a different score ($\bar{X} = 0.29$). Close response was observed from the statement “Lack of training materials in both institutions and related firm” indicated a significant concordance ranked third in Kumasi and first in Accra with a score difference ($\bar{X} = 0.2$).

Interestingly, it was observed from Table 4.6 that both institutions equally agree with a significant score $\bar{X} = 3.33$ which respectively ranked second to the statement “Expendable materials required to be used together with the equipment and machines for practicals are lacking” that it represents one of the reasons for the less exposure to practical training. Ostensibly, the same weighted mean score ($\bar{X} = 2.65$) was observed on the item “Difficulty in securing firms for attachment close to the place of abode” yet differently ranked as sixth and seventh in respect of Kumasi and Accra. Similar contrasting scores were observed on the item “The duration for industrial attachment programme is highly inadequate”. While the response in Kumasi ranked it as fourth ($\bar{X} = 3.13$) item, responses in Accra placed it in the sixth ($\bar{X} = 2.87$) position. Moreover, the statement soliciting for the number of times practical lessons are held when

school is in session from the respondents, it was observed that responses in Kumasi slightly agree with score $\bar{X} = 2.61$ while responses in Accra recorded $\bar{X} = 2.89$ placing them in the seventh and fifth position respectively.

The two institutions unanimously disagree on the item: “Industry-based supervisors meet attachees periodically to answer questions, guide performance and provide resources to facilitate the exercise” with scores $\bar{X} = 1.18$ & 2.12 and eventually ranked ninth. Students are not given access to machinery and equipment for hands-on-experience as an item got another mixed reactions from the respondents from both institutions. While Kumasi positioned it on the eight, Accra, on the other hand, placed it fourth with scores $\bar{X} = 2.10$ & 3.10 .

It is important to note that both responses from the study institutions despite how each positioned the item, agree that students are not given enough access to machinery and equipment for hands-on-experience.

4.6.1 Discussion

The above analysis has obviously revealed that the extent to which students in the institutions under study are exposed to practical training is minimal due to certain challenges which include expendable materials, not given students access to machinery and equipment for hands-on-experience. These materials are required to be used together with the equipment and machines for practicals.

As these are lacking, effective practicals and skills acquisition would be denied. The adverse effect is the production of half baked engineers, technicians, craftsmen, and vocational and technical education teachers (Oluteju, 2007).

Again, as asserted by Stuliff (2000), industrial exposure gives the academics a chance to seek inputs and feedback from practicing professionals who can provide valuable

insight into the skills and abilities students would need in their career, this study has however reaffirmed this earlier submission. Ballinger and Lalwani (2000) also indicated that practical training offers an opportunity for students to personally practice the theoretical models in the classroom to enhance their chances of securing employment after graduation. The onus therefore lies on the authorities to ensure that the needed attention is directly given to practical training in order to fulfil the core mandate of Polytechnic in Ghana.

Table 4.6 Comparative Analysis of the extent to which Electrical/Electronic Engineering Students are Exposed to Practical training between the study institutions

S/N	Statement	Kumasi		Accra	
		(\bar{X})	Rank	(\bar{X})	Rank
1	Budget for industrial training is highly inadequate	3.42	1	2.43	8
2	Inadequate firms relevant to student's programme of study	2.83	5	3.12	3
3	Lack of training materials in both institutions and related firm.	3.21	3	3.41	1
4	Expendable materials required to be used together with the equipment and machines for practicals are lacking	3.33	2	3.33	2
5	Difficulty in securing firms for attachment close to the place of abode	2.65	6	2.65	7
6	The duration for industrial attachment programme is highly inadequate.	3.13	4	2.87	6
7	Practical lessons are held every two weeks when school is in session	2.61	7	2.89	5
8	Industry based supervisors meet attaches periodically to answer questions, guide performance and provide resources to facilitate the exercise	1.81	9	2.12	9
9	Students are not given access to machinery and equipment for hands-on-experience	2.10	8	3.01	4

Source: Field survey, January, 2017

4.7 Responses on Adequacy of Facilities and Resources for Electrical/Electronic Engineering in Ghanaian Polytechnics from Kumasi Polytechnic

