CHAPTER ONE

INTRODUCTION

Background to the Study

Education as a dynamic instrument of change, prepares its recipients for the world of work. For this to be achieved there must be provision of adequate educational resources coupled with competent teachers who will be able to impart the required skills in the graduates. Technical education is that aspect of education that leads to the acquisition of practical and applied skills as well as basic scientific knowledge. It is that education designed to prepare individuals for gainful employment and can be equated with the trainings which culminate in the acquisition of industrial experience within a work oriented society (Federal Republic of Nigeria, 2013). Recently, technical education is used as a comprehensive term for retraining in those aspects of educational processes involving the study of technologies and related sciences, and the acquisition of skills in various sectors of the economy and social life.

Polytechnics are tertiary institutions that focus on the impartation of technical skills in graduates so as to prepare them for employment or self-reliance in the labour market. The Federal Polytechnic Acts (Federal Republic of Nigeria, 2006) asserts that the polytechnic system was patterned to produce technicians and technologists for technological development with 70% science and technical education benchmark. The goals and objectives are to produce graduates that have their heads, hearts and hands used in their learning outcomes at both National Diploma and Higher National Diploma levels. The National Diploma (ND) Programme is aimed at producing technicians, while the Higher National Diploma (HND) programme is aimed at producing technologists who will be immediately employable in the labour market.

Therefore, the polytechnic education produces technicians and technologists to boost the development of the entire productive sector of the economy.

According to the Federal Polytechnic Acts (Federal Republic of Nigeria, 2006: 21), Polytechnics are supposed to:

1. provide the technical knowledge and skills for the production of technicians/technologists and other skilled personnel needed in the Nigerian economy.
2. train people who can apply scientific knowledge to solve environmental problem for the convenience of mankind.
3. give exposure on professional studies in the technologies.
4. develop and encourage the ideals of polytechnic education through Students Industrial Work Experience Scheme (SIWES).
5. conduct applied research relevant to the needs and aspirations in the Nigerian economy.

The major focus of polytechnic education is skills acquisition in technical and vocational trainings. In addition, polytechnic education is expected to assist very significantly in the process of job creation and self employment. It is a sector, distinctly created to boost technological advancement in skills and practical-oriented manpower for more productivity and sustainability. Human and material resources are germane to technical skills acquisition.

The impartation of technical skills requires quantitative and qualitative resources as well as the maximum utilization of such resources for the achievement of educational objectives. Godfrey (1996) asserts that a well selected and skilful use of resources will promote the teaching-learning process between the teachers and the students. The impartation of technical skills by the polytechnics is considered as the platform for sustainable economic development of the nation because it prepares its recipients for employment and competence required for self-reliance. The specific goals of technical education in Nigeria as stated in the National Policy on Education (Federal Republic of Nigeria, 2013) include the promotion of functional

education and skills acquisition, job creation and poverty reduction, periodic review of the effectiveness and relevance of curriculum contents that meet the requirement of labour market and the promotion of Information and Communication Technology (ICT).

The policy further advocates for the provision of trained manpower in the applied sciences, technology and business. These laudable goals can only be achieved when educational activities are learners-centred, competence-based, practice and skills acquisition-oriented with relevant and comprehensive curricula and well-equipped workshops with relevant tools, equipment and other training resources. Afeti (2007) states that the quality of training in technical educational institutions in Nigeria is low with undue emphasis on theory and certification rather than on skills acquisition and proficiency testing. Inadequate workshops and human resources, obsolete training equipment and inadequate instructional materials are some of the factors that combine to reduce the effectiveness of training in meeting the required knowledge and skill objectives in polytechnics. High quality skills' training requires qualified instructors, appropriate workshop equipment, adequate supply of training materials and practice by the learners.

Olusakin (2005) posits that technical education equips people to be able to apply scientific knowledge to find solutions to their environmental problems. According to Yakubu (2000), technical education is an instrument for technological advancement and improvement that equips its recipients with the required skills to become useful in the society. Technical education acquired in the polytechnics is an essential input required for sustainable industrial development. Polytechnic education should therefore be regarded as being important to industrialization and its graduates should become self-reliant, be able to create jobs and become employers of labour by the skills they acquire.

Kadri (2002) affirms that the significance of polytechnic education is indispensable for rapid and sustainable industrial development. According to Brand (2008), polytechnic graduates must possess the 21st Century skills and be able to apply the knowledge to solve problems. The major goal of polytechnic education is to prepare graduates for successful employment in

the labour market (Finch & Crunkilton, 1999). Okey (2007) and Nwangwu (2000) assert that industrialization and technological breakthrough can only be achieved through systematic, functional polytechnic education. However, the situational analysis in Nigeria shows that the polytechnics often produce unemployable graduates who do not possess the technical skills required in the labour market.

A study conducted by Onyene and Fabiyi (2007) on the production of skill-oriented graduates for the labour market found that the available physical and material resources used in teaching technical education were grossly inadequate. In the same vein, Ayua (2006), in a study on consolidating and sustaining industrial performance of school products in technical education for national development, reported some findings on the availability of equipment and material resources. According to Ayua, there were no standard workshops with adequate facilities for carpentry and joinery in four out of the five technical colleges studied. Many workshop tools such as plough planes, rebate planes, compass planes, tenon saws, bench vices, etc that were pre-requisites for use in the National Business and Technical Examination Board (NABTEB) practical examination were not available.

Regular supply of electricity is a major resource input that is essential in all facets of the economy to boost the required technological advancement of the nation, which was also found to be inadequate. Adebesin (2006) states that there is no technical and vocational subject that can be successfully offered at any level without regular electricity supply. Oguntoye (1987) opines that no educational system can rise above the size of funds allocated to it. Oguntoye and Alani (1998) also posit that educational expenditure has declined steadily with inflation accounting for the large increase in educational expenditure which is not reflected in improved educational services.

Dasmani (2012), in a study on the challenges facing technical institute graduates in practical skills acquisition, found that inadequate instructional materials, large number of students in the class, insufficient training facilities, inadequate qualified staff and lack of collaboration with the local industries for hands-on experience for both trainers and trainees led to ineffective and inefficient training of students while undue emphasis was placed on passing

examination. This inadequacy in preparation for the labour market brought workplace challenges to the graduates. The World Bank (Ilusanya, 2005) confirms that employers of labour are unable to select and match the right people with the right jobs when it observed that "developing countries worldwide have greatly expanded their educational and curriculum system, while millions among the educated are unemployed, millions of the jobs are waiting to be done as the people with the right educational training and skills cannot be found" (p.161).

Yakubu (2000) observes that availability and effective utilization of resources in polytechnics are essential for the success of technical education. The National Board for Technical Education (NBTE), the controlling agency of technical education including polytechnics, has set standards for programmes accreditation with respect to resources for effective teaching-learning process in polytechnics. Chukwuma (2007) asserts that today's industries do not only require competent skilled workers, but also multi-skills acquisition and capabilities. Therefore, polytechnics need to be well positioned in order to produce quality graduates that can help propel Nigeria's technological and industrial development.

Nnamchi (2008) asserts that many graduates of technical education institutions remain unemployed because they lack the requisite technical skills due to inadequate qualified staff to impart the required skills in the students. Factors that influence the acquisition of technical skills in polytechnics must be identified and adequately provided for the impartation of the required technical skills in graduates. Institutional factors on which technical skills acquisition depend as identified in this study include resource availability, adequacy and utilization; and curriculum contents' adequacy. Despite the realization of the need for well equipped graduates with requisite technical skills required in the labour market, most of the graduates remain unemployed due to poor school-to-work transition caused by failure to develop the required skills for employment.

In the past, polytechnic graduates were in high demand in the labour market in Nigeria because they were adequately trained and equipped for employment and self-reliance. Evidence from the Massachusetts Institute of Technology showed that polytechnic graduates

were considered more prepared, capable and better than graduates of conventional universities by industrial professionals (Fraser, 2008). Being central to the production of competent and skilled technologists for Nigerian industrial development, the polytechnics identified the requirement of the labour market and tailored their programmes accordingly. This equipped the graduates for employment and competence required for self-reliance. However, contemporary polytechnic graduates are considered not adequately trained or well equipped for the labour market and may not be readily employable without further trainings by their employers. Some factors must have been responsible for the deplorable state of the polytechnics; therefore there is the need to investigate the relationship between institutional factors and technical skills acquisition in the polytechnics so that the technologists they produce will be adequately trained and the former status of the polytechnics maintained.

Statement of the Problem

Employers of labour often complain about unemployability of graduates of higher educational institutions, having observed that some of the graduates do not possess the skills required in the work place which may affect their level of productivity if employed. Apart from securing paid employment, graduates of these institutions are expected to be able to create jobs. Adequate skills acquisition is required for economic development of any country. The employability or otherwise of graduates of technical and vocational education institutions depends on the relevance of the skills acquired to the needs of the economy. Technical skills acquisition institutions in general and polytechnics in particular, must therefore ensure that the skills imparted and acquired in schools meet the needs of the employers.

Some of the factors that may be related to technical skills acquisition can be located within the institutions such as the extent to which graduates are exposed to practical activities, the type of curriculum contents they are exposed to, the resources that are available to train them, the adequacy or otherwise of such resources and the extent to which they (resources) are utilized by the institutions. An empirical investigation will indicate whether or not these

institutional factors are related to technical skills acquisition among polytechnic graduates in South-West Nigeria.

Technical skills acquisition among polytechnic graduates is essential for the promotion of industrial and technological development in Nigeria. Moreover, without technical skills acquisition, it will be difficult for the country to achieve self-reliance and economic development. This may also cause polytechnic graduates to remain unemployed for some years after graduation and their desire to be self-employed will also be hampered. It is for these reasons that the factors impeding technical skills acquisition among these graduates must be explored and reported.

It was against this background, that this study investigated the relationships among resource availability, adequacy and utilization; curriculum contents' adequacy and technical skills acquisition in selected polytechnics in South-West Nigeria.

Theoretical Framework

This study considered three relevant theories: Human Capital Development theory, Signaling Theory and Systems theory; however, the study was anchored on Systems theory.

1. Human Capital Development Theory

Human Capital Development Theory (HCDT) propagated by Schultz (1971) is relevant to this study. The theory posits that human beings invest in themselves through getting educated, trained and engaged in different productive activities that make them relevant in the world of work. Thus, human capital formation positively contributes to economic development through the absorption of workers into the economy. Human capital development is at the centre of economic strength and growth; hence, the development of any organization is driven by skills and competences of its human resources. This implies that the wealth of a nation rests largely on its energies and talents.

Human Capital Development Theory equates workers' knowledge level with the level of skills acquired which will lead to higher productivity; therefore, there is a direct relationship between acquired skills and productivity. The relevance and significance of graduates are

determined by the level of skills acquired during their training. Investment in technical education is meant to increase the stock of human capital by imparting knowledge, skills, abilities, and attitudes required for productive activities.

2. Signaling Theory

Michael, S.C. (2009) propounds signaling theory as an alternative to Human Capital Development Theory. According to Michael, structural unemployment was caused by a mismatch between the skills acquired and the needs of employers. In other words, there is increasing recognition that human capital may be specific to particular jobs or tasks that are not readily transferable. Recent works attempted to improve the linkages between education and the needs of the labour market by linking labour market demands to technical skills acquisition. Michael opined that a mismatch between the acquired skills and labour market demands will render graduates unemployable; hence polytechnic graduates should acquire skills that align with the labour market demands. The relevance of the theory to this study lies in Michael's proposition that graduates should acquire skills that align with the labour market demands as this will make such graduate to be readily employable after graduation.

3. Systems Theory

The systems theory was formulated by Ludwig Von Bertalanffy who emphasized on the interdependence and interrelatedness of different units within a system (Bertalanffy, 1998). Systems are characterized by differentiation and integration. Differentiation identifies subparts or components of the system that perform specialized functions while integration keeps the system together through the coordination and supervision of the sub systems. The Systems Theory requires the processing of some inputs to obtain the required output. It is the collection of interrelated parts to form a whole, with each part affecting the whole system. A system performs specific functions, through subsystems which are interrelated to each other in specific ways so that they perform adequately the purpose of the whole system.

From the above definitions, systems theory is the most relevant of the three theories considered in this study because of its holistic view of phenomena that shows the nature of

the relationship among parts that lead to the realization of the desired output in the polytechnics. Technical skills acquisition in polytechnics requires inputs such as students, lecturers, lecture rooms, library, workshop, equipment, ICT, electricity, gas, machinery, transportation, consumables, instructional materials, etc. These resources must be available and adequate. These resources are processed through the curriculum content, teaching-learning process, instructional method, resource utilization, etc to acquire technically skilled, employable, productive, creative, self-reliant and entrepreneurial graduates that are required for economic and industrial development of the Nigerian economy.

The systems theory is germane to technical skills acquisition because it guides the planners and administrators to clearly identify the actual inputs required for technical skills acquisition and the alternative lines of action. The open systems theory which relates with the environment for survival, is particularly relevant to this study because the operation of the polytechnics requires the use of inputs that relate with the environment, taking some ingredients or inputs to be procured in order to obtain the desired outputs which are returned back to the environment for assessment so that necessary adjustment could be made.

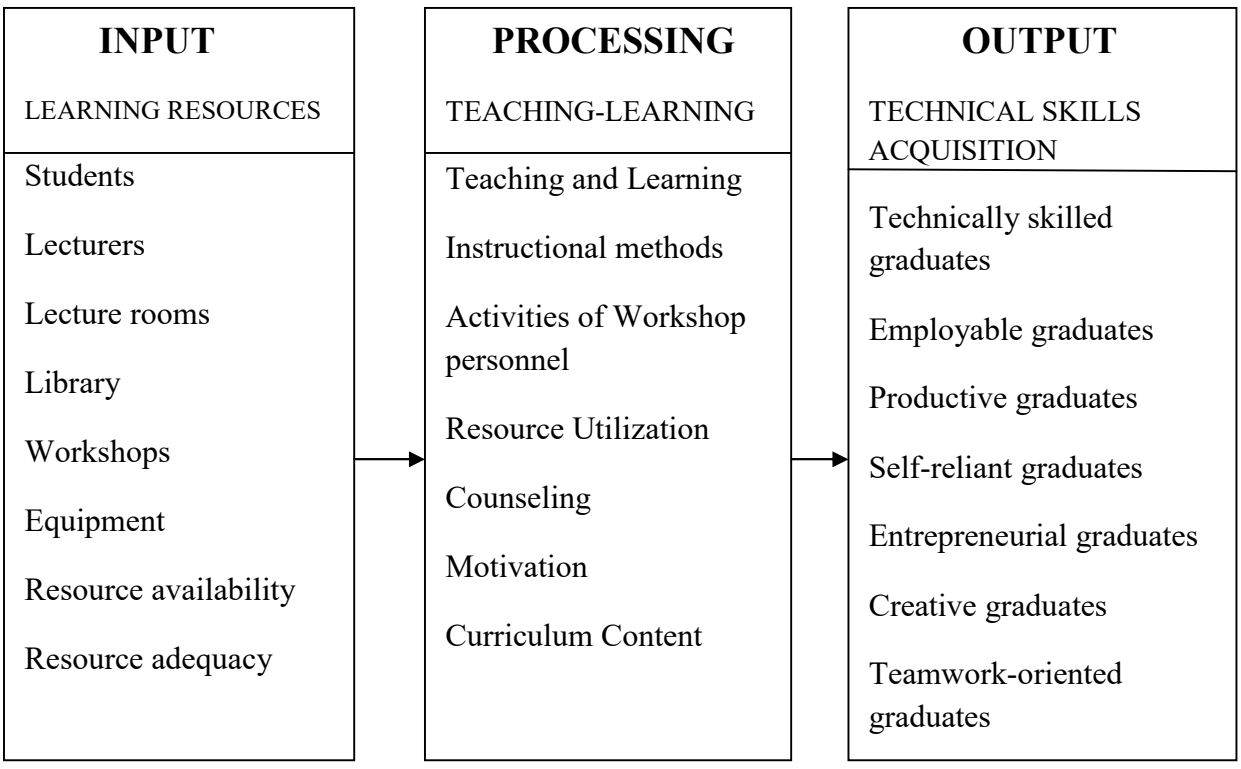

Figure 1: Conceptual Framework on the Relationship between Institutional Factors and Technical Skills Acquisition in the Polytechnics

Source: Researcher

Figure 1 shows a Conceptual Framework that explains the relationship among the variables when processing the inputs to produce the needed output. The framework is a simplified diagram with some characteristics that show the variables in an apparent interactional relationship. The inputs consist of basic resources such as lecturers and students, lecture rooms, library, workshops, resource availability and adequacy which are required ingredients to be processed and converted to the needed output. The processing is done in the polytechnics through teaching-learning process, instructional methods, activities of workshop personnel, resource utilization, counseling, motivation and relevant curriculum contents. The output consists of technical skills acquisition for the production of technically skilled, employable, productive, self-reliant, entrepreneurial, creative, and teamwork-oriented graduates.

Purpose of the Study

The broad objective of this study was to investigate the relationship between institutional factors and technical skills acquisition in selected South-West Nigerian polytechnics. Specifically, the study sought to:

1. investigate the level of resource availability for technical skills acquisition in South-West Nigerian polytechnics.
2. determine the resource adequacy for technical skills acquisition in the polytechnics.
3. ascertain the frequency of resource utilization for technical skills acquisition in the polytechnics.
4. examine the curriculum contents' adequacy for technical skills acquisition in the polytechnics.

5. ascertain the difference in technical skills acquisition based on students' programmes in the polytechnics.
6. examine the difference in technical skills acquisition based on ownership of the polytechnics.
7. investigate the difference in technical skills acquisition between male and female students in the polytechnics
8. determine the joint contributions of resource availability, adequacy and utilization; and curriculum contents' adequacy to technical skills acquisition in the polytechnics.
9. determine the relative contributions of resource availability, adequacy and utilization; and curriculum contents' adequacy to technical skills acquisition in the polytechnics.

Research Questions

The following research questions were raised to guide the study:

1. What is the level of resource availability for technical skills acquisition in South-West Nigerian polytechnics?
2. To what extent are the resources adequate for technical skills acquisition in the polytechnics?
3. How frequent are the resources utilized for technical skills acquisition in the polytechnics?
4. How adequate are the curriculum contents for technical skills acquisition in the polytechnics?
5. To what extent do resource availability, adequacy and utilization; and curriculum contents jointly contribute to technical skills acquisition in the polytechnics?
6. What are the relative contributions of resource availability, adequacy, utilization and curriculum contents to technical skills acquisition in the polytechnics?

Research Hypotheses

The following hypotheses were formulated to guide the study:

1. There is no significant relationship between the level of resource availability and technical skills acquisition in South-West Nigerian Polytechnics.
2. The resource adequacy is not significantly related to technical skills acquisition in the polytechnics.
3. The frequency of resource utilization has no significant relationship with technical skills acquisition in the polytechnics.
4. There is no significant relationship between curriculum contents' adequacy and technical skills acquisition in the polytechnics.
5. There is no significant difference in technical skills acquisition based on students' programmes in the polytechnics.
6. Technical skills acquisition is not significantly different in the polytechnics based on ownership.
7. There is no significant difference in technical skills acquisition between male and female students in the polytechnics.

Scope and Delimitation of the Study

The study was delimited to technical skills acquisition by technologists produced in selected South-West Nigerian polytechnics. The South-West Zone is where the oldest and the highest number of polytechnics were established in Nigeria. The independent variables in this study were: resource availability, adequacy and utilization; and curriculum contents' adequacy, while the dependent variable was technical skills acquisition.

The study focused on Civil, Mechanical, Electrical/Electronics and Computer Engineering programmes at HND II level in engineering technology. The Engineering Technology programmes were part of the seven technology-oriented programmes stratified groups by NBTE (2001) in polytechnics and because the programmes had been accredited. National Diploma (ND) students were excluded because only HND II students who possessed five years experience, being in their terminal stage were in

a better position to assess polytechnic education in relation to technical skills acquisition. Ondo and Ekiti States were not selected for the study because the two States had only one polytechnic each during the data collection while the other States in South-West Nigeria had between five to eight polytechnics.

Significance of the Study

The study is significant to the students, government, polytechnic administrators, industrialists and NBTE in the following ways:

To the students, the study articulated the importance of technical skills acquisition in polytechnics for the promotion of graduates' self-reliance and employability in the labour market in order to reduce the rate of graduates' unemployment.

The result of this study would motivate the government and educational planners to plan polytechnic education better for improvement in service delivery.

The study would offer polytechnic administrators better administrative procedures on technical education and develop positive attitude towards skills acquisition in contrast to pure academic culture and preference for white collar jobs.

The outcome of the study would motivate industrialists to liaise with the polytechnics through Students Industrial Work Experience Scheme (SIWES) to foster school-industry linkage for the production of employable graduates.

The findings of the study would provide NBTE with practical suggestions on how to promote the coordination and accreditation compliance in the polytechnics.

The result of the study would provide empirical data to initiate effective implementation of technical skills acquisition policy in the polytechnics.