In an attempt to solicit responses from the respondents on facilities and resources supporting practical training in the Department of Electrical/Electronic Engineering at the Kumasi Polytechnic, majority of the respondents strongly agree ($\bar{X} = 4.08$) that inadequate facilities and resources make practicals ineffective. As can be clearly observed from the Table 4.7, respondents again strongly agree ($\bar{X} = 3.99$) that, technical instructors for practical training are inadequate. Respondents further strongly agree that obsolete and out-dated equipment make practical lessons ineffective with weighted mean score $\bar{X} = 3.89$ hence ranked third among other items. Closely related item “industry executives are sometimes invited to deliver lessons/lectures” significantly had a weighted mean score $\bar{X} = 3.10$ and subsequently remarked agree and therefore ranked fourth. Inversely, respondents further disagree to the following statements which were subsequently ranked fifth, sixth and seventh respectively.

- i. Industry is involved in the drafting and review of curriculum for polytechnics,
- ii. Industry provides funds specifically for research to enhance practical training and
- iii. The department carries out joint research with industry to acquire knowledge/experience necessary for practical training.

Table 4.7 Responses on Facilities and resources for Electrical/Electronic Engineering Department from Kumasi Polytecnic

S/N	Item	Response			
		N	Weighted Mean(\bar{X})	Rank	Remarks
1	Inadequate facilities and resources make practicals ineffective	73	4.08	1	Strongly Agree
2	Obsolate and out-dated equipment make practical lesson ineffective	73	3.89	3	Strongly Agree
3	Industry provides funds specifically for research to enhance practical traning	73	2.01	6	Disagree
4	Industry executives are sometimes invited to deliver lessons/lectures	73	3.10	4	Agree
5	Industry is involved in the drafting and review of curriculum for polytechnics	73	2.11	5	Disagree
6	The department carries out joint research with industry to acquire knowledge/ experience necessary for practical training	73	1.89	7	Disagree
7	Technical instructors for practical training are inadequate	73	3.99	2	Strongly Agree

Source: Field survey, January, 2017

4.8 Responses on Adequacy of Facilities and Resources for Electrical/Electronic Engineering in Ghanaian hnicns from Accra Polytechnic

The responses on the adequacy of facilities and other resources for practical and skills training at the department from Accra Polytechnic are shown in Table 4.7. The respondents strongly agree that “technical instructors for practical training are inadequate” with weighted mean score $\bar{X} = 3.91$ which eventually ranked first. The respondents further strongly agree that “Inadequate facilities and resources make practicals ineffective”.

This item subsequently ranked second with score $\bar{X} = 3.88$. Again, the respondents clearly registered their strong agreement that ‘Obsolate and out-dated equipment make practical lesson ineffective’ and was ranked third. The researcher was keenly interested in ascertaining from the respondents as to whether industry executives are sometimes invited to deliver lessons/lectures to them.

Obviously, respondents significantly agree with a score $\bar{X} = 3.25$ and therefore ranked fourth. On the contrary, the respondents declined to register their agreement to the following items with scores ($\bar{X} = 2.42, 2.23$ & 1.89) and were respectively ranked fifth, sixth and seventh.

- i. Industry provides funds specifically for research to enhance practical training,
- ii. Industry is involved in the drafting and review of curriculum for polytechnics and
- iii. The department carries out joint research with industry to acquire knowledge/experience necessary for practical training.

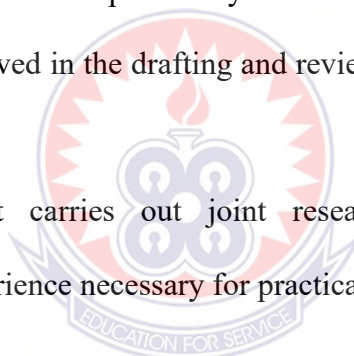


Table 4.8 Responses on Facilities and resources for Electrical/Electronic Engineering Department from Accra Polytecnic