The effectiveness of the workshop staff would be enhanced by resource availability, adequacy and utilization; and curriculum contents' adequacy that would foster the teaching-learning process in the polytechnics.

Operational Definitions of Terms

The following terms have been defined operationally:

Curriculum Contents' Adequacy: This is when the curriculum is learner-centered, competence-based and practice-oriented with adequate content coverage for technical skills acquisition in the polytechnics.

Educational Resources: These are the sum total of the inputs that go into the polytechnics to support, facilitate and influence teaching-learning process. Such resources include lecture rooms, workshops, personnel, libraries, electricity, gas, ICT, consumables, instructional materials used for the acquisition of technical skills in the polytechnics.

Employability: It means the degree of ease at which polytechnic graduates secure paid employment or are self-employed based on the skills they possess.

Institutional Factors: These are resources that are present within the polytechnics and are related to the teaching-learning process for technical skills acquisition.

Institutional Ownership: This has to do with the authority that establishes, owns and manages the polytechnics such as the Federal, the State and Private ownership

Resource Adequacy: This is the extent to which the relevant resources are adequate for technical skills acquisition in the polytechnics based on NBTE's specifications for accreditation.

Resource Availability: It describes the extent to which the essential resources for technical skills acquisition are on ground for use in the polytechnics.

Resource Utilization: It is the frequency of use of the resources by staff and students for the impartation and acquisition of technical skills and competence in the polytechnics.

Technical Skills: These are the skills possessed by polytechnic graduates that require the ability to identify and use certain equipment and machines to do certain work or perform certain operations.

Technical Skills Acquisition: It is the process of acquiring technical skills that will enable the polytechnic graduates to be employable or be self-reliant.

Workshop Personnel: They are technical staff members that attend to polytechnic students in the workshops for practicals.

CHAPTER TWO

LITERATURE REVIEW

The review of literature in this study focused on related concepts and variables used in the study. Specifically, the literature review covered the following sub headings:

1. Polytechnic Education in Nigeria
2. Challenges facing Polytechnics in Nigeria
3. Concept of Technical Skills Acquisition
4. Resource Availability and Technical Skills Acquisition
5. Resource Adequacy and Technical Skills Acquisition
6. Resource Utilization and Technical Skills Acquisition
7. Curriculum Contents' Adequacy and Technical Skills Acquisition

Polytechnic Education in Nigeria

Polytechnics are tertiary institutions that focus on the impartation of technical skills in graduates so as to prepare the graduate for employment or self-reliance in the labour market. The Federal Polytechnic Acts (Federal Republic of Nigeria, 2006) asserts that the Polytechnic system was established to produce technicians and technologists for technological development with 70% science and technical education benchmark. The goals and objectives of polytechnic education are to produce graduates that have their heads, hearts and hands used in their learning outcomes at both National Diploma and Higher National Diploma levels. The National Diploma (ND) Programme is aimed at producing technicians, while the Higher National Diploma (HND) programme is aimed at producing technologists who will be immediately employable in the labour market.

The polytechnics produce technicians and technologists to boost the development of the entire productive sector of the economy. Polytechnics play a vital role in the educational, scientific and technological progress of Nigeria. Polytechnics were established to train and produce the technical manpower required for national development plans, goals and

strategies. Technical and Vocational Education (TVE) is disseminated through formal and informal institutions, with the Polytechnic being the principal provider in Nigeria. Polytechnics offer a two-year course of study, leading to the award of the National Diploma (ND), after which students are expected to go for 1-year industrial attachment to acquire requisite knowledge on the job and practical experience before proceeding for Higher National Diploma (HND) programme that runs for additional two years.

Technical education is one of the aspects of Nigerian education in which its curriculum was designed to enable the beneficiaries use both the hand and the brain while learning. However, this aspect did not develop quickly in Nigeria and that invariably affected the Nigerian industrial and technological development. There should be a balance between technical and general education so that the two can complement each other.

Oguntoye and Alani (1998) emphasize the need to enhance human development. They assert that opportunities must be created for the people to develop their abilities to ensure personal dignity and self respect. Onyene and Fabiyi (2007) state that quality assurance in education was concerned with the maintenance and improvement of quality in educational services rendered and its relevance to the society as well. For any quality assurance measure to be effective, it has to consider the functionality of the input, processes and output. Quality and practical education certainly transcend passing examinations and acquiring certificate as a proof of learning. It involves being able to adequately translate theory into practice.

The prevalent manpower situation in Nigeria today is generally characterized by large-scale unemployment for those without special skills or relevant training (Ejiogu, 2000). Every facet of the economy has been affected by lack of skilled technicians. The neglect of technical education is socially and economically injurious because it robs the nation of the contributions the graduates would have made to national development. The existence of a divergence between the world of learning and the world of work in Nigeria is acknowledged by the existence of gaps between the education systems and the labour market (Ukpong, 2001). Ukpong further noted that the dire consequences generated by this, namely the human

resources wastage in its various forms and the emergence of a dangerous phenomenon of educated unemployed in the labour market, need urgent attention. Nigeria cannot develop without well-equipped technical and vocational institutions. In fact, lack of this is the missing link in Nigeria's development plans. Dike (2005) advised Nigeria to begin to make very serious investments in education and skills training as no nation can compete effectively in the emerging global market place with poorly educated and unskilled workers.

The earliest development of formal technical education was from the non-governmental efforts of the Presbyterian Church of Scotland, which established the Hope Waddell Institute, Calabar in 1895, some 50 years after the first systematic introduction of Western Education by Christian Missions with the Methodists taking the lead in 1843 in Badagry. Technical education did not attract government attention until the world economic depression in the 1930s made it uneconomical for the colonial administration to continue to bring expatriates to meet its needs. Formal education up to that time was primarily aimed at producing clerks, interpreters and primary school teachers for the sustenance of colonial administration as well as commercial establishments.

The first form of any meaningful development of technical education and training started with the setting up of training schools to produce "middle-level" technical manpower in some departments of the civil service, with each school being managed by its respective department where training was geared mainly towards departmental needs. Some of these schools were established before the depression of the 1930s, such as the Survey School established in 1906, for the training of Survey assistants. Other technician training schools were established by the Marine Department, Nigerian Railways, the Public Works Department (PWD), the Department of Agriculture, the Department of Health, Department of Posts and Telegraphs (P & T), etc. The Yaba Higher College, established in 1932, also offered training including technical trainings and diploma programmes which lasted at least four years. The diploma although of high standard, was rated lower than the bachelor's degree. This led to agitations for the status of Yaba Higher College to be raised to degree awarding.

In 1943, the colonial administration set up a Commission of Higher Education in West Africa under the Chairmanship of Sir Walter Elliot. At the conclusion of its work in 1945, the Commission recommended the establishment of a university college at Ibadan and to close down Yaba Higher College. In January 1948, students of Yaba Higher College were transferred to the new University at Ibadan as the first undergraduates of the University College. The facilities and buildings of the defunct Yaba Higher College were converted to establish Yaba Technical Institute in 1948, to provide more economically the training given by several government departments. The Elliot Commission had envisaged a future need for the establishment of similar technical institutes in Kaduna, Enugu and elsewhere. Subsequently, the then regional governments established additional four technical institutes to the original one in Yaba as outlined below:

(i). Technical Institute Yaba, established in 1948 by the then Colonial Administration

(ii). Technical Institute Kaduna, established in 1956 by the then Northern Regional Government

(iii). Technical Institute Enugu, established in 1958 by the then Eastern Regional Government

(iv). Technical College Ibadan established in 1960 by the then Western Regional Government

(v). Mid-West Technical College established in 1964 by the then Mid-Western Government

The five institutions owned by five different Governments under five different enactments and standards became the fore-runners of the first generation Polytechnics in Nigeria. Curricula from different cultural backgrounds and varied levels of industrial development were adopted as the proprietary governments deemed suitable.

At the eve of Nigeria's Independence in April 1959, the Federal Minister of Education appointed a Commission on post-school certificate and higher education under the Chairmanship of Sir Eric Ashby of Cambridge University, United Kingdom. The Commission which submitted its report in September 1960, just before independence, noted that the major defect in the Nigerian educational system was its strong bias towards the

"traditional literary and academic subjects which led to lack of respect for manual and technical achievement". Subsequently the technical institutes were expanded and upgraded. Yaba Technical Institute (established 1948) became Yaba College of Technology in 1963; Technical Institute Kaduna (established 1956) became Kaduna Polytechnic in 1968. The Technical Institute, Enugu (established 1958) became College of Technology (and later Institute of Management and Technology) in 1965; and Mid-West Technical College (established 1964) became Auchi Polytechnic in 1972.

Following the discovery that there was surplus of academic/literary graduates at the expense of basic craftsmen and technicians critically required for development in Nigeria, steps were accordingly taken to provide for these shortages through expansion of training facilities as well as a "crash programme" of overseas training. The Federal Government also resolved to provide one technical college and one polytechnic in each State of the Federation to complement the efforts of State Governments. As a result, over 6,000 Nigerians were sponsored overseas to pursue 2-3 year programmes leading to various qualifications, mainly for technicians and craftsmen levels, in many countries including United States of America, United Kingdom, Bulgaria, Hungary, Yugoslavia, etc.

During the second and third Development Plan periods which coincided with the "oil boom" era, 19 additional polytechnics, many of them owned by State Governments, were established. Many States established polytechnics as a result of the Federal Government's policy of providing matching grants of 50% of both recurrent and capital expenditures. The Federal Government also established six additional polytechnics during the period. Thus by 1988 the number of polytechnics had risen to 27.

Technical education is essential for the development of all sectors of an economy, particularly those of developing economies such as Nigeria. The type of technical manpower required for economic development includes: low level (trade test, city and guild, and NBTE certificates), middle level (NCE, ND and HND) and high level (B. Tech), B Sc, M Sc and Ph. D) manpower. Low level manpower is trained in technical colleges as artisans, while the high

level manpower is trained in the universities as engineers. The polytechnics specialize in the training of technicians and technologists. Those who complete the National Diploma (ND) are employed as technicians, while the holders of Higher National Diploma (HND) qualify as technologists. The urgent need for the impartation of technical skills in technicians and technologists that were produced in the polytechnics for industrial development in the Nigerian economy informed this study.

Yakubu and Mumah (2005) assert that following the rapid growth of polytechnic education, it had become clear that there was need to have a nationally accepted standard for technical education. In 1972, the then National Science and Technology Development Agency (which later metamorphosed to Federal Ministry of Science and Technology) set up a Working Committee on Scientific and Technical Manpower and Science Education, which submitted a report on middle-level technical manpower and their training. The Committee further recommended that a National Board for Technical Education be established to be in charge of the implementation of its recommendations.

In August, 1985 and January 1993 respectively, the Federal Government enacted Act 16 (Education National Minimum Standards and Establishment of Institutions Act) and Act 9 (Education National Minimum Standards and Establishment of Institutions) Amendment Act). With these Acts, the functions of the Board were extended to include the establishment and maintenance of minimum standards in polytechnics and other technical institutions in the Federation, accreditation of academic programmes in all technical and vocational education institutions for the purpose of award of national certificates and diplomas and other similar awards, and recommendation for the establishment of private technical institutions in Nigeria.

Another major area the Board looked into towards the maintenance of standards is introduction of Internal Quality Assurance Mechanisms at the polytechnic level. Since the establishment of NBTE, the polytechnic sector has continued to grow under a regulated and orderly comportment. Following the report of the Commission on the Review of Higher Education in 1990s and beyond (the Gray Longe Commission), the colleges of agriculture

came under the supervision of the NBTE in terms of regulation and quality control. Thus the responsibilities of the Board now cover colleges of agriculture and other "single-discipline" institutions called "monotechnics". Another outcome of the Gray Longe Commission was the promulgation of the National Minimum Standards and Establishment of Institution (Amendment) Act which approved private ownership of polytechnics and monotechnics in Nigeria.

Challenges facing Polytechnics in Nigeria

In spite of its numerous contributions and unquantifiable relevance to the developmental aspirations of Nigeria, polytechnic education continues to face fundamental challenges that affect its growth, development, image, achievement, performance and contributions to national economic growth and prosperity. Such challenges include: the irrelevance of the curricula, inadequate competent teachers, obsolete training equipment, lack of quality assurance, discrimination, inadequate students' industrial work experience scheme,

The pertinent question on the nation's polytechnics' curricula is how appropriate, relevant and up-to-date are these curricula? Do they meet the needs of employers, industries and society at large in the age of convergence of information and communication technology? How well have the curricula been able to impart the desired skills on the trainees? The answers to these questions seem negative. Some of the curricula had been in use for 15 years without review. The National Board for Technical Education (NBTE) saw this as a challenge and with the help of UNESCO started a in February 2001 with the major component of commencing the process for the review of over 130 curricula in the Board's portfolio for polytechnics, colleges of technology and monotechnics.

Under the UNESCO-Nigeria Project for the Revitalization of Technical and Vocational Education in Nigeria, the revision and updating of core engineering curricula used in the polytechnics has already been completed. A major aim of the review is to make the curricula more practice-oriented in line with global trends and be more demand driven and more responsive to the market.

Other major components of the project are the introduction of entrepreneurship education and incorporation of information and communication technology throughout the revised curricula. The combined objectives of these two major components, is to achieve the production, at the polytechnic level, of technicians and technologists who after a few years of further experience would be able to access micro-credit facilities and set up their own small businesses centers around the skills and expertise the graduates have acquired and be more readily employable having possessed skills needed by employers.

Inadequate number of relevant and competent teaching staff is largely due to the fact that the sector does not produce its own teaching staff. It relies on the universities for the training and development of its staff. There is also no laid down system of industrial training for the teaching staff so that the staff can acquire industrial and practical experiences which they do not get sufficiently in the universities during their training programmes, but which they need, if they are to be effective and efficient trainers in the polytechnics.

The recruitment of academic staff of the right caliber is a serious problem confronting many polytechnics. The situation is worse in the case of institutions located in the rural areas, where it is more difficult to attract highly skilled professional manpower in fields such as accountancy, law, engineering, computer science, etc. Many such polytechnics have to rely on part-time lecturers drawn from neighbouring institutions located in the urban centers to teach some courses. This does not ensure commitment on the part of the staff or any measure of effective control over such staff.

To address these problems, the Board has included in its Medium Term Sector Strategy (MTSS) a provision for systematic training and retraining of polytechnic staff according to the areas of their deficiency. However, a condition for achieving the transformation of the teaching staff to fully competent professional status is the reversal of the underlying discrimination policy provisions that affect both the products of the system, especially holders of the Higher National Diploma (HND) as well as staff in the polytechnics, where barriers on career progression have been placed on both the graduates (HND holders) and the

staff on Grade Level 14 (HATISS 12) and HATISS 14 respectively. The removal of such discrimination will enhance career progression through skills acquisition and academic competence. The polytechnics will then be able to compete for the best and competent staff from both the public and private sectors. It will further stop "leakages" at the top where academic staff leave the system for greener pastures in the universities and elsewhere, as soon as they reach the bar of HATISS 14, or have acquired a terminal degree.

Many polytechnics are now facing the problem of inadequate and obsolete training equipment, especially for science and technology programmes. Many of the equipment are obsolete and spare parts are no longer available. The equipment also lack current levels of precision that are now the standard. A lot of the equipments are far below current industrial and training standards. Polytechnics can operate satisfactorily only with adequate infrastructure such as electricity, water, gas, communication and transportation. Workshops and Laboratories require and consume a lot of electricity, water and gas. It was discovered during data collection that some institutions rely completely on generators for electricity and boreholes for water. In many, the locations of such polytechnics place them outside public utilities. In these conditions, performance can only be at the level of availability of these utilities.

The National Minimum Standards and Establishment of Institutions Act No 16 of 1985 places on the Board the responsibility of the maintenance of standards in Nigerian polytechnics. Quality is maintained through a process of accreditation of academic programmes undertaken by the Board. This is designed to ensure relevance of curriculum by assessing the context, input, process and products periodically. Accreditation usually involves an inspection visit by a team, representing all the major stakeholders for the specialization including lecturers, professional/regulatory bodies, employers, etc, to carry out a comprehensive assessment of the programme being accredited. This assessment involves not only the academic content but also the administration of the programme, funding, qualifications, adequacy of space for both staff and students among others.

Accreditation is usually subject to renewal after a period of five years. No polytechnic, monotechnic, technical college or any other institution in Nigeria can offer any technical-related course without NBTE's prior approval. The Board periodically publishes a directory of accredited programmes for the guidance of employers and the general public. Over the past two decades, the Board visited thousands of programmes in TVET institutions in Nigeria. Another factor which has been identified is the absence of internal self-evaluation or internal quality assurance (IQA) mechanism that would monitor compliance with minimum standard requirements on continuous basis. As a result, standards often tend to decline after accreditation visit, rather than being maintained or improved upon, as expected. The establishment of Internal Quality Assurance (IQA) units, with clearly defined roles, is being considered as requirement for all institutions as part of quality assurance reform process.

In spite of its numerous contributions and unquantifiable relevance to the developmental aspirations of Nigeria, polytechnic education has suffered considerable encumbrances over the years, manifestation of which is directly reflected on its graduates. Yakubu (2005) posit that the polytechnic graduate (HND holder especially) is seen by the society as a ''second best" to his university counterpart. Yet many HND holders continue to out-perform their university counter-parts in many fields such as accountancy and many branches of engineering. The cause of this lies in historical antecedent. The colonial government in Nigeria had entrenched elitist ''white collar'' education as preferable to technical ''blue collar'' education. This unfortunate attitude was inherited and promoted by our political elite. This attitude has now permeated the whole segment of the society, such that technical schools and institutions are regarded as a place for the "academically indigent students". The products from the system are often referred to as "middle level manpower".

The pertinent question now is what are the criteria for classifying graduates into "middle level"and"high level manpower? Could a well trained skilful and competent technician with good practical knowledge and high productivity be classified as "middle level'' manpower simply because such graduates trained in a polytechnic, and his counterpart that went to a university be regarded "high level" manpower even if he does not possess the same type and

level of skill as the technician? Absurd as this may seem, it constitutes the main criterion upon which the polytechnic graduates are rated today.

Apart from employment-related problems, the polytechnic graduates also encounter academic progression problem. At present, polytechnic graduates cannot run full post-graduate programmes because such graduates find themselves terminating their academic pursuit at HND level, and for those desirous of further education, the only option is to undertake further training in a university, known as "Bridge Programme". This implies that the graduates cannot build on their practical background and disposition.

Similar to the academic problem, is the issue of professional recognition. Although, this appears to be more subtle as HND holders have gained parity acceptance with university graduates for entry into most professional examinations, except engineering which happen to be one area that the polytechnic graduates have excelled considerably especially among the industry-based organized private sector operators. Faluyi (1993) states that many employers claim that they find those now being registered as technologists being more useful to them as the registered engineers than their university counterparts. HND graduates should be given opportunity by the Nigerian Society of Engineers (NSE) to sit for its professional membership examination as it is the case with university graduates.

Polytechnic education with its practice-based teaching and learning has two major components: Academic Planning and Work Experience orientation with standards prescribed for both. The scheme is of four months duration and it is designed to extend classroom learning into the world of work. This gives students undergoing the work experience after ND II opportunities to relate theories learnt in the classroom to real life situations in the work place.

Polytechnic education is structured to produce technicians and technologists respectively after 2 years of study for ND and 2 years of further studies having done one year industrial attachment as an admission requirement for HND programmes. For the polytechnic sector to make its appropriate mark in the economic development of the country, its graduates must

obtain sufficient industrial skills during their training. In order to strengthen the practical content of polytechnic education and introduce students to the world of work while in the course of their training, the Student Industrial Work Experience Scheme (SIWES) was established. This scheme is a vital component of polytechnic education since the technologists are produced through the process of education, training, experience and continuing education. Unfortunately, owing to insufficient openings for placement and for fear of damage to their expensive equipment, students accepted for practical training by industries are not allowed to carry out the practical work that the graduates need (Faluyi, 1993). A lot of them are also placed in irrelevant industries where experience gained does not enhance their training.

The experience of the SIWES units in all technical institutions under the Board's purview show that the industries, SMEs included, which are major stakeholders in technical education, are not giving the desired cooperation to make this scheme a success. This is so because the industries fail to offer places for students to participate in the scheme and where the industries do, there is no commitment to make the students benefit by providing adequate supervisions. Industries will need to reverse this negative trend and provide the maximum possible opportunity for students to learn and to acquire the necessary skills. Some significant budget provisions for this may be required, but it must be noted that the ultimate gain will be to get trained manpower into jobs without additional training. Industries, SMEs and employers should provide maximum possible opportunity for students to learn; after all they would be the greatest beneficiaries.

According to National Policy on Education (FRN, 2013), technical education at the tertiary level is provided at the polytechnic and colleges of technology. Technical education constitutes a major back bone in the development of any nation. It is essential for capacity development in national development since it is the key to the production of skilled manpower for technological advancement and economic growth. Technical education continue to suffer set back in Nigeria because of the erroneous belief that polytechnic education is for those who are not academically sound and so could not secure admission into

the Universities. Technical and vocational education is that aspect of education that exposes the learner to acquisition of skills that could be transformed into economic benefits. Akerele (2007) asserts that the knowledge acquired is usually geared towards coping with the current challenges.