S/N	Item	Response			
		N	Weighted Mean(\bar{X})	Rank	Remarks
1	Inadequate facilities and resources make practicals ineffective	50	3.88	2	Strongly Agree
2	Obsolate and out-dated equipment make practical lesson ineffective	50	3.77	3	Strongly Agree
3	Industry provides funds specifically for research to emhance practical traning	50	2.42	5	Disagree
4	Industry executives are sometimes invited to deliver lessons/lectures	50	3.25	4	Agree
5	Industry is involved in the drafting and review of curriculum for polytechnics	50	2.23	6	Disagree
6	The department carries out joint research with industry to acquire knowledge/experience necessary for practical training	50	1.89	7	Disagree
7	Technical instructors for practical training are inadequate	50	3.91	1	Strongly Agree

Source: Field survey, January, 2017

4.9 Comparative Analysis of Responses on Facilities and Resources for Electrical/Electronic Engineering Department between the study institutions

Comparative analysis was done to assess the responses from the two study institutions regarding the facilities and other resources intended to enhance practical training. It was observed from Table 4.9 that both institutions strongly agree to the statement 'Inadequate facilities and resources make practicals ineffective'. While respondents in Kumasi ranked it first ($\bar{X} = 4.08$), Accra on the other hand placed it second with a mean score $\bar{X} = 3.88$. Again, both institutions strongly agree that 'obsolate and out-dated equipment make practical lesson ineffective'.

With this item, both institutions coincidentally ranked it third. Apparently, the statement ‘technical instructors for practical training are inadequate’ significantly observed remarkable scores $\bar{X} = 3.99$ & 3.91 respectively in Kumasi and Accra which eventually ranked second in Kumasi and first in Accra. A reverse trend was observed as both institutions declined to the following statements:

- i. Industry is involved in the drafting and review of curriculum for polytechnics,
- ii. Industry provides funds specifically for research to enhance practical training and
- iii. The department carries out joint research with industry to acquire knowledge/experience necessary for practical training.

Table 4.9 Comparative Analysis of Responses on Facilities and resources for Electrical/Electronic Engineering Department from the study institutions

S/N	Statement	Kumasi		Accra	
		(\bar{X})	Rank	(\bar{X})	Rank
1	Inadequate facilities and resources make practicals	4.08	1	3.88	2
2	Obsolete and out-dated equipment make practical lesson ineffective	3.89	3	3.77	3
3	Industry provides funds specifically for research to enhance practical training	2.01	6	2.42	5
4	Industry executives are sometimes invited to deliver lessons/lectures	3.10	4	2.23	6
5	Industry is involved in the drafting and review of curriculum for polytechnics	2.11	5	3.25	4
6	The department carries out joint research with industry to acquire knowledge/experience necessary for practical training	1.89	7	1.89	7
7	Technical instructors for practical training are inadequate	3.99	2	3.91	1

Source: Field survey, January, 2017

4.9.1 Discussion

Clearly, the study has revealed significant resource and facility challenges in the study institutions. It is important to note however that, industries hardly support skills training institutions to train competent and competitive skilled personnel to close the technical know-how gaps in the industries. Again, departments have also been reluctant in collaborating with the industries in carrying out research projects in order to gain a new experience thereby passing it onto the trainees. Puyate (2004) pointed out that effective vocational and technical training would not be possible without adequate arrangements for the provision of required instructional facilities.

Many institutions offering Technical and Vocational Education programs are experiencing gross inadequacy of facilities for teaching/learning (Chado, 2004). Outdated nature of the installed machines and the lack of proper maintenance culture to promote life expectancy of the workshop facilities (Puyate, 2004; Bello, 2004). Most of the Polytechnics do not have adequate resources available for practical teaching and learning (Amedome, 2012).

4.10 Responses from Kumasi on the Importance of Skills Acquisition to a Nation

The researcher keenly solicited data from the respondents on how important it is to acquire skills. The results obtained in Table 4.10 revealed that majority of the respondents strongly agree to most items tested. The statement 'Practical training helps in equipping individuals with the essential skills to become useful in the society' emerged first with weighted mean score $\bar{X} = 4.12$. Similarly, the statement 'Skills acquisition provides access to better working and payment conditions' observed close mean score $\bar{X} = 4.08$.