According to UNESCO's (2001) view, Technical and Vocational Education (TVE) is a comprehensive term referring to those aspects of educational process involving, in addition to general education, the study of technology and related-science and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic and social life. In Nigeria, TVE is that type of education given in institutions providing both scientific knowledge and practical skills for a specific trade, employment or profession, as crafts men, technicians, technologists and scientists of similar levels in business fields or engineering and applied sciences. Technical and vocational education encompasses all practical or skillful knowledge, which the society requires to triumph over economic backwardness.

Madumere (2007) asserts that the emphasis on vocationalism in the 21st century is to bring about social and economic improvement through application of technical knowledge. In Nigeria, many people go to school with the aim of acquiring education that will enable them participate fully in the society. Full participation in Nigerian society requires vocational and technical education at all levels of our education system, which will recognize the different skills and abilities and give an equal opportunity to all children to prepare for work. Furthermore, the mission of vocational and technical education is not only to provide definite training in various occupations, but also to relate that training to Science, Mathematics, Geography, etc which is useful to the society.

Technical and vocational education is disseminated through formal and informal institutions, with the polytechnics being the principal provider in Nigeria (NBTE, 2011). Polytechnics play vital roles in the educational, scientific and technological progress of Nigeria. Polytechnics were established to train and produce the technical manpower necessary for

executing the nation's development plans, goals and strategies. Polytechnics have been in the forefront of technical manpower production for over 50 years. The National Council on Education approved National Board for Technical Education (NBTE) in 1977 and brought classification of technical and vocational institutions into the following:

1. Vocational schools; which are made up of vocational/artisan training centers to produce artisans.
2. Technical colleges which produce crafts men at the craft level and masters craft men at the advanced craft level.
3. Polytechnics/Colleges of Technology/Monotechnics which are post senior secondary school institutions which produce technicians and technologists for national development.

The scarcity of technical personnel and problem of their production in the required quantity constitutes the greatest obstacle to Nigerian technological advancement (Yakubu, 2005). The inadequate supply of technicians has nearly grounded to a halt the technological services in the country such as telephones, electrical supply, refineries, etc. The critical factors hindering the development of TVE in Nigeria include negative attitudes of society towards vocational education, defects in the structure of TVE system, inadequate provision of instructional materials and tools and equipment, poor or lack of maintenance of available materials and equipment, lack or inadequate supply of qualified technical teaching staff, curriculum that does not reflect the reality of the economy, inadequate funding of technical and vocational education, and poor provision of educational infrastructure.

Technical education is positively highly related to economic development. Tinbergen (1952) in his positivist analytical economic theory model asserts that with investment, there is a parametric change on the endogenous variables of an economic system. Tinbergen further opines that investment in technical education is expected to have utility effects on all sectors of the economy and should influence the rate of economic development.

Hu, Lee and Stremsdorfer (1971) investigated the economic return to investment in TVE in comprehensive high school in United States of America (USA), using multiple regression analysis. They found that the monetary returns of TVE graduates were higher than those of comprehensive high school graduates. Though they focused on secondary level of education in USA while this study focused on polytechnic level in Nigeria; the two studies are similar.

Briggs (1979) found that the rate of returns to investment in education workers in technical schools were higher than those of other institutions because of the higher level of skills embodied in the products of technical education. There is a significant correlation between investment in TVE and economic growth because TVE enhances higher productivity of workers. Briggs (1979) and Lanrewaju (1994) found a positive link between TVE and economic development.

Concept of Technical Skills Acquisition

According to Awhinana (2008) skill is the expertise, practiced ability, dexterity and tact for the performance of certain works or operations. It can be seen as a sequence of organized actions, proficiency executed and usually displaying a flexible but systematic temporal patterning. It involves the acquisition of performance capability. Awhinana asserts that skills development is the ability to do or to perform an activity that is related to some meaningful exercise, work or job. Skills development is important for harnessing a nation's natural resources and for promoting economic stability. Technical skills are the knowledge and abilities needed to accomplish mathematical, engineering, scientific or computer-related duties, as well as other specific tasks relating to technology. Those with technical skills are often referred to as technicians, such as audio technicians, electronics technicians or engineering technicians. Technical skills can also refer to the ability to perform tasks that require the use of certain tools and technology that is practical in nature as to complete a designated task.

The acquisition of technical skills requires specific education or training, often with a hands-on learning component. Technical skills acquisition in this study refers to the possession of the knowledge and abilities for analytical applications, statistical analysis, repairing, database

design, assembling, configuration, adjusting, computing, calculation, coding, statistical compilation, quantitative reports, proficiency, quality control and assurance, word processing, electronic presentation, web navigation, website design, video conferencing, IT optimization, networking, etc. To acquire skills is to demonstrate the habit of acting, thinking and behaving in a specific activity in such a way that the process becomes natural to the individual through repetition or practice. The acquisition of skills varies with the nature, complexity and the type of activity. Individuals who opt for skills acquisition should, among other things possess qualities such as interest, ability, aptitude, patience, personality characteristics and other human and physical qualities that would enable such industries to succeed in it.

Technical skills acquisition is the master key to national development through which the goals of Education for All (EFA), National Economic Empowerment and Development Strategies (NEEDS), Sustainable Development Goals (SDGs) and the Nigerian Vision 20:2020 can be achieved through the emergence of competent and adaptive workforce by technical education. It is through a sound and well articulated technical skills acquisition programme that appropriate technical skills can be developed for the Nigerian economy. In line with the above, technical skills acquisition provided at the tertiary level in polytechnics and colleges of technology is central to the training and production of competent and skilled technicians and technologists needed for industrial development.

According to the report of Ashby Commission on Post-secondary School Certificate and Higher Education in September (Ashby, 1960), the major defect in the Nigerian education was its strong bias towards the traditional literary and academic subjects which led to lack of respect for manual and technical achievement. Subsequently, the technical institutes were expanded and upgraded. Thus Yaba Technical Institute (established 1948) became Yaba College of Technology in 1963; Technical Institute Kaduna (established 1956) became Kaduna Polytechnic in 1968. The Technical Institute, Enugu (established 1958) became College of Technology (and later Institute of Management and Technology) in 1965; and Mid-West Technical College (established 1964) became Auchi Polytechnic in 1972. The

Commission, however, made no recommendations for the provision and training of teachers of technical education.

Yakubu (2002) observes that the level of development of any society depends on the level of technical skills acquisition its citizens acquired and applied to society. Nwangwu (2000) argues that industrialization breakthrough is solely accomplished through the ardent pursuit of technical skills acquisition. Odumosu (2005) avers that the sustainable development depends on a well articulated, functional science and technical skills acquisition programme that helps to create a better informed citizenry. Consequently, the role of technical education as a tool for national development should be conceived within the context of sustainable development.

There is hardly any economic activity that is not propelled by science and technology (Njoku, 2001), hence Esiobu (2005) notes that science and technology have long been recognized as the engine that drives economic development. Therefore, investment in technical skills acquisition, with its consequent application to socio-economic development, will certainly cause rapid transformation and advancement. This will facilitate the attainment of the Sustainable Development Goals (SDGs) and drive the goals of the National Economic Empowerment Development Strategy (NEEDS).

The significance of technical skills acquisition to national development cannot be overemphasized. Anya (2008) believes that better technical skills acquisition is essential for the economic development of any country. What is needed for any evolving nation is how the production of skilled manpower can be improved upon to make for rapid industrial and technological development. Edem (2005) predicts that in time to come, only people with appropriate and appreciable knowledge and skills in science and technology would be required in the labour market.

Within the context of overall national development, technical skills acquisition helps to produce technically-oriented and other related manpower for effective utilization, exploitation and conservation of a nation's natural, economic and human resources. In this way, technical skills acquisition assists in industrial and other developmental programmes of

a country. Nigerian economy is severely challenged by a dearth of employable hands. Nwangwu (2000) is of the opinion that a country with an ineffective batch of technicians and technologists is as poor in manpower as a country which lacks natural resources. Knowledge that is not put into practice becomes dormant and useless. Rodney (1973) argues that for a society to develop, it must possess the ability to tap its natural resources in order to cater for the material and socio-economic well being of its people.

Technical skills acquisition is one of the aspects of Nigerian education in which its curriculum was designed to enable the beneficiaries use both the hands and the brain while learning. However, this aspect did not develop quickly in Nigeria and that invariably affected the Nigerian industrial and technological development. According to Ejiogu (2000), the prevalent manpower situation in Nigeria today is generally characterized by large-scale unemployment for those without special skills or relevant training. Ejiogu further asserts that Every facet of the economy has been affected by lack of skilled technicians. The neglect of technical skills acquisition is socially and economically injurious because it robs the nation of the contributions the graduates would have made to national development.

Ukpong (2001) notes that the existence of a divergence between the world of learning and the world of work was caused by the existence of gaps between the educational system and the labour market. Ukpong further note that the dire consequences generated by this, namely the human resources wastage in its various forms and the emergence of a dangerous phenomenon of educated unemployed in the labour market needs urgent attention. Nigeria cannot develop without well-equipped technical and vocational institutions. In fact, lack of this is the missing link in Nigeria's development plans. Dike (2005) advises Nigeria to begin to make very serious investment in education and skills training as no nation can compete effectively in the emerging global market with poorly educated and unskilled workers.

Technical skills acquisition is essential for the development of all sectors of an economy, particularly those of developing economies such as Nigeria. The type of technical manpower required for economic development includes: low level (trade test, city and guild, and NBTE

certificates), middle level (NCE, ND and HND) and high level (B.Tech, B Sc, M Sc and Ph. D) manpower. Low level manpower is trained in technical colleges as artisans, while the high level manpower is trained in the universities as engineers. The polytechnics specialize in the training of technicians and technologists. Those who complete the National Diploma (ND) are employed as technicians, while the holders of Higher National Diploma (HND) are employed as technologists.

African Union's (2007) report also stressed the current vision of African countries in developing a new strategy to revitalize technical skills (TS) in Africa. The expectation is that it will promote skills acquisition through competency-based training. If this vision should materialize, it will require proficiency testing for employment in order to promote sustainable livelihoods and responsible citizenship. To achieve this goal of practical skills acquisition, the Ghana Industrial Skills Development Centre (GISDC) was established in 2002. This centre, working in close collaboration with the Association of Ghana Industries (AGI) and the Ghana Employers Association (GEA), was tasked to harness the financial and material resources required for achieving excellence in skills training. The technical skills acquired were supposed to raise individuals' job prospects and productivity. As a result, enterprises were expected to become more competitive and make a greater contribution to economic growth, on the condition that those trained in these institutions actually matched the requirements of the labour market.

UNESCO (2004) identified the two major objectives of technical skills as the urgent need to train the workforce for self-employment and the necessity to raise the productivity of the informal sector. UNESCO points out that lack of resources has led to cuts in the volume of training provided in public institutions. These cuts are a hindrance to pursuing the critical objectives of providing training and raising production. Considering the expensive nature of technical skills as a form of education, it is imperative that an expanded system with necessary and adequate facilities and equipment will lead to the effectiveness of the system. Competence refers to worker's ability to perform well on a job; it is the degree of success a worker attains when compared to the goal of an organization (Awhinana, 2008). Skills

acquisition measures how well a worker satisfies his employer in relation to established goals of the organization.

Any skills acquisition that promotes employability of graduates meets the requirement of the labour market while any skill that renders graduates unemployed is a mismatch. Emmudson, Fraizen and Narman (1988) did a tracer study in Botswana and found that 77% of the graduates of Botswana brigade secured employment after their training. Narman (1992), in another tracer study of 1,000 trainees from Moshi National Vocational Centre in Tanzania, found that many of the trainees secured employment easily in the labour market. This implied that both the Botswana and Tanzania Skills Acquisition Institutes produced relevant skilled manpower that satisfied the needs in their respective economies.

However, Ayeni and Oladipo (2007), in their study on training and employment of technical college graduates in Oyo State, found that only 441 out of 900 graduates, representing 49% secured employment. This is an indication that there are some deficiency or mismatch in the skills acquired. A similar finding was reported by Uche and Kpee (2007) that only 4-5% of graduates are employable. The employability or otherwise of graduates of technical skills acquisition institutions depends on the relevance of the skills acquired to the needs of the economy. Technical skills acquisition institutions in general and polytechnics in particular, must therefore ensure that the skills imparted and acquired in schools meet the needs of the economy.

The current emphasis on skills acquisition aims to equip students with definite and specific skills which could be utilized for either paid employment or self employment. Skills deficiency reduces the chances of securing employment as well as making it more difficult for graduates to confidently set up private businesses not to talk of becoming employers of labour. Relevant skills acquisition determines who gets the jobs as well as determining job creation for self and others. Consequently, there is the need by the government to plan and sustain industrial training machinery to back up the progress of technical skills acquisition institutions or polytechnics to match up training with effective skills acquisition that promotes employability.

Apparently, those with requisite education and skills are quickly absorbed into jobs, while those who possess neither sufficient academic nor technical skills live at subsistence level and often out of desperation and frustration, constitute a nuisance to the society. Skills development is important for harnessing a nation's natural resources and for promoting economic stability. The wealth of a society determines, to a large extent, the development of that society. Nigeria is endowed with mineral and agricultural resources. If these are to be properly harnessed and economically utilized, there is need for emphasis to be placed on the acquisition of skills for national development.

Skills and knowledge are inseparable entities; skill is a manifestation of acquired knowledge. It is a knowledge that is translated into practical activity. It may also be described as knowledge that is put into practical use once it is translated into activity (Okorie, 1993). The practical or activity components of skills relate to those areas of knowledge that pertain to the mode of doing. It enables the individual to acquire the know-how of a variety of skills that is related to a particular trade or occupation. Theory and practice must be fully integrated into the teaching-learning process for the purpose of effectiveness and worthwhile result. All teachings should help the learners acquire a blend of theory and practice skills in order to achieve the required objectives.

Resource Availability and Technical Skills Acquisition

All resources that are required for the enhancement of the teaching-learning process could be termed educational or teaching-learning resources. In this study, the specific teaching-learning resources for technical skills acquisition include: Lecture rooms, workshops, workshops personnel, instructional materials, ICT gargets, electricity/gas, consumables and instructional materials. Meaningful training and necessary skills acquisition cannot be possible without the availability of these basic teaching-learning resources to stimulate the curriculum contents and assist students realize the objectives of such programmes. Learning resources consist of all resources used to meet educational need or facilitates teaching-learning process. Osiyale (2000) defines resources to include environment of the school or

anything that stimulates students or aids teachers in the teaching-learning process. Osiyale's study related the influence of these institutional factors to the acquisition of technical skills.

Adeogun (2001) asserts a positive significant relationship between availability of equipment and skills acquisition. Many polytechnics now face the problem of inadequate and obsolete training equipment especially for science and technology programmes. They also lack current standard levels of precision and operate far below current industrial and training standard. Polytechnics can only operate satisfactorily with adequate infrastructure such as electricity, water, gas, communication, transportation and others.

Oni (1995) posits that educational resources are the sum total of the inputs that go into the educational system and are used directly or indirectly to facilitate, influence or encourage the transmission or acquisition of knowledge, competence, skills and know-how. Oni (1995) identified basic materials and equipment used in different science subjects to include cutlass, hoe, measuring tape, meter rule, volt meter, ammeter, washing machines, iron, refrigerator, electric cooker, electrified circular saw, screw drivers, pliers, socket and plugs, soldering iron, hammers, etc. Teaching equipment can be categorized into audio-such as radio and other media for hearing alone; visuals-such as instructional diagrams, maps, and model to reinforce the learning experience; and the audio-visual- such as television, video tape, projectors, slide, which combine the function of viewing and hearing into one device. Resources are essential inputs for the teaching-learning process in any educational system. According to Oni (1995), resources are the inputs that go to the educational system to be processed into the required output.

In this study such inputs include: staff and students, lecture rooms, library, workshop, equipment, ICT gargets, electricity and gas, machinery, transportation, consumables and instructional materials which promote the course of action in the conversion process. Physical resources must be adequately available before they can be utilized. It is essential to assess the resource availability in technical education institutions and their state or condition at a particular point in time because the quality of education and the skills acquired by the

students will be determined by the availability or otherwise of such important resources. It is a fact that resources are required for successful conversion-process into the required output in the polytechnics.

Hallak (1990) asserts that students who have access to necessary resources acquire better technical skills than those who did not have access to such resources. Adeogun (2001) and Ehiamentalor (2001) found that there was shortage of facilities in schools and this had negative implications on the quality of graduates. Baiyelo (2009) on the other hand, found that outdated curriculum contents and defunct facilities frustrate effective technical skills acquisition in Nigeria.

Below are some of the essential resources required for technical skills acquisition in the polytechnics:

Classroom: The classroom is a meeting ground for the peer group. Teaching and learning take place in the classroom and complementary acts that involve interpersonal processes also take place there. Schmuek and Schmulk (1971) observe that in some classrooms, the learning process is enhanced by peer relationship. Schmuek and Schmulk further assert that peers are especially influential in shaping the group processes of a classroom. Etuk (2005) found that the successful accomplishment of educational goals is hinged on the availability of classroom and other facilities which contribute to effective teaching-learning activities, thereby promoting skills acquisition. Spacious, equipped and well ventilated classrooms will enhance skills acquisition in the polytechnics. The classroom climate influences the behaviour of both teachers and students which in turn affects the teaching-learning environment either positively or negatively. Classroom situation should therefore be well managed in order to accomplish educational goals.

Library: Library is another important resource for skills acquisition. It is a repository designed to perform specified function in academic information gathering, both in books and other materials. Library is a media centre for books, journals and audio-visual aid materials. The intellectual and creative skills of students are sharpened as students access current

information from books and the Internet. There is need for adequate library resources for skills acquisition in polytechnics as this will help both students and teachers to form the habit of independent study and supply of updated academic information and research findings. According to Binitie-Cassidy (2011), libraries will make the benefactors develop the culture of carrying out researches, being a media centre of books, journals and other audio materials, libraries affords the users the access to current information relating to their respective disciplines.

Section 8 of National Policy on Education (Federal Republic of Nigeria, 2013) recognizes the importance of library as it states that library is one of the most important educational services and every State ministry needs to establish libraries in their educational institutions. Library is a vital living force in any educational system as it complements, implement and supplement educational programmes of the school. Library fosters the development of reading skills, literary taste and the dissemination of educational information. It helps to investigate and establish new ideas and also uncover new thoughts. Library should promote effective participation in school programmes, stimulate and guide students' reading habit, provide opportunities for helpful interest and effective teaching.

The Lagos State Library Board was established by Law No. 24 of 1980 as a parastatal of the Ministry of Education. Its functions include: serving as advisory body and consultant to school libraries, setting standard and policies for the establishment and maintenance of school library, implementation of government policies on libraries in the state, establishing and maintaining branches of the state library services at suitable centers and making the facilities of the State library services accessible to the public.

The library is the home of books and the store house of knowledge; text books are indispensable to the teaching efforts of the teachers. A well written book could impart knowledge like any typical teacher. The learning content or plan of the curriculum is brought alive in textbooks. Obayan (1980) asserts that textbooks are the most common sources of

information in the teaching-learning process and form a very important adjunct in the teaching process.

Equipment: Equipment and machines are needed for effective skills acquisition. Mills (1977) notes that skills acquisition requires the interaction of a person with equipment, machines and other appliances. Adeogun (2001) avers that many polytechnics are now facing the problem of inadequate and obsolete training equipment, especially for science and technology programmes. Many of the equipment are obsolete and spare parts are no longer available. The equipment also lack current levels of precision that are now the standard. A lot of the equipment are far below current industrial and training standards.

Teaching equipment can be categorized into audio-such as radio and other media for hearing alone; Visuals-such as instructional diagrams, maps, and model to reinforce the learning experience. The audio-visual, such as television, video tape, projectors, slide, which combines the function of viewing and hearing into one device. Audio-visual equipment produces exciting and valuable experience which takes a long period before being lost from memory. The use of audio-visual aids makes remembering very effective.

Information and Communication Technology (ICT): Information and Communication Technology is an imperative in skills acquisition. Olakulehin (2007) defines ICT as the range of technologies that are applied in the process of collecting, storing, editing, retrieving and transferring of information in various forms. Chen and Kee (2005) aver that ICTs are the back bone of the knowledge economy for promoting economic growth and sustainable development. ICT dominates educational activities in the developed countries, but faces serious challenges in the developing countries such as Nigeria. Such challenges include limited ICT infrastructure, poor internet connectivity, highly prohibitive cost, poor electrical energy and lack of maintenance and technical support staff (Olakulehin, 2007). ICT facilitates students' learning beyond the classroom activities. It helps to create autonomous and critical learning and ease the teaching-learning process. Sofolahan (2005) emphasizes

that the use of ICT will boost the quality of the teaching-learning process and also shift interpersonal relationship beyond the classroom.

In the 21st Century, ICT has overtaken the traditional way of teaching and learning which was purely teacher-based. This is because it was the teachers that established order, presented the ground rules and often spent up to 80% of his time talking to students and maintaining the position of primary director of activities within the classroom. This teaching-learning method is even worsening by the ever increasing population of learners with teacher-student ratio of about 1:100.

ICT has the answer to the problem of distance learning programme in Nigeria; it enhances teachers' presentation and enriches learning capabilities. It stimulates effective learning, improves feedback, sustains motivation, acts as teacher substitute, promotes suitable learning condition and bridges communication gaps between teachers and learners. The basic requirements for successful implementation of ICT include: computer hardware and software, network such as Local Area Network (LAN), Municipal Area Network (MAN), Wide Area Network (WAN), communication system, Video tapes production and multimedia projectors and access to the Internet. Successful implementation of ICT in Nigeria is hindered by lack of infrastructure, adequate and skilled personnel, inadequate curriculum content and inadequate funding.

Workshops: Workshops and Laboratories require and consume a lot of electricity, water and gas. In many, their locations place them outside public utilities. In these conditions performance can only be at the level of availability of these facilities. Workshops house most of the equipment discussed above. Equipped workshop is paramount to the success of technical education in general and skills acquisition in particular (Oni, 1995).

Workshop tools and equipment are very important to the successful implementation of any type of technical skills acquisition programme. Uzoagulu (1993) affirms that poor students' performance in technical skills acquisition in Nigeria was as a result of inadequate and non-functional training facilities. Mbata (1990) aver that some workshop tools and equipment

were sub-standard and therefore could not be easily maintained. Akpan (1983) posits that lack of equipment and workshop tools makes it impossible for the students to receive training that meets the standards for employment in industries or related organizations. Also Barky (2005) reiterates that the availability of instructional resources has a major influence on the selection of teaching methods and materials.

Without functional workshop tools and equipment, the technical teacher is handicapped and cannot go far in the use of demonstration method in his teaching. Technical skills acquisition has theory limit, if the teaching and learning exceed that limit, acquisition of skills is hampered and skills acquisition will become "theoretical education". It is not surprising therefore, that Ibehim (1994) laments that graduates of skills acquisition programmes were being rejected by industries because the graduates had the wrong kind of training in schools. The wrong kind of training implies that technical skills graduates were deficient in practicals; hence, they were unable to satisfy the industrial demands. The major problem therefore in developing technical skills programmes in Nigeria is the problem of inadequacy of and non-functional training facilities such as workshop tools and equipment.

In line with the foregoing, Uzoagulu (1993) reported that students were compelled to carry out practical exercise in groups due to lack of adequate tools and equipment. It was equally found that the few tools and equipment available were seldom functional. Uzoagulu further points out that inadequate budget is widely acknowledged as a factor militating against effective implementation of technical skills acquisition programmes in Nigeria, this has led to shortage of facilities and consumables with which to carry out effective practical work in the schools' workshops. Hence, technical skills acquisition institutions in Nigeria are bound to produce inadequately prepared graduates because of the inadequate workshops, tools, equipment and machines that are essential requirements for the smooth running of the programme.

Workshops must be well managed and safety must be well maintained in order to prevent unnecessary injuries and destructions. The Health and Safety at Work Act of 1974 places a high responsibility on all personnel or workmen in the workshop to ensure that they are in a

safe manner. Most of the accidents sustained in the workshops are caused by neglect or carelessness on the part of the workman. The Act directed that companies and institutions safety policy be established and a safety committee formed which should comprise members with a specialized knowledge of a particular risk such as service, operation and workshop managers. Such a committee will ensure that workshop's premises, operation and working environment are safe and healthy; set up administrative system to maintain safety and healthy conditions in the workshop; set up effective internal and external information system on matters relating to health and safety; and give adequate training in health and safety matters to the employees.

Employers must maintain safe equipment, safe working system, healthy working environment, welfare arrangement and adequate training for workers. The employees must also take reasonable care for their own safety and those of their co-workers and to cooperate with the employers or any other person on whom a statutory duty or requirement is imposed to ensure that the duty is performed. Causes of workshop accidents include: non-operative safety devices, using unsafe equipment, unguarded working condition, hazardous arrangement, unsafe lighting, careless operation, lack of operation skills or knowledge, etc. General safety precautions include: effective and proper working guards in workshops; skilled and authorized machine operators; neat, spacious, well ventilated, well arranged and lighted workshops; disciplined and alerted workmen; and availability of adequate first aid materials, etc.

Resource Adequacy and Technical Skills Acquisition

Resource adequacy is the extent to which the relevant available resources are adequate for technical skills acquisition in the polytechnics based on NBTE's specifications for accreditation. Umar and Ma'aji (2010) state that most of the polytechnics in Nigeria have been forced to perform below standard due to inadequate resources, poor management and neglect of maintenance culture. Umar and Ma'aji also found that the state of resources in polytechnics was very poor because there was hardly any concern on the part of government

and other stakeholders in the educational sector to replace obsolete and broken down resources needed for effective skills acquisition. The pathetic condition of the resources in the polytechnics needs to be reverted in order to meet the goals of technical education as stipulated in the National Policy on Education (Federal Republic of Nigeria, 2013).

Afeti (2007) opines that the quality of training in technical educational institutions in Nigeria is low with undue emphasis on theory and certification rather than on skills acquisition and proficiency testing. Inadequate training, obsolete training equipment, inadequate personnel and instructional materials are some of the factors that combine to reduce the effectiveness of training in meeting the required knowledge and skill objectives. High quality skills training requires qualified instructors, appropriate workshop equipment, adequate supply of training materials and practice by the learners.

Inadequate number and quality of relevant teaching staff is largely due to the fact that the sector does not produce its own teaching staff. It relies on the universities for the training and development of its staff. There is also no laid down system of industrial training for the teaching staff so that such staff can acquire industrial and practical experiences which they do not get sufficiently in the universities during their training programmes, but which they need, if they are to be effective and efficient trainers in the polytechnics. Employing staff, particularly academic staff of the right caliber is a serious problem confronting many polytechnics. The situation is worse in the case of institutions located in the rural areas, where it is more difficult to attract highly skilled professional manpower in fields such as accountancy, law, engineering, computer science, etc. Many such polytechnics have to rely on part-time lecturers drawn from neighbouring institutions located in the urban centers to teach some courses. This does not ensure commitment on the part of the staff or any measure of effective control over them.

Many polytechnics are now facing the problem of inadequate and obsolete training equipment, especially for science and technology programmes. Many of the equipment are obsolete and spare parts are no longer available. Such polytechnics also lack current levels of precision that are now the standard. A lot of the polytechnics are far below current industrial

and training standards. Polytechnics can operate satisfactorily only with adequate infrastructure such as electricity, water, gas, communication and transportation. Regular supply of electricity is another major resource that is essential in all facets of the economy to boost the much required technological advancement of the nation. Adebesin (2006) observes that there is no technological or vocational subject that can be offered at any level without regular electricity supply.

Another study on resource adequacy for teaching and learning of technical subjects in Lagos State by Adeogun and Osifila (2007) reports that 52% of the respondents agreed that resources were inadequate, while 48% responded otherwise. In another study on school plant and science students' academic performance in selected schools in Ijebu Ode, Adegbesan (2007) posits that only three schools out of 15 studied had adequate teaching-learning resources. Resources such as science laboratories, library, computer facilities, electricity and other equipment were grossly inadequate and this situation prevented necessary skills acquisition. Adequate library facility is a repository designed for information gathering for students; it is a media centre of books, journals and audio-visual aid materials that sharpens the intellectual and creative skills in students. The importance of science laboratories, computer facilities, electricity and other teaching-learning resources cannot be over emphasized.

Resource Utilization and Technical Skills Acquisition

Resource utilization is the frequency and the manner of application in which the available resources are put into judicious use. Nwankwo and Okunola (1988) define resource utilization as the frequency of use of resources so as to justify the purpose of providing them. They further explain that when available resources are not utilized, it does not benefit the students and their skills acquisition is negatively affected. Nneji (1998) remarks that available resources should be used so that the productivity of polytechnics can be enhanced.

Oni (1995) confirms that the frequency of utilization of educational resources has an inverse relationship with the unit cost, that is, when resources are underutilized, the unit cost will be high and vice versa. It becomes very necessary that the available resources be maximally

utilized. This can be achieved through a thorough review of the admission policy, including part-time admissions and the general programmes to be pursued in order to maximize the use of the available teaching-learning resources and to avoid unnecessary duplication while ensuring that they are adequate to the manpower needs in Nigeria. More avenues for practical experience should be created; this can be achieved through immediate employment of trainees in public and private industries in form of school-industry linkage or Students Industrial Work Experience Scheme (SIWES) using if and where necessary, the resources of the Industrial Training Fund (ITF). Teaching-learning resources must be used in accordance with the specific needs, goals and objectives of the system.

Resource utilization for efficient purpose is the yardstick for measuring school's performance (One of the ways to meet the need of education is determined by how resources are organized, mobilized, managed and utilized within the school and classrooms. It is imperative to optimally utilize the available resources in schools in order to achieve the stated goals and objectives. (Okereke, 2000), Fuller (2000) and Taylor (2000).

Oni (1995) states that optimal utilization of educational resources is when educational resources are used for as many purposes as possible. While underutilization occurs when available resources are in excess of the recommended figure, overutilization occurs when resources are not adequately provided for which leads to pressure on the use of a particular resource that is being used beyond their classic limit. Oni further asserts that educational institutions in Nigeria are noted for underutilization of resources as such resources are not used over weekends and during long vacation periods and suggested that school resources should be put to use during long vacations for part time programmes, conferences and workshops.

Okebukola (1998) suggests that for optimal utilization of resources, resource sharing and rationalization by institutions that are located in the same geographical zone should be observed in order to eliminate wastage. According to Hallak (1990), the effective utilization of educational resources is important because the educational system at all levels are

experiencing scarcity of resources and rising unit cost. There is need to effectively utilize available resources in order to ensure their optimal utilization and benefits. Acquiring technical skills through the utilization of resources is not an end in itself but rather a means to an end.

The ultimate aim of skills acquisition is that such acquired skills will be utilized in the workplace. Skills utilization is about ensuring the most effective application of skills in the workplace to maximize performance through the interplay of a number of key agents (e.g. employers, employees, learning providers and the State) and the use of a range of human resource management and working practices. Effective skills utilization seeks to match the use of skills to their demands or needs; however, available resources can only be utilized in polytechnics when there are qualified personnel to instruct students on their usage. Resource utilization in this study was measured based on the frequency of their use (daily, weekly, monthly and rarely) and on students' time table and checklist.

Curriculum Contents' Adequacy and Technical Skills Acquisition

Curriculum is like a roadmap which sets out the content of an education programme as well as specifying the topic, objective and activities to achieve the objectives. It must be dynamic and give clear guide of the extent to which a subject matter should be taught (Edem, 2005). Curriculum must include sufficient general education that students will acquire, the insights and intellectual processes to participate effectively and harmoniously in the community in which they live and work. The pertinent question on the nation's polytechnic curricula is how appropriate, relevant and up-to-date are they? For technical education sector especially, does the curriculum meet the needs of employers, industries and society at large in the age of convergence of information and communication technology? How well has it been able to impart the desired skills in the trainees? The answers to these questions are mainly in the negative. Ukoha (2001) asserts that some technical education curricula do not include sustainable practical work or experience that could make students gain professional competence, positive work attitude and good work ethics.

Some of the curricula had been in use for 15 years without review. The National Board for Technical Education (NBTE) saw this as a challenge and with the help of UNESCO, a project has been on since February 2001 to address the situation. The major component of the project is the commencement of the process for the review of over 130 curricula in the Board's portfolio for Polytechnics, Colleges of Technology and Monotechnics. Under the UNESCO-Nigeria project for the revitalization of technical education in Nigeria, the revision and updating of core engineering curricula used in the polytechnics have been completed. One major aim of the review is to make the curricula more practice-oriented in line with global trends and be more demand-driven and more responsive to the labour market.

Education is a dynamic instrument of change especially through technical skills acquisition, hence governments the world over invest massively in technical skills required for the modern age. For technical education curriculum content to be meaningful, the educational system must have been adequately equipped, and competent teachers who are resourceful and well motivated to carry out the job effectively be provided. (Obaro & Onosode, 1999). This view was corroborated by Alani (1988) who found that there was a positive return to investment in technical teacher education.

The curriculum content contains the total subjects offered by students at a given time; it embraces all that is offered in a programme of study or all that is required of a learner under the supervision of the school. A curriculum must include sufficient general education that students will acquire, the insights and intellectual processes to participate effectively and harmoniously in the community in which they live and work.

Other major components added to the curricula are the introduction of entrepreneurship education and incorporation of information and communication technology. The combined objectives of these two major components, is to achieve the production of technicians and technologists who, after a few years of further experience, would be able to access micro-credit facilities and set up their own small businesses that center around the skills and expertise the graduates have acquired, or who will be more readily employable since they would have possessed skills needed by employers. The curriculum should seek to foster in

students: the understanding of the operations in work place, demonstration of initiative, appreciation of the complexities in industries, application of enquiry, reasoning, critical thinking and problem solving skills, creativity, self-reliance, response to changes and opportunities.

Education is a dynamic process and for it to continue with the changing needs of the changing society, the curriculum of technical education will undergo innovation and change. Technical education curriculum innovation and change pose new demands on both the teachers and the learners. To this end, technical education curriculum for the future will have to address some pertinent issues in the National Policy on Education. The goals of technical education shall be to:

(a). provide trained manpower in the applied sciences, technology and business particularly at craft, advanced craft and technical level. It is in view of the goal stated that the curriculum of technical education for the sciences, technology and business at craft, advanced craft and technical level of the education system would command great attention. This is because the ability of the educational system to assist the learners to acquire the knowledge, skills, attitudes and values that will enable the graduates play effective roles in their societies and the world of tomorrow depends, to a great extent, on the approach of the technical educators and the society to the technical education curriculum. If effective trained manpower is to be provided and produced for the various levels mentioned, the selection of the technical education curriculum content and implementation for these levels must be performance-based, comprehensive and forward looking.

(b) provide the technical knowledge and vocational skills necessary for agricultural, commerce and economic development. In this regard, technical education curriculum must be properly planned and systematically tailored to provide the technical knowledge and vocational skills necessary for agricultural, commerce and economic development in a dynamic society. This view becomes pertinent because for education to be a dynamic process, it must continue to change with the changing needs of the society. In addition to helping individuals develop technical knowledge and vocational skills necessary for the

world of work, they should also be helped to relate skills to development, predisposition, personal construct and frame of reference, for these influence skills development. There should also be a way of encouraging them to put these skills into effective practice.

(c) give training and impart the necessary skills to individual who shall be self reliant economically. In pursuance of this goal, it is necessary to give the technical educators the environment that will enable them to give trainings and impart the necessary skills to individuals who shall be self reliant and to enable them set-up businesses of their own. This is because the objective of the technical education programme in any educational system is to assist the learners to acquire the knowledge, necessary skills, attitudes and values that will enable them play effective roles in their societies and the world of tomorrow and that depends, to a great extent, on the approach of the educators and the society to the designed technical education curriculum. If effective and competent individuals are to be produced for the various levels of education and to be self reliant, the selection of the technical education curriculum content for these levels must be performance-based, comprehensive and forward looking. The content should be such that should equip the technical educators to perform effectively for a particular level of education and also train the individuals to be self reliant.

In pursuance of the above goals:

The main features of the curriculum activities for technical colleges shall be structured in foundation and trade modules. The technical education curriculum for each trade shall consist of: General education, theory and related courses, workshop practice; industrial training/production work; small business management and entrepreneurial training.

Technical education is a purposeful learning activity undertaken on an on-going basis with the aim of improving knowledge, skills and competence. As a principle of educational integration, it can be seen as the provision of learning experiences in a wide range of options. It is a kind of education acquired without emphasis on white collar jobs. It is a kind of training given to individuals to be self-reliant and also to be employers of labour.

In the study, there was the need to evaluate the Technical education programme. Evaluation is the appraisal of the worth, status or value of a thing or action and the making of appropriate

decision. On the basis of such appraisal, there is great need for evaluation of technical education curriculum in a dynamic and ever changing society. Evaluation in technical education involves the collection of data concerning the technical education curriculum implementation, the teacher, facilities, methods and other related activities in the classroom during implementation.

The next level is the use of the data collected to assess the effectiveness or quality of technical education programme or the performance. Technical education programmes are established for some purposes mentioned earlier and it is the function of the programme evaluation to determine the extent to which the purposes of the programme are being achieved. Technical education programme is a plan of things that will be done or included in the development of technical education.

A training programme of technical education that can accommodate the changes in the society is the outcome of the evaluation that will determine those necessary elements that can be added or deleted from the technical education curriculum to meet and satisfy the objectives of the National Policy on Education. The main purpose of evaluation in technical education is to judge the worth, usefulness, effectiveness or value of the programme, be it on textbooks, students' performance or equipment. In a dynamic society, programme evaluation in technical education should perform one or more of the following functions:

(a). programmes are evaluated because we need improvement. Huge sum of money spent by governments on education to improve the skills of her citizens should produce good educational programme for technical education students; technical education programme that would serve the needs of the country and bring whatever changes are expected in the behaviour, character, skill level and social life of students who pass through the technical education institution.

(b). evaluation carried on technical education programme aids the planning of a new programme and deciding whether to expand, modify or discontinue with the existing programme. Planning for a higher and improved quality educational programme can emerge

as a result of evaluation of the old and current programmes. The planning of a technical education programme ensures that the programme will serve the needs of the society.

(c). effective decisions will be taken when authentic data collected are properly analyzed and utilized in planning technical education programme. It is necessary to evaluate a programme to assist decision makers to arrive at the best decision on how to implement technical education programme.

(d). accountability is the process of ensuring that all technical education expenditure is justified by the improved learning or other favourable outcomes that might result from the expenditure. Accountability will ensure alternative methods of procuring cheaper equipment, new building, and facilities and to compare such cost to benefits that can assist the management to actualize the set goals in technical education.

(e). evaluation can assist the institution to identify those personnel that will re-train to enable them fit into the technical education programme. It will ensure that technical education personnel are well trained and it is through evaluation that the management can identify those that are strong and weak in performance. It is under personnel improvement that lecturers are usually assisted by identifying their strong and weak points and be given encouragement to improve on their performance.

(f). technical education is the foundation upon which the skills of individual are built. Preparing individual for the world of work requires a good technical education foundation in a dynamic society. The strengthening of education is an essential foundation for a lasting solution to the training needs of a country. The training and retraining is necessary because there are millions of unemployed people who lack marketable skills and who have training needs which demand immediate action. Voluntary action by some groups – especially employers who, through formal or informal on-the job training, have traditionally been the chief source of training for workers in many occupations is essential.

Further needs in the field of training include experimentation with special techniques and programmes for training out-of-school youth and other special groups particularly people with little education in information communication technology (ICT), software developers in

mechanical trades; computer craft practice, electrical/electronics, trades, woodwork trades, construction trades, welding and fabrication, etc. The dynamics in training must be adapted to shifting technological demands. Both young people and matured workers must be made aware of the possibility that they may have repeated need for training and retraining often with great resultant opportunities for occupational progress and development in the society.

Summary of the Reviewed Literature

Technical education institutions are established to train and enable students acquire technical skills that will make them either readily employable in the labour market or be self-employed. However, many of the graduates of such institutions remain unemployed after graduation. Several authors cited in the reviewed literature expressed their opinions and findings concerning the quality of technologists trained in polytechnics and their expected contributions to the economic and industrial development in Nigeria. The consensus of many of the researchers indicates that there are certain resources such as lecture rooms, library, workshops, equipment, ICT, electricity, gas, consumables and instructional materials that will promote the acquisition of the required technical skills if their availability, adequacy and utilization are as required in the polytechnics.

In summary, resource availability, adequacy, utilization; and curriculum contents' adequacy determine the acquisition of the required technical skills or otherwise. For the expected technical skills acquisition to be achievable in the polytechnics, institutional factors must be available, adequate and utilized, coupled with adequate curriculum contents. There were certain gaps and omissions in the works reviewed that this particular study was meant to fill. This study focused on four major institutional factors (resource availability, adequacy, utilization; and curriculum contents' adequacy) which were different from the focus of previous studies conducted by other researchers. Many of the previous studies reviewed were conducted in the developed countries while this study focused on polytechnics in Nigeria, a developing country. Other similar studies conducted in Nigeria did not cover the same geo-political zone or the same time range, neither were the same variables studied. The

geographical scope of this study was South-West Nigeria. The gaps the study filled therefore included the use of different variables, geographical location and time range.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter presents the methodology adopted for the study. It focuses on the research design, population of the study, sample and sampling techniques, research instruments, validity and reliability of the instruments, procedure for data collection, and methods of data analysis.

Research Design

The descriptive survey research design was used for this study. This design was adopted to report the prevailing state of the polytechnics and to suggest necessary improvement for technical skills acquisition in the polytechnics.