Interestingly, two items observed score ($\bar{X} = 4.01$) and eventually ranked third. ‘Skills acquisition goes with high earning and productive work, as a statement recorded a significant score ($\bar{X} = 3.99$) and subsequently ranked fifth. Again, the statement ‘Industries regard workers with practical competencies as important sources of competitiveness advantage and assets and agent for change’ also relatively recorded similar score ($\bar{X} = 3.87$) and was ranked sixth. The items

- i. ‘Requisite skills provide stability and security at work,
- ii. Jobs can be created only with skills acquisition,
- iii. Skills development and lifelong learning are key for employment, and
- iv. Skills acquisition provides higher employability and better quality of life’

ranked seventh, eight, ninth and tenth with scores $\bar{X} = 3.61, 3.33, 3.12$ & 2.65 consecutively.

It is important to note that none of the responses remarked disagree, which implies that the importance of skills acquisition cannot be over-emphasised.

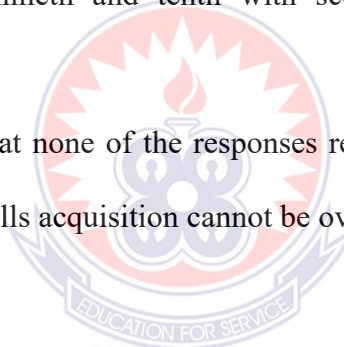


Table 4.10 Responses from Kumasi on the Importance of Skills Acquisition to a Nation

S/N	Item	Responses		
		Weighted Mean(\bar{X})	Rank	Remarks
1	Practical training helps in equipping individuals with the essential skills to become useful in the society	4.12	1	Strongly agree
2	Skills acquisition eradicate involuntarily idleness for national development	4.01	3	Strongly agree
3	Skills acquisition provides access to better working and payment conditions	4.08	2	Strongly agree
4	Jobs can be created only with skills acquisition	3.33	8	Agree
5	Skills acquisition provides higher employability and better quality of life	2.65	10	Agree
6	Industries regard workers with practical competencies as important sources of competitiveness advantage and assets and agent for change	3.87	6	Strongly agree
7	Requisit skills provides stability and security at work	3.61	7	Strongly agree
8	Skills development and lifelong learning are key for employment	3.12	9	Agree
9	Acquisition of skills will prepare the students to fit in readily to employment in all sector of the economy after graduation	4.01	3	Strongly agree
10	Skills acquisition goes with high earning and productive work	3.99	5	Strongly agree

Source: Field survey, January, 2017

4.11 Responses from Accra on Importance of Skills Acquisition to a Nation

From Table 4.10, a similar trend was observed from the respondents in Accra Polytechnic. Below are the order of responses with their respective mean scores;

1. Practical training helps in equipping individuals with the essential skills to become useful in the society ($\bar{X} = 4.09$).
2. Skills acquisition provides access to better working and payment conditions ($\bar{X} = 4.08$).
3. Acquisition of skills will prepare the students to fit in readily to employment in all sector of the economy after graduation ($\bar{X} = 4.04$).
4. Skills acquisition eradicate involuntarily idleness for national development ($\bar{X} = 3.94$).
5. Industries regard workers with practical competencies as important sources of competitiveness advantage and assets and agent for change ($\bar{X} = 3.89$).
6. Requisite skills provides stability and security at work ($\bar{X} = 3.42$).
7. Skills acquisition goes with high earning and productive work ($\bar{X} = 3.39$).
8. Skills development and lifelong learning are key for employment ($\bar{X} = 3.12$).
9. Jobs can be created only with skills acquisition ($\bar{X} = 3.10$).
10. Skills acquisition provides higher employability and better quality of life ($\bar{X} = 3.02$).

Table 4.11 Responses from Accra on the Importance of Skills Acquisition to a Nation

S/N	Item	Responses		
		Weighted Mean(\bar{X})	Rank	Remarks
1	Practical training helps in equipping individuals with the essential skills to become useful in the society	4.09	1	Strongly agree
2	Skills acquisition eradicate involuntarily idleness for national development	3.89	5	Strongly agree
3	Skills acquisition provides access to better working and payment conditions	4.08	2	Strongly agree
4	Jobs can be created only with skills acquisition	3.10	9	Agree
5	Skills acquisition provides higher employability and better quality of life	3.02	10	Agree
6	Industries regard workers with practical competencies as important sources of competitiveness advantage and assets and agent for change	3.94	4	Strongly agree
7	Requisit skills provides stability and security at work	3.42	6	Strongly agree
8	Skills development and lifelong learning are key for employment	3.12	8	Agree
9	Acquisition of skills will prepare the students to fit in readily to employment in all sector of the economy after graduation	4.04	3	Strongly agree
10	Skills acquisition goes with high earning and productive work	3.39	7	Strongly agree

Source: Field survey, January, 2017

4.12 Discussion

The responses from both institutions are almost the same. They have revealed that it is expedient to acquire skills in order to stay in the competitive world of work. Job and competence of craftsmen are measured by what they can do as against how they can describe. The worth of an individual to society grows out of influence of his/her skills, knowledge and applied productive capacity to tasks that need to be completed rather than out of artificial status association attached to some glamorous jobs (Okorie, 2001).

Definit level of skill acquisition can only be attained by students through a series of collaborative and cooperative venture of practical technology both in school based and industries (Chauhan 1983).



CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a detailed summary of the results obtained from the survey. In addition, reference would be made where necessary to the appropriate literature captured in the study to support the findings.

5.1 Summary of Findings

The main purpose of the study was to comparatively analyse the practical skills acquisition in Electrical Engineering training hence, the following questions were posed as a directives to the researcher;

- i. Of what importance is skills acquisition to a nation?
- ii. To what extent are Electrical Engineering students exposed to practical training?
- iii. How adequate are facilities and resources for Electrical Engineering in Ghanaian Polytechnics?

Quantitative survey methodology was used. Kumasi and Accra Polytechnics in the Ashanti and Greater Accra Regions in Ghana were respectively selected as the study areas. The study population was made of 316 and 262 making a total of 578 students in the Department of Electrical/Electronics Engineering from the two study institutions respectively.

A sample size of 25% was randomly selected from each of the population of the two study institutions; thus 80 from Kumasi Polytechnic and 65 from Accra Polytechnic. This sample size was selected to enable the study involve reasonable number of

respondents to authenticate the outcome. Therefore, a total number of 145 questionnaires were distributed and 123 completed questionnaires were received making a response rate of 84.82%. Out of this, 73 respondents were from Kumasi while the remaining 50 were from Accra.

5.1.1 Summary on Importance of Skills Acquisition to a Nation

The findings on importance of skills acquisition to a nation's development apparently revealed the following;

- i. Practical training helps in equipping individuals with the essential skills to become useful in the society.
- ii. Skills acquisition provides access to better working and payment conditions.
- iii. Industries regard workers with practical competencies as important source of competitive advantage and assets and agents of change.
- iv. Skills acquisition eradicates involuntarily idleness for national development
- v. Acquisition of skills prepares students to fit into in all sectors of the economy after graduation.
- vi. Skills acquisition goes with high earning and productive work.
- vii. Requisite skills provide stability and security at work.
- viii. Skills development and lifelong learning are key the for employment.
- ix. Skills acquisition provides higher employability and better quality of life.
- x. Jobs can be created only with skills acquisition.

5.1.2 Summary on Extent to which Electrical Engineering Students are exposed to Practical Training

Findings on the extent to which students are exposed to practical training is minimal due to; the following factors;

- i. There is lack of training materials in both institutions and related firms.
- ii. Expendable materials required to be used together with the equipment and machines for practicals are lacking.
- iii. Budget for industrial training is highly inadequate.
- iv. The duration for industrial attachment programme is short.
- v. Difficulty in securing firms for attachment close to the place of abode is also another challenge.

5.1.3 Summary on Adequacy of Facilities and Resources for Electrical Engineering Program in Ghanaian Polytechnics

Comparatively, it was observed from the findings that

- i. Inadequate facilities and resources in the Polytechnics make practicals ineffective
- ii. Technical instructors for practical training are also inadequate
- iii. Obsolete and out-dated equipment in the Polytechnics make practical lessons ineffective.
- iv. Industry executives are not regularly invited to deliver lectures in the Polytechnics.