Population of the Study

The population for the study comprised 5,960 HND II full-time students of Civil, Mechanical, Electrical/Electronics and Computer Engineering in the school of Engineering Technology in the nine selected Polytechnics in South-West Nigeria. The selection of Engineering Technology was based on its being one of the technology-oriented programmes stratified by NBTE in polytechnics and because their programmes had been accredited. The study also focused on HND full-time students because, being at the terminal stage of polytechnic education with five years experience, were in a better position than National Diploma students to competently assess the relevance of polytechnic education to skills acquisition.

Sample and Sampling Techniques

During data collection, there were 105 polytechnics in the six geo-political zones in Nigeria, 25 of them were located in South-West geo- political zone out of which eight were owned by the federal government, seven owned by the state government and 10 owned by private organizations and individuals. The polytechnics were stratified into federal, state and private ownership, while the stratified random sampling technique was used to select three polytechnics each under the federal, state and private ownership. Ten percent of the population which was 596 from the population of 5,960 HND II full-time students in the

school of Engineering Technology in the selected polytechnics formed the sample. The choice of 10% of the population in each of the selected polytechnic was to maintain a non biased sample. Table 1 shows the breakdown of the sample.

Table 1: Selected Polytechnics by Ownership, Location, Population and the Participants in the study

S/N	Name of Polytechnic	Ownership	Location	Population	Sample
1.	Yaba College of Technology	Federal	Yaba, Lagos	750	75
2.	Federal Polytechnic, Ilaro	Federal	Ilaro, Ogun	690	69
3.	Federal Polytechnic, Ede	Federal	Ede, Osun	640	64
4.	The Polytechnic, Ibadan	State	Ibadan, Oyo	660	66
5.	Lagos State Polytechnic,	State	Ikorodu, Lagos	810	81
6.	Moshood Abiola Polytechnic	State	Abeokuta, Ogun	700	70
7.	Lagos City Polytechnic	Private	Ikeja, Lagos	620	62
8.	Allover Polytechnic, Ota	Private	Ota, Ogun	520	52
9.	The Polytechnic, Ile-Ife	Private	Ile-Ife, Osun	579	57
Total				**5,960**	**596**

Research Instruments

The research instruments used were "Institutional Factors and Technical Skills Acquisition Questionnaire (IFTSAQ)" and "Polytechnic Resource Profile Checklist (PRPC)" of Resource Availability, Adequacy, Utilization; and Curriculum Contents which were developed by the researcher. The questionnaire contained Sections A-F: Section A contained four items on demographic background of the participants; Section B contained 12 items on Curriculum

Content Adequacy (CCA), Section C contained 10 items on Resource Availability Assessment (RAA), Section D contained 10 items on Resource Adequacy Assessment (RAA), Section E contained 10 items on Resource Utilization Assessment (RUA), Section F contained 16 items on Technical Skills Acquisition Assessment (TSAA). On the checklist, resource availability, adequacy, utilization; and curriculum contents were based on NBTE's specifications for accreditation (NBTE, 2007a).

Validity of the Instrument

In order to ensure the content validity of the instruments, five lecturers in the Department of Educational Management including the project supervisors made their inputs. The lecturers scrutinized, corrected and approved the instruments before the final copies were tested for reliability. This was to ensure that the instruments measured exactly what they were meant to measure.

Reliability of the Instrument

A pilot study was carried out by the researcher at Osun State Polytechnic, Iree before the main field work was conducted to determine the instrument's consistency in measuring what it was meant to measure. The test- retest method was used. The questionnaire for the pilot study was administered on 100 selected students who were not part of the main study, 25 each from Departments of Civil, Mechanical, Electrical/Electronics and Computer Engineering. The same questionnaire was re-administered to the same students two weeks later. The two sets of scores obtained were correlated using Pearson Product Moment Correlation method to determine the instrument's reliability. The correlation coefficients, obtained were 0.85 for resource availability, 0.88 for resource adequacy, 0.89 for resource utilization and 0.80 for curriculum contents. The overall average was 0.86 which indicated that the instrument was reliable. The profile checklist was not tested for reliability because it was used to obtain data that could not be changed.

Procedure for Data Collection

Four lecturers, each from Departments of Mechanical, Civil, Electrical/Electronics and Computer Engineering in the nine selected polytechnics assisted to guide and supervise the participants in the completion of the questionnaire which was done before the commencement of their lectures. The questionnaire was retrieved immediately it was completed and personally vetted by the researcher to ensure its usefulness for the study. This method of data collection ensured 100% response rate. The profile checklist of resource availability, adequacy, utilization; and curriculum contents was personally completed by the researcher based on NBTE's specifications for accreditation in the polytechnics.

Methods of Data Analysis

Descriptive and inferential statistical tools were used for data analysis; percentage was used to analyze the bio-data of the participants and to answer the research questions 1 to 4 while regression analysis was used to answer research questions 5 and 6. Inferential statistics were used to test the null Hypotheses at .05 level of significance. Pearson Product Moment Correlation (PPMC) was used to test Hypotheses 1, 2, 3 and 4. One-way Analysis of Variance (ANOVA) was used to test Hypotheses 5 and 6. Independent t-test was used to test Hypothesis 7.

The responses of the participants were used to answer the research questions and to test the hypotheses. The Likert's type rating scale method of scoring instrument was used for data scoring as follows:

Scale	Score
Strongly Agree/Highly Adequate/Daily Utilized	4
Agree/More Adequate/Weekly Utilized	3
Disagree/Least Adequate/Monthly Utilized	2
Strongly Disagree/Not Adequate/Rarely Utilized	1

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF FINDINGS

The chapter presents the demographic characteristics of the participants, answers to research questions, results of tested research hypotheses, summary of findings and the discussion of the findings.

Demographic Characteristics of the Participants.

The demographic characteristics of the participants are shown on table 2.

Table 2: Demographic Characteristics of the Participants in the Study

Item	Frequency (N)	Percentage
Age (Years)		
15-19	52	8.7
20-24	261	43.8
25-29	193	32.4
30-34	90	15.1
Gender		
Male	381	63.9
Female	215	36.1
Institutional Ownership		

Federal	208	34.9
State	217	36.4
Private	171	28.7
Programme		
Civil Engineering	163	27.3
Mechanical Engineering	125	21.0
Computer Engineering	167	28.0
Electrical/Elect Engineering	141	23.7
Total	**596**	**100.0**

Table 2 shows that out of 596 participants, 52 (8.7%) were in age bracket 15-19, 261 (43.8%) in 20-24, 193 (32.4%) in 25-29, while 90 (15.1%) were in age bracket 30-34. With respect to gender, 381, (63.9%) were male, while 215. (36.1%) were female. Out of 596 participants, 208 (34.9%) were selected from federal polytechnics, 217 (36.4%) from state polytechnics, while 171 (28.7%) were chosen from private polytechnics. Of 596 participants, 163 (27.3%) were selected from Civil Engineering, 125 (21.0%) from Mechanical Engineering, 167 (28.0%) from Computer Engineering and 141 (23.7%) from Electrical/Electronic Engineering.

Answers to Research Questions

Research Question 1: What is the level of resource availability for technical skills acquisition in South-West Nigerian Polytechnics?

Table 3 presents the answer to research question 1.

Table 3: Resource Availability and Technical Skills Acquisition in South-West Nigerian Polytechnics.

Items	High		Low	
	Freq.	%	Freq.	%
How available are machinery/transportation in polytechnics?	191	32.0	405	68.0
How available are library facilities in your polytechnic?	544	91.3	52	8.7
What is the level of availability of equipment/tools?	291	48.8	305	51.2
How available is ICTs (Computers, Laptops, Projector,)?	404	67.7	192	32.3
How available are the lecture rooms in your polytechnic?	466	78.2	130	21.8
What is the level of availability of workshop staff?	414	69.4	182	30.6
To what extent is electricity/gas available in polytechnics?	74	12.4	522	87.6
What is the level of workshop availability in polytechnics?	448	75.2	148	24.8
To what extent are the consumables available in polytechnics?	391	65.6	205	34.4
To what extent are other instructional materials (Books,				

graphs, maps, models) available in polytechnics?	448	75.2	148	24.8
Overall Average	**367**	**61.7**	**229**	**38.3**

Table 3 shows that only library, lecture rooms, workshop and instructional materials measured up to the required level of resource availability (70 % and above as specified by NBTE). The overall average resource availability for technical skills acquisition was 61.7%. The result obtained from the checklist for overall average resource availability was 56.8%. This implies that the resource availability was low, being less than 70%, this could have negative effect on technical skills acquisition in the polytechnics.

Research Question 2: To what extent are the resources adequate for technical skills acquisition in the Polytechnics?

Table 4 presents the answer to research question 2.

Table 4: Resource Adequacy and Technical Skills Acquisition in the Polytechnics.

Items	Agreed		Disagreed	
	Freq.	%	Freq.	%
There is adequate machinery/transportation in my department	181	30.4	415	69.6
Library resources are adequate in my department	454	76.2	142	23.8
We have adequate equipment/tools in my department	262	44.0	334	56.0
ICTs (Computers, Laptops, Projectors, etc) are adequate in my department	396	66.5	200	33.5
My department has adequate lecture rooms	472	79.2	124	21.8
There are adequate workshops personnel/instructors in my department	428	71.8	168	28.2
Electricity/Gas is adequate in my department	74	12.5	522	87.5
There are adequate workshops in my department	80	13.4	526	86.6
There are adequate consumables (Chemicals, water, markers, chalks) in my department	367	61.5	229	38.5
Other instructional materials (Books, graphs, maps, models) are adequate in my department	438	73.5	158	26.5
Overall Average	**315**	**52.8**	**281**	**47.2**

Based on NBTE's specifications for accreditation, table 4 shows that only library, lecture rooms, workshop personnel and instructional materials were adequate for technical skills acquisition as they scored more than 70%. The overall average of resource adequacy for technical skills acquisition was 52.8%. A similar result was obtained from the checklist with the overall average resource adequacy of 51.2%. This implies that there was inadequate resource for technical skills acquisition in the polytechnics. In another word, the resource adequacy was low and that could hamper technical skills acquisition.

Research Question 3: How frequent are the resources utilized for technical skills acquisition in the polytechnics?

The answer to research question 3 is presented in table 5.

Table 5: Resource Utilization and Technical Skills Acquisition in the Polytechnics

Items	High		Low	
	Freq.	%	Freq.	%
What is the level of machinery/transportation utilization?	246	41.2	350	58.8
How utilized is the library in your polytechnic?	542	90.9	54	9.1
To what extent are equipment/tools utilized in polytechnics?	309	51.9	287	48.1
How utilized is ICTs (Computers, Laptops, Projectors,)?	408	68.4	188	31.6
To what extent are lecture rooms utilized in polytechnics?	532	89.2	64	10.8
How utilized are workshops staff in your polytechnic?	433	72.6	163	27.4
How utilized is electricity/gas in your polytechnic?	110	18.4	486	81.6
To what extent are the workshops utilized in polytechnics?	118	19.8	478	80.2
How utilized are the consumables in polytechnics?	403	67.6	193	32.4
How utilized are the other instructional materials in polytechnics?	462	77.5	134	22.5
Overall Average	**356**	**59.8**	**240**	**40.2**

Based on the frequency of usage, table 5 shows that only library, lecture rooms, workshop staff and instructional materials had the specified level of resource utilization of 70% and above for technical skills acquisition, their utilization was therefore rated high while the utilization of other resources were rated low. The overall average of resource utilization for technical skills acquisition was 59.8%., this implies low resource utilization. The frequency

of usage ranged from daily, indicating frequent utilization to weekly, indicating often utilization to monthly, or seldom utilization and rare utilization. Frequent and often utilization was scored high while monthly and rare utilization was scored low.

Optimal utilization of resources in the polytechnics can be obtained if the resources are used for as many purposes as possible. Since education resources are low in the polytechnics, it is expected that there would be overutilization of resources resulting to pressure on the use of resources beyond the classic limit.

Research Question 4: How adequate are the curriculum contents for technical skills acquisition in the polytechnics?

Table 6 shows the answer to research question 4.

Table 6: Curriculum Contents' Adequacy and Technical Skills Acquisition in Polytechnics

Items	Agreed		Disagreed	
	Freq.	**%**	**Freq.**	**%**
NBTE's specifications adequately covered in the Curriculum	510	95.6	26	4.4

The Curriculum is learner- centered	550	92.3	46	7.7
The Curriculum is competence-based	518	86.9	78	13.1
The Curriculum is relevant to skills acquisition	538	90.3	58	9.7
The Curriculum is up-to-date for skills acquisition	217	36.4	379	63.6
The Curriculum meets the needs of employers	206	34.6	390	65.4
The Curriculum guarantees acquisition of desired skills	489	82.0	107	18.0
The Curriculum promotes self-reliance/ employment	508	85.2	88	14.8
The curriculum is dynamic and forward looking	292	49.0	304	51.0
The Curriculum fosters school-industry linkage	435	73.0	161	27.0
The curriculum promotes workplace operation	226	38.0	370	62.0
The curriculum fosters practical skills	488	81.8	108	18.2
Overall Average	**416**	**77.3**	**180**	**23.7**

The researcher used UNESCO's specified composition of seven components index for measuring adequacy of curriculum content of programmes in polytechnics which range from composition 1-3 (1-50%) as inadequate, 4-5 (51-70%) as adequate, and 6 and above (71-100%) as highly adequate. Table 6 shows that only items for the up-to-date curriculum content for skills acquisition, meeting the needs of employers, curriculum dynamism, forward looking curriculum and understanding of work place operation were rated as inadequate. All other items were rated as highly adequate and the overall average was 77.3% curriculum adequacy for technical skills acquisition which implies highly adequacy of resources. The checklist's score was 74.5% for curriculum content adequacy which also implies highly adequacy of resources. If resources are not available when needed for

technical skills acquisition, it might hinder the impartation of technical skills and could prevent the production of competent technologist by the polytechnics.

Research Question 5: To what extent do resource availability, adequacy and utilization; and curriculum contents jointly contribute to technical skills acquisition in the polytechnics?

The answer to research question 5 is presented on tables 7 and 8.

Table 7: Joint contributions of Resource Availability, Adequacy and Utilization; and Curriculum contents to Technical Skills Acquisition in the Polytechnics

Model	R	R Square	Adjusted R Square	Std. Error of the estimate	Durbin-Watson
1	.197	.039	.032	5.30293	1.840

Table 7 shows that the four explanatory variables (Resource availability, adequacy and utilization; and curriculum contents) contributed 3.2% to the variance in technical skills acquisition in selected polytechnics in South-West, Nigeria. By implication, the remaining 96.8% was due to residual and other variables not included in this study.

To determine whether the Adjusted R Square value of .032 obtained is significant or not, the Analysis of Variance (ANOVA) was run as shown in table 8.

Table 8: ANOVA of the Regression Analysis

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	671.576	4	167.894	5.970	.000
Residual	16619.530	591	28.121		
Total	**17291.106**	**595**			

Table 8 shows that **F** value of 5.970 was significant at **p** =.000. This means that the contribution of the selected factors was not due to chance. Rather, these factors were

determinants of technical skills acquisition in the selected polytechnics in South-West, Nigeria.

Research Question 6: What are the relative contributions of resource availability, adequacy and utilization; and curriculum contents to technical skills acquisition in the polytechnics?

Table 9 presents the answer to the research question 6.

Table 9: Relative Contributions of Resource Availability, Adequacy, Utilization and Curriculum Contents to Technical Skills Acquisition in the Polytechnics

	Unstandardized coefficients		Standardized coefficients		
Model	**B**	**Std. Error**	**β**	**t**	**Sig**
1 (Constant)	30.954	1.914		16.175	.000
Curriculum Contents	.141	.057	.113	2.457	.014
Resource Availability	.055	.083	.054	.532	.013
Resource Adequacy	-.208	.079	.188	-2.642	.008
Resource Utilization	.212	.079	.178	2.683	.007

Table 9 shows that the selected factors had varied contributions to technical skills acquisition as indicated by the standardized Beta values (**β).** The four variables were found to contribute differently to technical skills acquisition in polytechnics. Specifically, resource adequacy contributed the highest (=.188), followed by resource utilization (**β**=.178**)**, curriculum content (**β**=.133) and resource availability (**β** =.054). The table further shows that the contributions of all the explanatory variables are significant.

Table10: Resource Availability, Adequacy and Utilization; and Curriculum Contents Adequacy in the Polytechnics (Checklist)

Resource	Resource Availability		Resource Adequacy		Resource Utilization		Curriculum content Adequacy	
	%	Remark	%	Remark	%	Remark	%	Remark
Machine/Transport	32	Low	30	Low	41	Low		
Library	91	High	76	High	91	High		
Equipment/Tools	49	Low	44	Low	52	Low		
ICTs	70	High	70	High	71	High		
Lecture rooms	78	High	79	High	89	High		
Workshop personnel	70	High	72	High	73	High		
Electricity	12	Low	13	Low	18	Low		
Workshop/Laboratory	20	Low	13	Low	75	High		
Consumables	71	High	71	High	70	High		
Instructional materials	75	High	74	High	78	High		

NBTE's specification	96	Highly Adequate
Learners-centred	92	Highly Adequate
Competence- based	87	Highly Adequate
Skills acquisition-oriented	90	Highly Adequate
Employability	35	Inadequate
Curriculum Dynamism	49	Inadequate
School-Industry linkage	73	Highly Adequate

Overall Average 56.8 Low 51.2 Low 75.8 Highly Adequate 74.5 Highly Adequate

Table 10 shows a combination of the polytechnics resource profile checklist of resource availability, adequacy and utilization; and curriculum content adequacy for technical skills acquisition in the polytechnics based on NBTE's minimum accreditation standard for facilities and the criteria for approval of programmes in technical and vocational institutions (NBTE, 2007b). Items on resource availability, adequacy and utilization that scored 70% and above were rated high, while items that scored less than 70% were rated low. The percentage of the resources available to the required resources was calculated to determine whether it is high or low. Scores above 70% were rated highly adequate, while scores below 70% were rated low. Resources used daily and weekly were rated high, while those used monthly and rarely were rated low. The profile checklist of curriculum content was based on UNESCO's specified composition of seven components index for measuring the adequacy of curriculum content of polytechnics' programmes. From the overall average, only resource utilization scored high and curriculum content adequacy scored highly adequate. Resource availability and adequacy scored low.

Testing of Research Hypotheses

H01: There is no significant relationship between the level of resource availability and technical skills acquisition in South-West Nigerian Polytechnics.

The result of the hypothesis 1 is presented on Table 11.

Table 11: Relationship between Resource Availability and Technical Skills Acquisition in South West Nigerian Polytechnics

Variables	**Mean**	**Std. Deviation**	**N**	**r**	**p**	**Decision**
Technical Skills	37.65	5.39				Rejected
			596	.096	.019	
Resource Availability	26.06	5.10				

Significant at .05 level

Table 11 shows **r** =.096 and this implies a weak but positive relationship between resource availability and technical skills acquisition, while **p** =.019 indicates a significant relationship

between the level of resource availability and technical acquisition. Hence, the null hypothesis was rejected.

H02: The resource adequacy is not significantly related to technical skills acquisition in the polytechnics.

Table 12 presents the result of the tested Hypothesis 2.

Table 12: Relationship between Resource Adequacy and Technical Skills Acquisition in the polytechnics

Variables	Mean	Std. Deviation	N	r	p	Remark	Decision
Technical Skills	37.6527	5.39080					Accepted
			596	.028	.502	Not Sig	
Resource Adequacy	25.7282	4.86109					

Significant at .05 level.

In table 12, **r** = .028 indicates a weak and positive relationship between resource adequacy and technical skills acquisition, while **p**=.502 shows that there was no significant relationship between resource adequacy and technical skills acquisition. Thus, the null hypothesis was accepted.

H03: The frequency of resource utilization has no significant relationship with technical skills acquisition in the polytechnics.

The result of the tested Hypothesis 3 is presented on Table 13.

Table 13: Relationship between Resource Utilization and Technical Skills Acquisition in the Polytechnics

Variables	Mean	Std. Deviation	N	r	p	Remark	Decision
Technical Skills	37.6527	5.39080					Rejected
			596	.129	.002	Sig	
Resource Utilization	26.8926	4.54245					

Significant at .05 level

Table 13 shows that **r**= .129 which indicates a weak and positive relationship between resource utilization and technical skills acquisition, while **p**=.002 shows there was a significant relationship between resource utilization and technical skills acquisition. The null hypothesis was therefore rejected.

H04: There is no significant relationship between curriculum contents' adequacy and technical skills acquisition in the polytechnics.

The result of the tested hypothesis 4 is presented on Table 14.

Table 14: Relationship between Curriculum Contents' Adequacy and Technical Skills Acquisition

Variables	Mean	Std. Deviation	N	r	p	Remark	Decision
Technical Skills	37.6527	5.39080					Rejected
			596	.139	.001	Sig	
Curriculum Content	34.6762	4.34915					

Significant at .05 level

Table 14 shows that **r** = .139 which implies a weak and positive relationship between curriculum content adequacy and technical skills acquisition, while **p** =.001 shows that there

was a significant relationship between curriculum content adequacy and technical skills acquisition. The null hypothesis was therefore rejected.