5.2 Conclusion

The study has significantly revealed the importance of skills acquisition to a nation's development, the extent to which Electrical/Electronic Engineering students are exposed to practical training and the adequacy of facilities and resources available for Electrical/Electronic Engineering Program in Ghanaian Polytechnics.

The following conclusions can be made from the foregoing:

- i. Acquisition of skills prepares students to fit into in all sectors of the economy after graduation.
- ii. Practical training helps in equipping individuals with the essential skills to become useful in the society.
- iii. The duration for industrial attachment programme is short.

5.3 Recommendations

From the findings, it is recommended that adequate attention should be given to practical training through:

- i. Provision of adequate training materials, facilities and resources in the Polytechnics that make practicals effective.
- ii. Ensuring that expendable materials required to be used together with the equipment and machines for practicals are available.
- iii. Realistic budget for industrial training supervision.
- iv. Extending the duration for industrial attachment programme.
- v. Building up a good relationship between Polytechnics and firms to ensure a constant admission of students for attachment in paramount.
- vi. Recruitment of qualified Technical instructors for practical training.
- vii. Provision of modern and up-to-date equipment in the Polytechnics to make practical lessons effective.
- viii. Inviting industry executives regularly to deliver lectures in the Polytechnics.

REFERENCES

- Aghenta, J. A. (1985). "Analysis of education and employment of vocational and technical school graduates: Human Resource Development Approach" in Trends in Vocational Education in Nigeria, Edited by Ehiamezor, E. T. and Adesina Segun, Nigerian Educational Research Association, p. 54-71.
- Akaninwor, G. (2004). Self method as applied to the training of vocational and technical trainers. Special method of Technology Instruction. PortHarcourt: Wilson Publishing Company.
- Aleburu JO, Olusanya RN (2007). Use of ICT to Enhance Teaching and Learning of Technical and Vocational Trades In Primary Schools. Available at <http://www.devilfinder.com>
- Amedorme, S. K., Agbezudor, K. & Sakyiama, F. K. (2014). Converting Polytechnics Into Technical Universities In Ghana Issues To Address; *International Journal of Education and Research Vol. 2 No. 5*
- Anamuah-Mensah, J. (2004). Vocational/Technological Education for Accelerated Wealth Creation: Critical Issues Facing the Nation. Paper presented at the 56th New Year School Conference organised by the Institute of Adult Education at the University of Ghana, 30 December 2004.
- Arowolo, A, A. (2010). Historical factors that influences curriculum development in industrial technical education in Nigeria. Unpublished masteral thesis, University of Nigeria, Nsukka.
- Bassauldo EA, Toby TU (2004). Instructional Development and Methods in Trades and Industrial Education. New York: Health and Company Publishers.

- Bassey MP (2000). Availability of Resources for Teaching Science Subjects in Public Secondary School. Unpublished B Sc Ed. Project: University of Lagos: Lagos Press.
- Bello H (2004). Survey of Resources for teaching electrical installation in the Government Technical Colleges of the Northeast sub-region of Nigeria. Unpublished M. Tech (Ed) Thesis; Abubakar Tafawa Balewa University, Bauchi. Bauchi State.
- Bhuwanee, T. (2006). *Reforming technical and vocational education in Sub-Saharan Africa: Case studies of Ghana - Mauritius - Tanzania and Zimbabwe*. Dakar, Senegal: BREDA.
- Chado MID (2004). Strategies for Effective Teaching and Learning Technology Education in Nigeria Minna J. Educ. Stud. 2(2): 215-227
- Colman, A. M. (2003). Oxford dictionary of psychology. Oxford: Oxford University Press.
- Dasmani, A. (2011). Challenges facing technical institute graduates in practical skills acquisition in the upper east region of Ghana. *Asia-Pacific Journal of Cooperative Education*, 12(2), 67-77. <http://www.apjce.org>.
- Douli, J.G. (2004), An overview of Nigeria's Economic reforms. Central bank of Nigeria; *Economic and Financial Review*, 42(4).
- Egwelu, J. G. (1995). The development of vocational and technical education and personnel development, *Nigeria Journal of Teacher Education*, Published by The National Commission for Colleges of Education, Kaduna, 199-208.
- Emah IE (2005). The Funding Needs of Vocational and Technical Education Programmes in Nigerian Schools System J. Nigerian Association Teachers Technol. 5(1): 18 - 21.