H05: There is no significant difference in technical skills acquisition based on students' programmes in the polytechnics.

Table 15 presents the result of the tested hypothesis 5.

Table 15: Differences in Technical Skills Acquisition based on Students' Programmes

Variables	Sum of Squares	Df	Mean Square	F	Sig
Between Groups	264.857	3	88.286	3.070	.072
Within Groups	17026.248	592	28.761		
Total	**17291.105**				

Significant at .05 level

Table 15 the mean difference F=3.070 at .072 which indicates that there was no significant difference in technical skills acquisition based on students' programmes. The null hypothesis was therefore accepted.

H06: Technical skills acquisition is not significantly different in the polytechnics based on ownership.

The result of the tested hypothesis 6 is presented on table 16.

Table 16: Difference in Technical Skills Acquisition Based on Ownership

Variable	Sum of Squares	Df	Mean Square	F	Sig
Between Groups	80.988	2	40.494	1.395	.249
Within Groups	17210.117	593	29.494		

Total	**17291.105**	**595**

Significant at .05 level

Table 16 shows the mean difference **F**=1.395 at .249 which indicate that there was no significant difference in technical skills acquisition based on ownership. The null hypothesis was therefore accepted.

H07**:** There is no significant difference in technical skills acquisition between male and female students in the polytechnics.

Table 17 shows the result of the tested hypothesis 7.

Table 17: Difference in Technical Skills Acquisition between male and female students

Gender	**N**	**Mean**	**Std. Deviation**	**Df**	**t**	**P**	**Remark**	**Decision**
Male	381	37.4462	5. 69352					Rejected
				594	-1.245	.017	Sig.	
Female	215	38.0186	4.79872					

Significant at .05 level.

An independent t-test was run in order to determine if any difference existed in the mean scores of male and female students on technical skills acquisition in the polytechnics. From Table 17, based on the participants' responses to the administered questionnaire, there was a statistically significant difference in technical skills acquisition in the polytechnics between male (N=381; Mean=37,446; SD=5.694; Df=594) and female (N=215; Mean=38.019; SD=4.799; Df=594) students. Since t= -1.245; p<.05. The t-value shows a significant difference in technical skills acquisition based on gender; therefore the null hypothesis was rejected.

Discussion of Findings

Below is the discussion of the findings of the study.

Research Question 1:

What is the level of resource availability for technical skills acquisition in South-West Nigerian polytechnics?

Resource Availability and Technical Skills Acquisition

The answer to Research Question 1 showed that library, lecture rooms, workshop and instructional materials measured up to the required level of resource availability (70 % and above as specified by NBTE). The overall average resource availability for technical skills acquisition was 61.7%. The result obtained from the checklist for overall average resource availability was 56.8%. The result of the hypothesis 1 tested showed **p** value of .019 at .05 significant level. This indicated a significant relationship between the level of resource availability and technical acquisition.

Since the result showed that significant relationship existed between resource availability and technical skills acquisition in South-West Nigerian polytechnics (**r**=.096; **P**<0.05), it is an indication that the more available resources are in the polytechnics, the more the technical skills will be acquired by the graduates during their training. This indicated the need for the provision of necessary resources in the South-West Nigerian polytechnics. Resources such as library, lecture rooms, workshops and instructional materials that measured up to the required level of 70% and above will have to be sustained and both the average resource availability of 61.7% and the result of the checklist for resource availability of 56.8% can still be improved upon. Resources that have low level of availability such as equipment, ICT, electricity/gas and the consumables deserve urgent attention in order to foster technical skills acquisition in the polytechnics.

The finding was supported by the results of study conducted by Adeogun (2001) which stated that facilities' availability was essential for the attainment of technical education goals with a focus on technical skills acquisition. The findings also agreed with that of Owolabi (2005) who asserted that facilities such as school building, workshops, libraries, classrooms and instructional materials were major determinants of academic achievement and skills

acquisition in the school system. Akanbi (1984), Adeogun (2001) and Onyene and Fabiyi (2007) emphasized the importance of availability of facilities such as infrastructure, equipment, workshops and laboratory materials for technical skills acquisition.

Research Question 2: To what extent are the resources adequate for technical; skills acquisition in the polytechnics?

Resource Adequacy and Technical Skills Acquisition

Based on NBTE's specifications for accreditation, answer to research question 2 showed that library, lecture rooms, workshop personnel and instructional materials were adequate for technical skills acquisition as they scored more than 70%. The overall average of resource adequacy for technical skills acquisition was 52.8%. A similar result was obtained from the checklist with the overall average resource adequacy of 51.2%. The result of the tested research hypothesis 2 showed **r** = .028 which indicated a weak but positive relationship between resource adequacy and technical skills acquisition, while **p**=.502 showed that there was no significant relationship between resource adequacy and technical skills acquisition. This result was not in line with the expectation of the researcher since it was expected that the more adequate resources are, the higher should be the level of technical skills acquired by polytechnic graduates. However, if adequate resources are not made available at the time they were required, it would likely reduce the level of technical skills acquisition of the students.

Based on NBTE's specifications for accreditation, only library, lecture rooms, workshop personnel and instructional materials were adequate for technical skills acquisition with an average resource adequacy of 52.8%. Result obtained from the checklist showed overall average resource adequacy of 51.2%. This indicates the need for provision of adequate resources for technical skills acquisition in the polytechnics.

Hallak (1990) and Ayua (2006) emphasized the influence of facilities' adequacy for the achievement of technical skills acquisition. Hallak & Ayua asserted that facilities' adequacy could not be taken for granted if technical skills were to be acquired. The difference between

the findings of this study on the relationship between resource adequacy and technical skills acquisition and the findings of other researchers could be due to residual error and other variables not considered in this study.

Research Question 3: How frequent are the resources utilized for technical skills acquisition in the polytechnics?

Resource Utilization and Technical Skills Acquisition

Based on the frequency of usage, the answer to research question 3 showed that library, lecture rooms, workshop staff and instructional materials had the specified level of resource utilization of 70% and above for technical skills acquisition. The overall average of resource utilization for technical skills acquisition was 59.8%. The frequency of usage ranged from daily to weekly to monthly and rare utilization. Daily and weekly utilization was scored high, while monthly and rare utilization was scored low. The finding from the tested research hypothesis 3 showed the **r** value of .129 which indicated a weak but positive relationship between resource utilization and technical skills acquisition. The **p** value of .002 showed that there was a significant relationship between resource utilization and technical skills acquisition.

According to the study, there was a significant relationship between resource utilization and technical skills acquisition in the polytechnics (**r**=.129; **P**<.05). The more effective resources are utilized, the higher the level of technical skills acquisition expected. Resources need to be put to maximum use in order to avoid under utilization and wastage, especially the technical skills equipment that can depreciate if left unused for a long time.

This finding supported the study of Nwankwo and Okunola (1988) who found a positive relationship between facilities' utilization and technical skills acquisition. Nwankwo and Okunola define resource utilization as the frequency of use of resources so as to justify the purpose of providing them. Nwankwo & Okunola further explain that when available resources are not utilized, it does not benefit the students and students' skills acquisition is

negatively affected. Nneji (1998) remarked that available resources should be used so that the productivity of polytechnics can be enhanced. Oni (1995) observed that the frequency of utilization of educational resources has an inverse relationship with the unit cost, that is, when resources are underutilized, the unit cost will be high and vice versa. It becomes very necessary that the available resources be maximally utilized.

Research Question 4: How adequate are the curriculum contents for technical skills acquisition in the polytechnics?

Curriculum Contents' adequacy and Technical Skills Acquisition

The answer to Research Question 4 showed that the components consisting of up- to- date curriculum content for skills acquisition, meeting the needs of employers, curriculum dynamism, forward looking curriculum and understanding of work place operation were rated as inadequate. All other items were rated as highly adequate and the overall average was 77.3% curriculum adequacy for technical skills acquisition. The rating was based on UNESCO's specified composition of seven components index for measuring adequacy of curriculum content of programmes in polytechnics which ranges from composition 1-3 (1-50%). as inadequate, 4-5 (51-70%) as adequate, and 6 and above (71-100%) as highly adequate. The checklist's score was 74.5% for curriculum content adequacy. Finding from the tested hypothesis 4 showed that **r** = .139 **p**=.001 which implies a weak but positive relationship between curriculum content adequacy and technical skills acquisition. A significant relationship was found between curriculum contents adequacy and technical skills acquisition in this study (**r**=.139; **P**<.05). This is an indication that curriculum content is an important factor for technical skills acquisition in the polytechnics.

Curriculum content is a roadmap that set out the content of the educational programme that specifies the topics, objectives and the activities required to achieve the objectives, it must be related to the needs of the economy. It must be dynamic and give clear guide of the extent to which a subject matter should be taught (Edem, 2005). Curriculum must include sufficient general education that students will acquire, the insights and intellectual processes to

participate effectively and harmoniously in the community in which the graduates live and work. The pertinent question on the nation's polytechnic curricula is how appropriate, relevant and up-to-date are the curricula? For technical education sector especially, does the curriculum meet the needs of employers, industries and society at large in the age of convergence of information and communication technology? How well has it been able to impart the desired skills in the trainees? The answers to these questions are mainly in the negative. Ukoha (2001) asserted that some technical education curricula do not include sustainable practical work or experience that could make students gain professional competence, positive work attitude and good work ethics. The polytechnic curricula must be comprehensive and functional in order to meet the needs of the Nigerian economy.

The finding of this study corroborates the view of Okey (2007) who reported that many business enterprises fail because the operators of such businesses lack appropriate entrepreneurial skills due to inadequate and irrelevant curriculum contents in the polytechnics. Okey further argued that polytechnic programmes should equip graduates with skills that would make them self-reliant and employable. It is therefore necessary that the curriculum contents of polytechnics be reviewed and be made more practical and functional so as to enable polytechnic graduates possess the competence to be more effective as employees or for self reliance in running personal businesses successfully.

Differences in Technical Skills Acquisition based on Students' Programmes

From a total of 596 participants, 163 (27.3%) were selected from Civil Engineering, 125 (21.0%) from Mechanical Engineering, 167 (28.0%) from Computer Engineering and 141 (23.7%) from Electrical/Electronic Engineering. While Mechanical Engineering recorded the highest participants, Civil Engineering recorded the lowest participants. The result of the tested research hypothesis 5 showed the mean difference (**F**= 3.070 at .072) which indicated that there was no significant difference in technical skills acquisition based on students' programmes.

The students' programmes were not a determinant of technical skills acquisition in the polytechnics; this means that the level of technical skills acquisition in the polytechnics

depended on other factors rather than the different departments or programmes of the students. The four engineering programmes chosen for the study were: Civil, Mechanical, Electrical/Electronics and Computer Engineering. The students' enrolment were different for these programmes, the Computer Engineering had the highest enrolment of 167 (28%), followed by Civil Engineering with 163 (27.3%), and Electrical/Electronic with 141 (23.7%), while Mechanical Engineering had the least enrolment of 125 (21.0%). The level of the technical skills acquisition of the students in the different programmes could have been determined by resource availability, adequacy and utilization; curriculum contents which may differ from one programme to another. Civil, Mechanical, Electrical/Electronics and Computer Engineering are four core engineering programmes that contribute immensely to the industrial development of Nigeria. It is therefore required that efforts be made to prepare students in these programmes for technical skills acquisition. These views are supported by other researchers; the scarcity of technical personnel and problem of their production in the required quantity constitutes the greatest obstacle to Nigerian technological advancement (Yakubu, 2005).

The inadequate supply of technicians has nearly ground to a halt the technological services in the country such as telephones, electrical supply, refineries, etc. The critical factors hindering technical skills acquisition in the different programmes in the polytechnics include inadequate provision of instructional materials, tools and equipment; poor or lack of maintenance of available materials and equipment; inadequate supply of qualified technical teaching staff; curriculum that does not reflect the reality of the economy; inadequate funding of technical and vocational education; and poor provision of educational infrastructure.

Technical education is positively highly related to economic development. Tinbergen (1952), in his positivist analytical economic theory model, asserts that with investment, there is a parametric change on the endogenous variables of an economic system. Tinbergen further opines that investment in technical education is expected to have utility effects on all sectors of the economy and should influence the rate of economic development.

Yakubu (2002) found that the level of development of any society depends on the level of technical skills acquisition its citizens acquired and applied to society. Nwangwu (2000) argued that industrialization breakthrough is solely accomplished through the ardent pursuit of technical skills acquisition. Odumosu (2005) averred that the sustainable development depends on a well articulated, functional science and technical skills acquisition programmes. There is hardly any economic activity that is not propelled by science and technology (Njoku, 2001), hence Esiobu (2005) noted that science and technology have long been recognized as the engine that drives economic development. Therefore, investment in technical skills acquisition, with its consequent application to socio-economic development, will certainly cause rapid transformation and advancement. This will facilitate the attainment of the Sustainable Development Goals (SDGs) and drive the goals of the National Economic Empowerment Development Strategy (NEEDS).

The significance of technical skills acquisition to national development cannot be overemphasized. Anya (2008) believes that increase in technical skills acquisition is essential for the economic development of any country. What is needed for any evolving nation is how the production of skilled manpower can be improved upon to make for rapid industrial and technological development. Edem (2005) predicts that in time to come, only people with appropriate and appreciable knowledge and skills in science and technology would be required in the labour market.

Technical Skills Acquisition and Ownership of Polytechnics

Out of 596 participants, 208 (34.9%) were selected from federal polytechnics, 217 (36.4%) from state polytechnics while 171 (28.7%) were from private polytechnics. Even though there were more private polytechnics in South-West Nigeria, the students' enrolments were higher in federal and state polytechnics than in the private polytechnics at the time of the study. Findings from research hypothesis 6 showed a mean difference (**F**=1.395 at **p**= .249) which indicated that there was no significant difference in technical skills acquisition based on ownership.

During data collection, the researcher found that the private polytechnics concentrated on business-related programmes such as marketing, banking and finance, secretarial studies, etc at the expense of engineering courses. This could be because of the expensive nature of the equipment required for engineering programmes. The government- owned polytechnics were more equipped, less expensive in terms of school fees than the private polytechnics; this accounted for low students' enrolment in private polytechnics. The justification for this is not farfetched. If more technical skills could be acquired at a lower cost in the public institutions especially the federal polytechnics, it becomes more reasonable for students to attend government- owned polytechnics where more and different skills could be acquired.

The importance of technical skills acquisition for employment, self-reliance and hence the promotion of industrial development is corroborated by other researchers. Technical skills acquisition is one of the aspects of Nigerian education in which its curriculum was designed to enable the beneficiaries use both the hands and the brain while learning. However, this aspect did not develop quickly in Nigeria and that invariably affected the Nigerian industrial and technological development. Adeyemi and Ogonor (1997), and Kwale (1998) asserted that educational growth in Nigeria was lopsided because of the undue emphasis that was placed on general education at the expense of technical skills acquisition.

According to Ejiogu (2000), the prevalent manpower situation in Nigeria today is generally characterized by large-scale unemployment for those without special skills or relevant training. He further averred that the neglect of technical skills acquisition is socially and economically injurious because it robs the nation of the contributions the graduates would have made to national development. Ukpong (2001) noted that the existence of a divergence between the world of learning and the world of work was caused by the existence of gaps between the educational system and the labour market. He further opined that the dire consequences generated by this, namely the human resources wastage in its various forms and the emergence of a dangerous phenomenon of educated unemployed in the labour market, needs urgent attention. Nigeria cannot develop without well-equipped technicians and technologists.

Technical Skills Acquisition and Gender

With respect to gender, 381 (63.9%) male students were selected, while the remaining 215 (36.1%) were female. The result of the tested research hypothesis 7 showed that there was a significant difference in technical skills acquisition in the polytechnics between male and female students ($t= -1.245$; $p<.05$).

Core engineering programmes seemed to be gender- biased. More male students are found in civil and mechanical engineering than female students because of the nature and activities involved in such programmes. The preference of the male students for engineering programmes motivates and prompts their technical skills acquisition in the polytechnics. Reporting on gender issue and technical skills acquisition in the polytechnics, Yakubu (2005) found that the female enrolment in relation to the total enrolments in the polytechnics showed that the overall female enrolment in polytechnics was about 40% of the total. Yakubu also found that the majority of the female students were in non technology-based programmes, except Science Laboratory Technology. The female out-turn in relation to male out-turn was also found to be about one-third (34%) of the total Out-turn. This indicates a slightly lower completion rate for female than male students.

Joint contributions of Resource Availability, Adequacy and Utilization; and Curriculum contents to Technical Skills Acquisition in the Polytechnics

On the joint contributions of the variables, the explanatory variables (Resource availability, adequacy and utilization; and curriculum contents) contributed 3.2% to the variance in technical skills acquisition in the selected polytechnics. By implication, the remaining 96.8% was due to residual and other variables not included in this study. To determine whether the Adjusted R Square value of .032 obtained is significant or not, the Analysis of Variance of the regression analysis was run. It was found that **F** value of 5.970 was significant at **p** =.000. This means that the contribution of the selected variables was not due to chance. Rather, these factors were determinants of technical skills acquisition in the selected polytechnics in South-West, Nigeria.

Relative contributions of Resource Availability, adequacy, Utilization; and Curriculum contents to Technical skills acquisition

With respect to the relative contributions of resource availability, adequacy, utilization; and curriculum contents to technical skills acquisition, the findings showed that the selected variables had varied contributions to technical skills acquisition as indicated by the standardized Beta values (**β).** The four variables were found to contribute differently to technical skills acquisition in polytechnics. Specifically, resource adequacy contributed the highest (=.188), followed by resource utilization (**β**=.178**)**, curriculum content (**β**=.133) and resource availability (**β** =.054). The contributions of all the explanatory variables are significant. By implication, the variables with higher relative contribution should be sustained, while those with lower relative contribution should be improved upon in order to increase the level and the rate of technical skills acquisition in the South-West Nigerian polytechnics.

CHAPTER FIVE

SUMMARY OF FINDINGS, IMPLICATIONS AND CONCLUSION

The summary of the findings, the implications of the findings, contributions to knowledge and the conclusion are presented in this chapter.

Summary of Findings

The resource availability for library, lecture rooms, workshop and instructional materials were high, while that of machinery, equipment, electricity and gas were low. There should be more provision of resources with low availability in order to enhance technical skills acquisition in the polytechnics.

Library resources, lecture rooms, workshop personnel, and instructional materials were adequate in the polytechnics while machinery/transportation, equipment, workshops, electricity & gas were inadequate. The inadequate resources should be attended to in order to promote technical skills acquisition in the polytechnics.

Among the resources that were highly utilized in the polytechnics were library, lecture rooms, workshop personnel and instructional materials while electricity and gas, and workshops could not be utilized because of their inadequacy.

The coverage of the curriculum contents, its competence-based, learners' centeredness, relevance to skills' acquisition were found to be high, while its up- to- date for skills acquisition meeting the needs of employers, dynamism and forward looking and promotion of the workplace operations were low. The findings call for the review of the curricula to make it relevant to employers' need.

On the joint contributions of the variables, the explanatory variables (Resource availability, adequacy and utilization; and curriculum contents) contributed 3.2% to the variance in technical skills acquisition in the selected polytechnics. By implication, the remaining 96.8% was due to residual and other variables not included in this study.

With respect to the relative contributions of resource availability, adequacy, utilization; and curriculum contents to technical skills acquisition, the findings showed that the selected variables had varied contributions to technical skills acquisition as indicated by the standardized Beta values (**β).** The four variables were found to contribute differently to technical skills acquisition in polytechnics. Specifically, resource adequacy contributed the highest while resource availability contributed the lowest. The contributions of all the explanatory variables are significant. By implication, the variables with higher relative contribution should be sustained, while those with lower relative contribution should be improved upon in order to increase the level and the rate of technical skills acquisition in the South-West Nigerian polytechnics.

The findings indicated significant relationships among resource availability, utilization, curriculum contents' adequacy, gender and technical skills acquisition in the polytechnics. There was no significant relationship resource adequacy, students' programmes, institutional ownership and technical skills acquisition in the polytechnics.

In summary, the study has shown the relationships among institutional factors (resource availability, adequacy, and utilization; and curriculum contents' adequacy) and technical skills acquisition in the selected polytechnics. These findings have implications for educational policy, practice and further research.

The study recommended that more practical work should complement theories in the polytechnics; more resources and qualified staff should be provided for impartation of technical skills; that the curricula of polytechnics should be reviewed to align with labour market's demands and the gap between school and work place should be bridged through Students' Industrial Work Experience Scheme (SIWES).