- Ghana Education Service (2007). *Improving the education sector in Ghana*. Accra, Ghana: Ministry of Education
- Government of Ghana (2007) Ghana's Education System . Accra.
- Hornby, A.S. (2005). Oxford advanced learners' dictionary. London: Oxford University Press.
- Leigha, M.B. (2011). Carrying capacity of Universities and skills acquisition for optimal attainment of vision 2020-20 in Nigeria. In B.G.
- Lutz, C. M. (1986). The attributes of a good leader. *Vocational Educational Journal*, 61(3), 28-30.
- Maduka, B. C. (1980). Vocational education: An asset to our national economy, *Vocational Education*, 1 (1) 21-26.
- Magbagbeola, N.O. (2004), theoretical and conceptual issues in economic sector. Central Bank of Nigeria: *Economic and Financial Review*, 42(4)
- Martey, A. N. (2010). Factors Affecting Students Participation in Technical Programmes At The Sunyani Polytechnics: Dissertation submitted to the Institute of Educational Planning and Administration of the Faculty of Education, University of Cape Coast, in partial fulfilment of the requirements for award of Master of Education Degree in Educational Administration.
- McElvery, R.H., Hall, C.H., & Lynch, R.L. (1997), Perceptions of leadership in post-secondary technical institutes in Georgia. *Journal of Vocational and Technical Education*, 13(2). 57-64.
- Naylor, M. (1986). Granting academic credit for vocational education. Eric Digest, Columbus OH: Eric Clearinghouse on Adult, Career, and Vocational Education.

- Nnachi, R.O. (2010). Enhancing skill acquisition and special needs education in Nigerian schools: A psychological perspective. *Nigerian Journal of Curriculum Studies* 17(3) 84-94.
- Nyarko, P.D.A (2011). Polytechnics education in Ghana: Challenges and problems. A paper presented at the Kick-Off Conference, NPT/UCC Project
- Ochiagha, C.C. (1995), theory and practice of career development. Enugu: Snaap Press Limited.
- Odu, O. K. (2011). Philosophical and sociological overview of vocational and technical Education in Nigeria. *American Eurasian Journal of Scientific Research*, 6(1), 52-57.
- Ogbuanya TC (2009). Energy and Technology of Home Appliances. Enugu: Cheston Ltd.
- Okorie JU, Ezeji S (1998). Element of Guidance, Vocational Career Education. Onitsha: Summer Education Publishers (Nigeria) Limited.
- Okorie, J. U. (2001). Vocational industrial education league of researchers in Nigeria, Bauchi, Nigeria.
- Olaitan, S.O. (1996), issues and analysis in vocational education. Onitsha: noble graphic publisher.
- Olaitan, S.O. (1996). Vocational and technical education in Nigeria issues and analysis. Onitsha: Noble Graphic Press.
- Oranu, R. N. (1992). Vocational education and manpower development, Vocational/Technical Education Manpower Development NVA p. 1-4.
- Osinem, E. C. (2008). Managing Agricultural Education and Training: Resources, Principles & methods. Enugu: Belony International Publisher.

- Osula, E. C. (2004). Foundations of vocational education. Enugu., Nigeria Cheston Agency Limited.
- Owolabi, H. O. (2003). Technical and vocational education in Nigeria. In J. O. Abiri (Ed.), Perspective on history of education in Nigeria (pp. 107-116). Ibadan: Emola-Jay Communications International.
- Ozoro, O. (1990). Problem areas in Nigeria education: The school curriculum-technology in secondary schools. *Nigerian Journal of Technical Education*, 1(2), 5-20. Ozoro, V. B., (1990). *Principles of Co-operative Vocational Education*. New York: Heinemann
- Puyate ST (2004). Manpower production for national development. Paper presented at the Nigerian Association of Teachers of Technology Annual Conference. Ibadan Oyo State, Nigeria.
- Roeske, J. (2003). Skills training strategies to combat worst forms of child labour in the urban informal economy: Ghana Country Study. Marseilles, France: International Programme on the Elimination of Child Labour (IPEC)
- Umar, M.K. (2010). Skills improvement required by electrical technologists for effective work performance in industries in Kaduna State. *Journal of Nigerian Association of Teachers of Technology (NATT)* 7(1)
- UNESCO, (1978). A Practical guide to international terminologies in the field of technical and vocational education, (Prelim. Ed.), Paris: UNESCO.
- UNESCO, (2005). Technical and vocational educational training.

APPENDIX

UNIVERSITY OF EDUCATION, WINNEBA KUMASI CAMPUS SCHOOL OF GRADUATE STUDIES RESEARCH QUESTIONNAIRES

The purpose of this questionnaire is to collect information on practical skills acquisition and training at the Electrical/Electronics Engineering Department at the Polytechnics. The information provided would be treated confidentially as it's purely an academic exercise.

Please, tick (✓) the appropriate check box to indicate your answer to the following questions.

Personal Information of the Respondents

1. Sex of the respondent Male Female
2. Institutions Kumasi Polytechnic Accra Polytechnic
3. Programme of study:
.....
4. Level of study Year 1 Year 2 Year 3

Please, indicate the extent to which you agree or disagree with each of the following statement by considering your institution currently.

Scale: 5= Strongly Agree; 4= Agree; 3=Not sure; 2= Disagree; 1= Strongly Disagree

1. To what extent are electrical engineering students exposed to practical training?

S/N	STATEMENT	RESPONSE				
		5	4	3	2	1
1	Budget for industrial training is highly inadequate					
2	Inadequate firms relating to students programme of study					
3	Lack of training materials in both institutions and related firms					
4	Expendable materials required to be used together with the equipment and machines for practicals are lacking					
5	Difficulty in securing firms close to place of abode					
6	The duration for industrial attachment programme is highly inadequate					
7	Practical lessons are held every two weeks when school is in session.					
8	Industry based supervisors meet attachés periodically to answer questions, guide performance and provide resources to facilitate the exercise					
9	Students are not given access to machinery and equipment to try hands on.					
10	Industry based supervisors do not allow students to assess themselves due to lack of understanding of issues					

2. How adequate are facilities and resources for Electrical Engineering in Ghanaian Polytechnics?

S/N	STATEMENT	RESPONSE				
		5	4	3	2	1
1	Poor infrastructural facilities helps practical training					
2	Inadequate facilities and resources make practicals ineffective					
3	Obsolate and out-dated equipment make practical lessons inattractive					
4	Industry provides funds specifically for research to enhance practical training					
5	Calibre of students admitted desire not practical training					
6	Industry executives are sometimes invited to deliver lessons/lectures					
7	Industry is involved in the drafting and review of curriculum for polytechnics					
8	My department carries out joint research with industry to acquire knowledge/experience necessary for practical training					
9	Inadequate technical instructors for practical training					

10. State three way(s) that, the problem of ineffecitive acquisition of practical skills can be address?

- i.....
- ii.....
- iii.....

iv. Of what importance is skills acquisition to a nation?

S/N	STATEMENT	RESPONSE				
		5	4	3	2	1
1	Practical training helps in building individuals the essential skills to become useful within the society					
2	Skill acquisition eradicate involuntarily and unproductively idleness for national development					
3	Skills acquisition provides access to better working and payment conditions					
4	Jobs can be generated in abundance only if there is an acquired skills					
5	Skill acquisition provides higher employability and better quality of life					
6	Industries regard workers with practical competencies as important sources of competitiveness advantage and assets and agent for change					
7	Requisit skills provides stability and security at work					
8	Skill development and lifelong learning are central pillar for employment					
9	Acquisition of skills will prepare the students to fit in readily to employment in all sectors of the economy after graduation					
10	Skill acquisition goes with adequate earning and productive work					