Implications of Findings for Policy

1. The wide gap between the school and the industry should be bridged by a more effective skills acquisition policy through school-industry linkage. The Student Industrial Work Experience Scheme (SIWES) should be strengthened in the polytechnics in order to achieve the aims and objectives of technical education.
2. Government, organizations and private individuals should intensify efforts for the provision of electricity, gas and well equipped workshops and qualified staff for the implementation of an effective technical skills acquisition policy in the polytechnics.
3. Government should initiate an effective skills acquisition policy and embark on its successful implementation for the transformation of Nigeria's economy, since the study showed that many technicians and technologists produced in the polytechnics did not possess the skills required for employment or self-reliance in the labour market which made them remain unemployed.
4. Educational policies that would promote the provision of adequate educational resources to the polytechnics as input for the attainment of the required output should be effectively implemented by the government through relevant educational agencies.
5. Policies that would promote effective utilization of the available resources to full capacity in order to avoid wastage or underutilization should be adopted. This can be done through the centralization of educational resources for both part-time and full-time programmes.

6. There should be an effective policy concerning the one year compulsory Industrial Training (IT) for polytechnic graduates between National Diploma (ND) and Higher National Diploma (HND) for the promotion of practical experience in the industries for capacity building and external efficiency of the programmes. This is necessary because most of the students on IT are not really exposed to practical training during the exercise. This is probably due to the fears entertained by the industrialists that their equipment might be spoilt if the trainees are given freehand to handle them. A policy on close and strict supervision of trainees in order to avoid damage to equipment and materials will help to allay the fears of the industrialists.

Implications of Findings for Practice

1. There should be more practical work to complement theory in the polytechnics so as to equip graduates with functional education. The ratio of theoretical work to practical activities should be 30:70 because students learn more from what they see and remember more of what they practise.
2. There should be provision of more resources for the replacement of obsolete ones so as to impart technical skills in polytechnic graduates for employability and self-reliance.
3. Existing polytechnic curricula should be reviewed to suit the demands of the labour market. Government should look into and improve programmes in the polytechnics to encourage skills acquisition among the technologists.
4. The frequency of resource utilization should be maximized in order to avoid their under utilization or wastage.
5. The Science-Arts, Practical-theory ratio of 70:30 should be more effectively and aggressively pursued for the provision of technical skills acquisition programmes in the polytechnics.

6. Broad-based technical education should be strengthened at the secondary school level; this would lay a solid foundation for technical skills acquisition at the higher education level, particularly in the polytechnics.

Contributions to Knowledge

1. The study developed a conceptual framework that explains the impartation of the required skills to promote the production of competent technologists for the development of the Nigerian economy, which could be used by other researchers in this area.
2. The study provided empirical data on institutional factors/requirements that can facilitate effective implementation of technical skills acquisition policy in polytechnics which can invariably ensure the production of competent graduates.
3. The study added to the body of literature on the relationships among resource availability, adequacy and utilization; curriculum contents' adequacy and technical skills acquisition in the South-West Nigerian polytechnics.

Suggestions for Further Studies

Since no single research study can cover all that needed to be researched into, more questions more than originally intended often beg for answers at the end of most research works. This study has opened doors for similar and entirely different investigations on technical skills acquisition in the polytechnics and other tertiary institutions in Nigeria and abroad. Given the above, the following studies are suggested to other researchers:

1. A replication of the same study can be done in other geo-political Zones in Nigeria for the purpose of comparative analysis.

2. Other studies that would consider other variables not included in this study are necessary.

3. This study was conducted in polytechnics; similar studies can focus on engineering technology in the Universities.

4. Similar studies in polytechnics can consider other programmes different from engineering technology.

Conclusion

The study found some relationships between institutional factors (Resource availability, adequacy and utilization; curriculum contents' adequacy) and technical skills acquisition in South-West Nigerian polytechnics. There is, therefore, the need for appropriate policy on effective skills acquisition. Polytechnics should emphasize synergy between practical work and theory, and review of curricula. In addition, efforts should be intensified on the provision and utilization of physical, material and human resources that are required for technical skills acquisition so that the required skills will be adequately imparted in polytechnic graduates to meet labour market demands, to promote self-employment and job creation, and to achieve industrial development in Nigeria.

REFERENCES

Adebesin, J. B. (2006). An in-depth review of the present state and focus on technical and vocation education in Nigeria. *Paper in the proceedings of the conference of the Nigerian Association of Teachers of Technology (NATT),* Lagos: Fembis International.

Adegbesan, S. O. (2007). Vocational and technical education and training. In A. O. Ayoola and B. P. Ehinmipare (Eds.), *Technical and vocational education*: *Assessment and examination (policy issue).* Ibadan: Gebeslher Educational Publishers. 85-87.

Adeogun, A. A.(1999*).* Resource provision and utilization: A case study of technical colleges in Lagos State. *African Journal of Educational Management and Planning, 1 (*1), 74-81.

Adeogun, A. A. (2001*).* Instructional resources and school effectiveness in private and public secondary schools in Lagos State. *Journal of Educational Administration and Planning 1*(3), 54-61.

Adeogun, A. A. & Oshifila, G. I. (2007*).* Managing the teaching and learning of technical and vocational education: Determinants, problems and prospects. *Nigeria Journal of Educational Administration and Planning, 7(*2), 155-168.

Afeti, G. (2007). Strategy to revitalize technical and vocational education and training (TVET) in Africa. *Meeting of the Bureau of the conference of ministers of education of African Union.* Addis Ababa-Ethiopia.

African Union, (2007*).* Framework for post conflict reconstruction and technical and vocational education and training .*Department of human resources and technology.*

Akerele, W. O. (2007). Management of technical and vocational education in Nigeria: The challenges of the country. *Journal of Educational Administration and Planning. 3*(1), 11-21.

Akpan, G. A. (1983). Factors militating against the effectiveness of technical education

programme in comprehensive secondary Schools in Cross River State. Unpublished B Sc. Thesis. University of Nigeria. Nsukka.

Alani, R. A. (1988). Economic returns to investment in teacher education in Ogun State of Nigeria. *Unpublished doctoral thesis, Department of Educational Management* University of Ibadan.

Anya, O. A. (2008). Challenge of science and technology in the 21st century: A Nigerian perspective. *A paper presented at the 11th public lecture of the Uduogie Ivowi Education Foundation held on Saturday 8th December.*

Ashby, E. (1960). Investment in education. *Report of the commission on post secondary school certificate and higher education in Nigeria. Lagos.*

Awhinana, O. W. (2008). Empowering youths for self reliance: Issues of competence. *Paper presented at the annual Otoibiri Youth Conference,* Yenogia. Bayelsa State.

Ayeni, A. O. & Oladapo, S. A. (2007). Training for employment of technical college graduates. *Journal of Applied Research in Education, 5*(1), 116-123.

Ayua, M. T. (2006). Consolidating and sustaining industrial performance of school product in technical education for national development. *A paper presented at the conference of the Nigerian Association of Teachers of Technology (NATT*). Lagos. October 18th 2006.

Baiyelo, T. D. (2009). Extracting values from science and technology education in a depressed economy. *In U.M.O*. Ivowi (Ed*.), Education for value*. Lagos: Foremost Education Services Ltd.

Barky, A. L. (2005). Selecting teaching methods and materials. *Agricultural education magazine. Agricultural Research Institute.* Umudike.

Bertalanffy, V. L. (1998). *General system theory*: *Foundation, development, application.* NewYork, George Brazillen.

Binitie-Cassidy, L. O. (2011). Input factors and student skills acquisition in technology programmes of polytechnics in South-South Nigeria. *Unpublished Ph. D thesis* University of Lagos.

Briggs, B. C. (1979*).* Investment in secondary education in Nigeria: Exploration by analysis. Ibadan: Nigeria Institute of Social and Economic Research. University of Ibadan Mimeograph Series. (6).

Brand, B. (2008). Supporting high quality career and technical education through federal and state policy. American Youth Forum..

Chen, D. H, & Kee, H. L, (2005). A model on knowledge and endogenous growth: *World bank policy research working paper* 3539.

Chukwuma, F.C. (2007). Human resources development in tertiary institutions in Africa: *Issues, concerns and directions in African Union. In Akubue & D. Enyi (Eds.), Crisis and challenges in higher education in developing countries.* (79-84). Isadont Wisdom Publisher.

Dasmani, A. (2012). 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.

Dike, V. E. (2005). *Missing link in Nigeria's development Policy. Retrieved from: http//www.nigeriavillagesquare.com/articles.*

Edem, E. (2005). *Technical education for development*. Lagos: Adecross Educational Service Ltd.

Ehiametalor, E. T. (2001). School facilities management practices in Nigeria. In N. A. Nwagwu, E. A. Ehiamentalor, M. A. Ogunu and M. Nwadiani, (Eds.), *Current issues in educational management in Nigeria.* (pp.305-319) Benin City: NAEAP.

Ejiogu, A. (2000). Human resource management, *toward greater productivity*. Lagos. Generation Press Ltd.

Emmanuelson, A. O., Franzen, E. & Narman, A. (1988). A tracer study evaluation of Botswana Brigades, March-April. occassional paper*. N0 11.Department of human resourses and economic geography.* University of Gothenburg.

Esiobu, G. O. (2005). Gender issues in science and technology education for development In U.M.O. Ivowi (Ed), *Science and technology, education for development.* Lagos: Adecross Education Service Limited.

Etuk, G. K. (2005*).* Globalization and university education. Gender differences in employability skills possessed by students*. International Journal of Arts and Technology Education, 5* (1), 115-123.

Etuk, G. K. & Eyo, E. E. (2007*).* Gender and employment aspiration of vocational students in Itu local government area of Akwa Ibom State: Implication for personnel management under globalization*. Nigeria Journal of Education Administration and Planning, 7(*2), 61-73.

Faluyi, A. O. (1993). Challenges of polytechnic education: *Proceedings of seminar on Bridge programmes.* 23.

Federal Republic of Nigeria, (2006). Federal Polytechnic Acts: *The objectives of technical education.* NBTE, Kaduna.

Federal Republic of Nigeria (2013*). National Policy on Education (revised).* Federal Government Press.

Finch, C. R. & Crunkilton, J. R. (1999). Curriculum development in vocational and technical education: *Planning, content and implication. (5th Edition). Boston:* Allyn and Bacon*.*

Fraser, A. L. (2008). Vocational-technical education in Massachusetts. *A pioneer institute white Paper. No 42, October 2008.*

Fuller, B. (2000). What school factors raise achievement in the third world*? Review of Educational Resources, 57*(3), 255-292*.*

Godfrey, N. N. (1996). The impacts of some selected variables on practical skills acquisition by technical college students in Lagos State. *Unpublished Ph.D thesis, University* of Lagos.

Hallak, J. (1990). *Investing in the future*: *Setting educational priority in the developing*

World.Parish: UNESCO IIEP/ Perganon.

Hu, T., Lee, M.L. & Stromsderfer, E.W. (1971). Economic returns to vocational and comprehensive high school graduates. *Journal of Human Resources, 8* (1), 25-50.

Ibehim, C. (1994). *Need for trade school renaissance.,* Ibadan: Macmillan Company.

Ijeoma, N. E. (2004). The education system as a social organization. In N. A. Nwagwu, N. E. Ijeoma & C. C. Nwagwu (Eds.), *Organization and administration of education: perspective and practices.(*1-34). Benin City: Ferta Printing Press Ltd.

Ilusanya, G. (2005). The state of science, technology and vocational education in Nigeria: A manager's proposal for revitalization. In R. A. Alani (Ed.), *Managing the education System; A book in honour of Prof. O. E. M. Fagbamiye.* Ilesha. Triump Providential Publishers.

Kadri, W. (2002*).* Vocation and technical education in Nigeria: Getting out of rot. *Lead paper presented at the conference of the School of Vocational and Technical Education, Tai Solarin College of Education*, Ijebu Ode, 4th June.

Lanrewaju, J. D. (1994). Examining the potentials of technical and vocational education for Nigerian economy. In S. O. Jamila and M. A. Umar (Eds.), *Issues in teacher education,* (pp. 94-102). Lagos: Text 85 Leisure Publishers.

Madumere, S. C. (2007). School plant planning, facilities management and educational law. Lagos: Okoye Honeybees Enterprises.

Madumere, S. C., Obikwelu, C. N. & Olisameka, B. U. (2007). Impediments to management operation in two technology institutions in Lagos State. *Nigerian Journal of Technical Administration and Planning, 7* (2), 122-131.

Mbata, A. (1990). Towards a more effective manpower training and development in the field of technical education. *Nigeria journal of Technical Education Review, 2(*1), 18-20.

Michael, S. C. (2009). Entrepreneurial signaling to attract resources: *The case of franchising management decision economics. 30,* 405-422.

Mills, H. R. (1977). *Teaching and training*: *A hand book for instructors (3rd edition),* London: Longman.

Narman, A. (1992). Trainees at Meshi national vocational training centre, Achievement and labour market adoption. *SIDA Education Division Document No. 5.* SIDA Stockholm.

Njoku, S. C. (2001). Enrolment of female in science and technology institutions in Nigeria: Implication for female development. *The Journal of Science Lecturers Association of Nigeria,* 32 (122*),* 87-93.

National Board for Technical Education (2007b). Standard and Criteria for approval of programmes in vocational enterprise institution and innovation enterprise institutions. Kaduna: Author.

National Board for Technical Education (NBTE, 2010). 2010 national survey report on the annual manpower requirement in Nigeria between 2010 and 2015. Kaduna: Author.

Nnamchi, I. F. (2008). Economic returns to investment in technical teacher education in Southern Nigeria.(Unpublished Ph.D Thesis), University of Lagos, Lagos.

Nneji, N. G. (1998). Optimization of available resources: Material for high productivity in technical colleges. *Paper presented at the Lagos State Public Service Development centre. Performance improvement workshop. Febuary 23rd-27th.*

Nwankwo, J. I. & Okunola P. O. (1988). Human resources provision and utilization in secondary schools in Oyo State of Nigeria. *Journal of Research in Curriculum (JORC), 6(*2), 99-106.

Nwangwu, R. (2000*).* Bridging the gap between education and the world of work. In M. A. Ejiogu & R. A.Alani, (Eds.), *Emergent issues in Nigerian education. Vol.3 (114-128), Lagos: Mukugamu Nig. Co.*

Obaro, C. A. & Osonade, F. (1999*).* The place of curriculum in sustainable democracy and political stability. *Nigerian Journal of Curriculum and Instruction, 8 (*1), 27-31.

Obayan, P. A. I. (1980). *General method of teaching in Nigeria*. Lagos: Macmillan.

Oguntoye, A. O. (1987). Financial distress in the Nigerian educational system. In A. M. Ejiogu (Ed.), *Emergent issues in Nigeria education* (pp. 41-59). Lagos: Joja

Educational Research & Publishers.

Odumosu, A. (2005*). Environmental education in nation development.* In U.M.O. Ivowi (Ed), *Science and technology education for development.* (pp. 172-183). Lagos: Adecross Education Services Limited.

Oguntoye A. O. & Alani, R. A. (1998). *Financing education in Nigeria: Theory and practice.* Ilaro: Kingsbond Investment Ltd.

Okebukola, P. A. (1998). Trend in tertiary education in Nigeria. In P. A. Okebukola(Ed.), *The State of education in Nigeria.* (pp. 84-102), Lagos: UNESCO.

Okereke, V. E. (2000*).* Analysis of the distribution of students in the new secondary school structure of some schools in Bauchi State. In J. O. Fadipe & E. E. Olachukwu (Eds.), *Educational planning and administration in Nigeria in the 21st Century.* Ibadan. NIEMA.

Okey, E. N. (2007). Curriculum innovation in technical and vocational education. *Paper presented at the international conference and exhibition on technical and vocational education, organized by Education Trust Fund (ETF):* Abuja, March, 28-30.

Okorie, J. U. (1993). An overview of the development of vocational and technical education in Nigeria. In E. U. Anyakoha & E. C. Oguala (Eds.), *Vocational technical education and self-reliance*. Nsukka: UNN Nsukka. NVA Publication.

Olakulehin, F. K. (2007). Information communication technology in lecturers training and professional development in Nigeria. *Turkish Journal of Distance Education. 8 (*1*)* 133-142.

Olusakin, A. M. (2005). Factors affecting female participation in technical education in Nigeria as perceived by students of Federal College of Education*: Implication for counselling*. In R. A. Alani (Ed.), *Managing the education system: A book in Honour of Prof. O. E. M. Fagbamiye.* (pp. 140-159) Ilesa: Triumph Providential Publishers.

Oni, J. O. (1995). *Educational resources*: *An introduction.* Abeokuta. Gbemi Sodipo Press Ltd.

Onyene, V. & Fabiyi, A. (2007). Evaluation of the effectiveness of part-time programme in Nigerian universities. *Lagos Journal of Education Administration and Planning. 3 (*1), 67-76.

Osiyale, A. (2000*).* The history and development of science and technology education in Nigeria. In U.M.O. Ivowi (Ed.) *Science and technology education for development* (pp. 25-45). Lagos: NERDC Press.

Rodney, W. (1973*). How Europe underdeveloped Africa.* London: Bogle- Louverture Publications.

Schmuck, R. & Schmuck, P. A. (1971). Group process in the classroom. Iowa, winc Brown.

Schutz, T.W. (1971*). The economic value of education*. New York: Columbia University Press.

Sofolahan, J. P. (2005). Quality assurance, instructional resources and students academic performance in Lagos State secondary schools. (Unpublished Ph.D Thesis), University of Lagos, Lagos.

Taylor, D. C. (2000*). Resources for planning*. Great Britain*:* Hazek Watson and Viney.

Tinbergen, J. (1952). *On the theory of economic policy*. Amsterdam: North Holland.

Uche, C. M. & Kpee, G. G. (2007*).* The labour market and skills oriented graduates in Port Hacourt City, River State*. Nigeria Journal of Educational Administration and Planning, 7* (2), 133-142.

Ukoha, U. A. (2001). Educators and students' occupational expectations of technical education. *Curriculum and the adequacy in meeting the expectations*, 9 (1), 28-35.

Ukpong, E. (2001). *Bridging tertiary institutions and labour market in Nigeria.* Ibadan. Sibon Books Ltd.

Umar, I. Y. & Ma'aji, A. S. (2010). Repositioning the facilities in technical college workshops for efficiency: A case study of North Central Nigeria*. Journal of Technical Teacher Education, 47*(3), 1-9.

UNESCO (2001). *Revised recommendations in technical and vocational training. An analysis of the missing links.* Ibadan. Sibon books Ltd.

UNESCO (2004)*. The state of education in Nigeria*. Abuja: Author.

Uzoagulu, A. E. (1993). Towards an effective equipment management in schools for economic and technological self-reliance. *Nigerian Vocational Journal*, 6 (1). 27-30.

Yakubu, N. A. (2000*).* Identification and assessment of resources requirement in technical and vocational education in Nigeria. In O. Aina (Ed.), *Technical and vocational education in Nigeria: Vision and action,* Abuja: Seminar proceeding.

Yakubu, N. A. (2005). The state of polytechnic education in Nigeria: *Paper delivered at the National Summit on Higher Education held at ECOWAS Secretariat* Abuja. 10th-16th March, Polytechnic Sector News *22* (22).

Yakubu, N. A. (2005). Six decades of polytechnic education in Nigeria*: The Journey so far*. *Paper presented at the National Polytechnic Expo, December 13th, 2005,* Kano, Nigeria.

Yakubu, N. A. (2008). In Management in Nigeria: *Communication of the 2007 National conference of the N.I.M. held at Kano.* 9.

Yakubu, N. A. & Mumah, S. N. (2005). *The growth and development of polytechnic education in Nigeria.*

APPENDICES

APPENDIX A

DEPARTMENT OF EDUCATIONAL MANAGEMENT

SCHOOL OF POSTGRADUATE STUDIES

UNIVERSITY OF LAGOS, AKOKA

INSTITUTIONAL FACTORS AND TECHNICAL SKILLS ACQUISITION QUESTIONNAIRE (IFTSAQ)

Dear Participant,

This questionnaire is designed with a view to collecting data on the above research for a Ph D Thesis in the Department of Educational Management, University of Lagos. The information provided shall be solely used for this primary objective. Your genuine information will go a long way at addressing graduates unemployment problem in Nigeria.

Thank you in anticipation of your favourable cooperation and understanding.

Gideon V. O.

SECTION A: DEMOGRAPHIC BACKGROUND OF THE PARTICIPANTS

Gender: Male ☐ Female ☐

Age: 15 - 19 ☐ 20 - 24 ☐ 25 – 29 ☐ 30 – 34 ☐

Institutional Ownership: Federal ☐ State ☐ Private ☐

Discipline: Civil Engineering ☐ Mechanical Engineering ☐

Computer Engineering ☐ Electrical/Electronic Engineering ☐

SECTION B: CURRICULUM CONTENTS ADEQUACY (CCA)

Instruction: Please tick ( ) the extent to which you agree or disagree with the following statements. Note: SA=Strongly Agree; A=Agree; D=Disagree; SD=Strongly Disagree

SN	CURRICULUM CONTENTS ADEQUACY ITEMS	SA	A	D	SD
1	The Curriculum adequately covers NBTE's specifications				
2	The Curriculum is learner-centered				
3	The Curriculum is competence- based				
4	The Curriculum is relevant to skills acquisition				
5	The Curriculum is up-to- date for skills acquisition				
6	The Curriculum meets the needs of employers				
7	The Curriculum guarantee acquisition of the desired skills				
8	The Curriculum promotes self-reliance/employment				
9	The Curriculum is dynamic/forward looking				
10	The Curriculum promotes school- industrial linkage				

11	The Curriculum promotes understanding of workplace operation				
12	The Curriculum fosters practical skills.				

SECTION C: RESOURCE AVAILABILITY ASSESSMENT CHECKLIST (RAAC)

Instruction: Please tick ( ) the level to which the under-listed resources are available in your Department. Note: HA= Highly Available; MA= More Available; LA= Least Available; NA= Not Available

SN	RESOURCES	HA	MA	LA	NA
1	How available is machinery//transportation in polytechnics?				
2	To what extent is library resource available in polytechnics?				
3	How available is equipment/tools in polytechnics?				
4	How available is ICTs in polytechnics?				
5	To what extent are lecture rooms available in polytechnics?				
6	How available is workshop staff in polytechnics?				
7	To what extent is electricity/gas available in polytechnics?				
8	To what extent are workshops available in polytechnics?				
9	How available are the consumables in polytechnics?				
10	How available are instructional materials in polytechnics?				

SECTION D: RESOURCE ADEQUACY ASSESSMENT (RAA)

Instruction: Please tick ( ) the extent to which you agree or otherwise to the following statements. Note: SA=Strongly Agree; A=Agree; D=Disagree; SD=Strongly Disagree

SN	RESOURCES	SA	A	D	SD
1	There is adequate machinery/transportation in my department				
2	Library resources are adequate in my department				
3	We have adequate Equipment/Tools in my department				
4	ICTs (Computers, Lap Tops, Projector, etc) are adequate in my department				
5	My department has adequate Lecture rooms				
6	There are adequate Workshop Personnel / Instructors in my department				
7	Electricity/Gas is adequate in my department				
8	There are adequate Workshops in my department				
9	There are adequate consumables (Chemical, water, markers, chalks) necessary for skills acquisition in my department				
10	Other instructional materials (Books, graphs, maps, models) are adequate in my department				

SECTION E: RESOURCE UTILIZATION ASSESSMENT CHECKLIST (RUAC)

Instruction: Please tick ( ) the extent to which the under-listed resources are being frequently utilized in your Department. Note: DU= Daily Utilized; WU= Weekly Utilized; MU= Monthly Utilized; RU= Rarely Utilized

SN	RESOURCES	DU	WU	MU	RU
1	How utilized is machinery/transportation in polytechnics?				
2	To what extent is library utilized in polytechnics?				
3	How utilized is equipment/tools in polytechnics?				
4	How utilized is ICTs in polytechnics?				
5	To what extent are lecture rooms utilized in polytechnics?				
6	How utilized are workshop staff in polytechnics?				
7	How utilized is electricity/gas in polytechnics?				
8	To what extent are workshops utilized in polytechnics?				
9	To what extent are the consumables utilized in polytechnics				
10	How utilized are instructional materials in polytechnics?				

SECTION F: TECHNICAL SKILLS AQUISITION ASSESSMENT (TSAA)

Technical Skills: The skills that require the ability to identify and use certain equipment and machines to do certain work or perform certain operations.

Instruction: Please tick ( ) the extent to which the following technical skills apply to you. Note: MLM=Most Like Me; LM=Like Me; NLM=Not Like Me.

	Skills	Description	MLM	LM	NLM
1	Project Management	Ability to plan, organize, motivate, and control resources, procedures and protocols to achieve specific goals in scientific or daily problems.			
2	Repairing	Ability to put already damaged tools into further use.			
3	Data mining/Knowledge Discovery	Ability to analyze data from different perspectives and summarize them into useful format to generate information.			
4	Communication/Inter-Personal	Ability to explain what you mean in a clear and concise way through written and spoken English. To listen and relate to other people, and to act upon key information / instructions.			
5	Teamwork	Work confidently within a group in work organization.			
6	Creativity	Generates & applying new ideas & solutions			
7	Analysing/	Gather information systematically to establish			

	Investigating	facts and principles.			
8	Planning	Ability to set and follow a course of action to accomplish goals.			
9	Leadership	Ability to motivate and direct others in work organization. Utilizes skills and methods to develop and guide direct reports towards goals			
10	Tenacity	Stays with a plan of action until completed or it is no longer attainable.			
11	Big Data analytics	Capture real value through data analytics and who can manage enterprise risks.			
12	Structured Query Language (SQL)	Ability to work with nearly all databases Quickly, pull out key data components and generate reports that aid the decision-making process.			
13	Technical writing	Ability to understand technology and write about such in a way everyday users can understand.			
14	Time management	Manage time effectively, prioritizing tasks and able to work to deadlines.			
15	Computing	Word-processing, using databases, spreadsheets, the Internet & email, designing web pages, etc.			
16	Decisive	Makes decisions, renders judgment and takes action.			

APPENDIX B

Polytechnics Resource Profile Checklist on Resource Availability, Adequacy, Utilization and Curriculum contents adequacy in the Polytechnics

Resource	Resource Availability		Resource Adequacy		Resource Utilization		Curriculum content Adequacy	
	%	Remark	%	Remark	%	Remark	%	Remark
Machine/transport	32	Low	30	Low	41	Low		
Library	91	High	76	High	91	High		
Equipment/Tools	49	Low	44	Low	52	Low		
ICTs	70	High	70	High	71	High		
Lecture rooms	78	High	79	High	89	High		
Workshop personnel	70	High	72	High	73	High		
Electricity	12	Low	13	Low	18	Low		
Workshop/Laboratory	20	Low	13	Low	75	High		
Consumables	71	High	71	High	70	High		
Instructional materials	75	High	74	High	78	High		
NBTE's specification							96	Highly Adequate
Learners- centred							92	Highly Adequate
Competence- based							87	Highly Adequate
Skills acquisition Oriented							90	Highly Adequate
Employability							35	Inadequate
Dynamism							49	Inadequate
School-Industry linkage							73	Highly Adequate
Overall Average	**56.8**	**Low**	**51.2**	**Low**	**75.8**	**Highly adequate**	**74.5**	**Highly Adequate**

APPENDIX C

LIST OF POLYTECHNICS IN NIGERIA BY STATE, TYPE, LOCATION AND STATUS.

Abuja FCT	Dorben Polytechnic	Polytechnic	Abuja	Private
Adamawa State	Adamawa State Polytechnic	Polytechnic	Yola	State
Adamawa state	Federal Polytechnic, Mubi	Polytechnic	Mubi	Federal
Akwa Ibom State	Akwa Ibom State Polytechnic	Polytechnic	Ikot Ekpene	State
Akwa Ibom State	Akwa-Ibom College of Agriculture	Agricultural		
Akwa Ibom State	Foundation College of Technology	Innovation Polytechnic	Ikot Ekpene	Private
Akwa Ibom State	Maritime Academy of Nigeria	Miscellaneous	Oron	Federal
Anambra State	Ekwenugo Okeke Polytechnic	Polytechnic		State
Anambra State	Federal Polytechnic, Oko	Polytechnic	Oko	Federal
Bauchi State	Abubakar Tafari Ali Polytechnic	Polytechnic		State

Bauchi State	Federal Polytechnic, Bauchi	Polytechnic	Bauchi	Federal
Bayelsa State	Bayelsa State College of Arts and Science	Polytechnic		State
Benue State	Benue State Polytechnic	Polytechnic		State
Benue State	Akperan Orshi College of Agriculture	Agricultural	Gboko	State
Borno State	Borno College of Agriculture	Agricultural		
Borno State	Ramat Polytechnic	Polytechnic	Maiduguri	State
Cross River State	Ibrahim Babangida College of Agriculture	Agricultural	Obubra	
Cross River State	The Polytechnic, Calabar	Polytechnic	Calabar	State
Delta State	Delta State College of Agriculture	Agricultural		
Delta State	Delta State Polytechnic: (three institutions)	Polytechnic	Ozoro Ogwashi-Uku Otefe-Oghara	State
Delta State	Petroleum Training Institute	Miscellaneous	Effurun	Federal

Ebonyi State	Akanu Ibiam Federal Polytechnic	Polytechnic	Unwana-Afikpo	Federal
Ebonyi State	Federal College of Agriculture, Ishiagu	Agricultural	Ishiagu	Federal
Edo State	Auchi Polytechnic	Polytechnic	Auchi	Federal
Edo State	Kings Polytechnic	Polytechnic	Ubiaja	Private
Edo State	Shaka Polytechnic	Polytechnic	Benin city	
Ekiti State	Federal Polytechnic, Ado-Ekiti	Polytechnic	Ado Ekiti	Federal
Enugu State	Federal School of Dental Technology & Therapy	Miscellaneous	Enugu	Federal
Enugu State	Institute of Management Technology, Enugu	Polytechnic	Enugu	State
Enugu State	Our Saviour Institute of Science and Technology	Polytechnic	Enugu	Private
Imo State	Federal College of Land Resources Technology, Owerri	Miscellaneous	Owerri	Federal
Imo State	Federal Polytechnic, Nekede	Polytechnic	Nekede	Federal
Abia State	Templegate Polytechnic Aba	Polytechnic	Aba	Private
Imo State	Imo State Polytechnic	Polytechnic	Umuagwo	State
Imo State	Imo State Technological Skills	Polytechnic		

	Acquisition Center			
Jigawa State	Hussaini Adamu Federal Polytechnic	Polytechnic	Kazaure	Federal
Jigawa State	Hussani Adamu Polytechnic	Polytechnic		State
Kaduna State	College of Agriculture and Animal Science	Agricultural	Kaduna	Federal
Kaduna State	Federal College of Chemical and Leather and Technology	Miscellaneous	Zaria	Federal
Kaduna State	Federal College of Forestry Mechanisation	Miscellaneous	Afaka	Federal
Kaduna State	Kaduna Polytechnic	Polytechnic	Kaduna	Federal
Kaduna State	Nigerian College of Aviation Technology	Miscellaneous	Zaria	Federal
Kaduna State	Nuhu Bamalli Polytechnic	Polytechnic	Zaria	State
Kaduna State	Samaru College of Agriculture	Agricultural	Zaria	Federal
Kano State	Audu Bako School of Agriculture	Agricultural	Dambatta	State
Kano State	Kano State Polytechnic	Polytechnic	Kano	State

Kano State	Mohammed Abdullahi Wase Polytechnic	Polytechnic		State
Katsina State	Hassan Usman Katsina Polytechnic	Polytechnic	Katsina	State
Kebbi State	College of Agriculture, Zuru	Agricultural	Zuru	State
Kebbi State	Federal Polytechnic, Birnin-Kebbi	Polytechnic	Birnin Kebbi	Federal
Kebbi State	Kebbi State Polytechnic	Polytechnic		State
Kogi State	College of Agriculture, Kabba	Agricultural	Kabba	Federal
Kogi State	Federal Polytechnic, Idah	Polytechnic	Idah	Federal
Kogi State	Kogi State Polytechnic	Polytechnic		State
Kwara State	Federal Polytechnic, Offa	Polytechnic	Offa	Federal
Kwara State	Kwara State Polytechnic	Polytechnic		State
Lagos State	Federal College of Fisheries and Marine Technology	Miscellaneous	Lagos	Federal

Lagos State	Grace Polytechnic	Polytechnic	Lagos	Private
Lagos State	Lagos City Polytechnic	Polytechnic	Lagos	Private
Lagos State	Lagos State Polytechnic	Polytechnic		State
Lagos State	School of Agriculture, Ikorodu	Agricultural	Ikorodu	
Lagos State	Wavecrest College of Hospitality	Monotechnic	Lagos	Private
Lagos State	Wolex Polytechnic	Polytechnic	Lagos	
Lagos State	Yaba College of Technology	Polytechnic	Lagos	Federal
Nasarawa State	College of Agriculture, Lafia	Agricultural	Lafia	State
Nasarawa State	Maurid Institute of Management & Technology, Nasarawa	Polytechnic	Nasarawa	Private
Nasarawa State	Federal Polytechnic, Nassarawa	Polytechnic	Nasarawa	Federal
Nasarawa State	Nasarawa State Polytechnic	Polytechnic		State
Niger State	Federal College of Fresh Water Fisheries Technology	Miscellaneous	New Bussa	Federal
Niger State	Federal College of Wildlife Management	Miscellaneous	New Bussa	Federal
Niger State	Federal Polytechnic, Bida	Polytechnic	Bida	Federal
Niger State	Niger State College of Agriculture	Agricultural	Mokwa	State
Niger State	Niger State Polytechnic	Polytechnic	Zungeru	State
		Polytechnic		Private

Ogun State	Allover Central Polytechnic		Sango-Ota	
Ogun State	Federal Polytechnic, Ilaro	Polytechnic	Ilaro	Federal
Ogun State	Gateway Polytechnic Saapade	Polytechnic		State
Ogun State	Marvic Polytechnic	Polytechnic	Odeda	Private
Ogun State	Moshood Abiola Polytechnic	Polytechnic	Abeokuta	State
Ondo State	Rufus Giwa Polytechnic	Polytechnic	Owo	State
Osun State	Federal Polytechnic, Ede	Polytechnic	Ede	Federal
Osun State	Osun State College of Technology	Polytechnic	Esa-Oke	State
Osun State	Osun State Polytechnic	Polytechnic	Iree	State
Osun State	Polytechnic Ile-Ife	Polytechnic	Ile-Ife	Private
Osun State	Southern Nigeria Institute of Innovative Technology(SNIITPOLY)	Polytechnic	Ifewara	Private
Oyo State	Federal College of Animal Health & Production Technology	Polytechnic	Ibadan	Federal
Oyo State	Federal College of Animal Health and Production Technology, Ibadan	Agricultural	Ibadan	Federal
Oyo State	Federal College of Forestry, Ibadan	Miscellaneous	Ibadan	Federal
Oyo State	The Polytechnic, Ibadan	Polytechnic	Ibadan	State
Oyo State	The KINGS Poly, Saki	Polytechnic	Saki	Private
Oyo State	Tower Polytechnic, Ibadan	Polytechnic	Ibadan	Private
Plateau State	Federal College of Animal Health and Production Technology, Vom	Agricultural	Vom, Nigeria	Federal
Plateau State	Federal College of Education, Pankshin	***Miscellaneous***	Pankshin	Federal
Plateau State	Federal College of Forestry. Jos	Miscellaneous	Jos	Federal
Plateau State	Federal College of Land Resources Technology, Kuru	Miscellaneous	Jos	Federal

Plateau State	Plateau State College of Agriculture	Agricultural		State
Plateau State		Polytechnic		State
Rivers State	Rivers State College of Arts and Science	Poly Technic	Port Harcourt	State
Rivers State	Rivers State Polytechnic	Polytechnic	Bori	State
Taraba State	College of Agriculture, Jalingo	Agricultural	Jalingo	State
Yobe State	Federal Polytechnic, Damaturu	Polytechnic	Damaturu	Federal
Yobe State	Mai Idris Alooma Polytechnic	Polytechnic	Geidam	State
Zamfara State	Abdul Gusau Polytechnic	Polytechnic		State
Zamfara State	Federal Polytechnic, Namoda	Polytechnic	Kaura-Namoda	Federal
Zamfara State	Abdul Gusau Polytechnic	Polytechnic		State

\

APPENDIX D

LIST AND ADDRESSES OF POLYTECHNICS IN NIGERIA.

FEDERAL POLYTECHNICS:

Air Force Institute of Technology Nigerian Air Force

Mailing Address: P.M.B. 2104 Kaduna

Kaduna State. Tel/Fax: 062-319434

E-mail: afit@nigerianairforce.net

Website: www.afitnigeria.net, www.afit.edu.ng

Akanu Ibiam Federal Polytechnic, Unwana, Ebonyi State

Mailing Address: P.M.B 1007, Ebonyi

Website:http://www.polyunwana.net/

Nigeria Army School of Military Engineering

Mailing Address: P.M.B. 102272, Makurdi

Tel: 08079757911

Website: www.tradocna.org/home.html

Auchi Polytechnic,

Mailing Address: P. M. B. 13, Auchi,

Edo State.

Website: www.auchipoly-online.com, www.auchipoly.edu.ng

Federal Polytechnic, Ado-Ekiti,

Mailing Address: P. M. B. 5351, Ado-Ekiti,

Ekiti State.

Website: www.myadoekitipoly.com/index.php, www.fedpolyado.org

Federal Polytechnic, Bauchi,

Mailing Address: P.M.B. 0231, Bauch.

Bauchi State.

Website: www.fedpolybauchi.com/index.php, www.fptb.edu.ng

Federal Polytechnic, Bida,

Mailing Address: P. M. B. 55, Bida.

Niger State. Tel: 066-461707.

Website: www.fedpolybidaportal.com.ng, www.fedpolybida.edu.ng

Federal Polytechnic, Damaturu

Mailing Address: P. M. B. 1006, Damaturu,

Yobe State.

Website: www.polydamaturuportal.com

Federal Polytechnic, Ede,

Osun State

Website: www.fedpolyedeng.net, www.federalpolyede.edu.ng

Federal Polytechnic, Ida

Mailing Address: P.M.B.1037, Idah.

Kogi State. Tel: 058-800118.

Website: www.myidahpoly.com/index.php, www.federalpolyidah.edu.ng

Federal Polytechnic, Ilaro

Mailing Address: P. M. B. 50, Ilaro,

Ogun State

Website: www.federalpolyilaro.edu.ng

Federal Polytechnic, Mubi

Mailing Address: P.M.B. 35, Mubi,

Adamawa State.

Website: www.federalpolymubi.net

www.federalpolymubi.edu.ng

Federal Polytechnic, Namoda

Mailing Address: P. M. B. 1012, Kaura/Namoda.

Zamfara State. Tel: 063-60452.

Website: www.fedpolynamodaonline.com

Feddral Polytechnic, Nassarawa

Mailing Address: Mailing Address: P. M. B. 001, Nassarawa.

Nassarawa State. Tel: 047-66707.

Website: www.fedpolynasonline.com

Federal Polytechnic, Nekede,

Mailing Address: P. M. B. 1036, Owerri,

Imo State.

Website: www.federalpolynekede.net, www.fedpolynek.edu.ng

Federal Poly. Offa

Mailing Address: P. M. B. 420, Offa

Kwara State. Tel: 031-801165, 801043.

Website: www.fedpoffa.edu.ng, www.fedpoffaonline.net

Federal Polytechnic, Oko, Orumba North L .G. A,

Anambra State.

Website: www.federalpolyoko.edu.ng

Federal School of Dental Technology and Therapy, Enugu.

Enugu State.

Website: www.fedsdtten.edu.ng

Kaduna Polytechnic, Kaduna

Kaduna State.

Mailing Address: P. M. B. 2021, Kaduna.

Kaduna State.

Website: www.kadunapolytechnic.edu.ng

Hussaini Adamu Federal Polytechnic,

Mailing Address: P.M.B. 5004, Kazaure.

Jigawa State.

Website: www.hafedpolytech.com

Nigeria Army School of Military Engineering

Mailing Address: P.M..B 102272 Makurdi,

Benue State. Tel: 08079759911

Website: www.tradocna.org/home.html

Waziri Umaru Fed. Polytechnic Birnin Kebbi.

Kebbi State.

Website: www.wufpbk.com

Yaba College of Technology

Mailing Address: P. M. B. 2001,Yaba.

Lagos State. Tel: 01-800160.

Website: www.yabatech.edu.ng

STATE POLYTECHNICS:

Abraham Adesanya Polytechnic, Dagbolu/Akanran/Ibadan Road.

Atikori, Ijebu-Igbo

Mailing Address: P.M.B. 1020 Ijebu-Igbo,

Ogun State.

E-mail: aap@yahoo.com, aapijebuigbo@yahoo.com

Website: www.aap.edu.ng

Abia State Polytechnic,

Mailing Address: P.M.B. 166, Aba,

Abia State.

Website: www.abiapolyportal.org

\

Adamawa State Polytechnic

Mailing Address: P.M.B. 2146 Yola,

Adamawa State

Website: www.adamawastatepoly.edu.ng

Abdul-Gusau Polytechnic, Talata-Mafara,

Zamfara State.

Akwa-Ibom State Polytechnic, Ikot-Osurua

Mailing Address: P. M.B. 1200, Ikot-Ekpene,

Akwa-Ibom State.

Website: www.akwapolyeduportal.com

Abubakar Tatari Ali Polytechnic

Mailing Address: P. M. B. 0094, Bauchi.

Bauchi State.

Tel: 077-42196, 42548.

Akwa Ibom State College of Arts and Science Nung, Ukim.

Akwa Ibom State

Benue State Polytechnic, Ugbokolo,

Mailing Address: P. M. B. 2215, Otukpo.

Benue State.

Website: www.benpoly.com

College of Administrative and Business Studies, Potiskum

Mailing Address: P.M.B. 1001, Potiskum,

Yobe State

Enugu Polytechnic,

Mailing Address: Ndeaboh Town, Ani-Iri, L.G.A

Enugu State.

Gateway Polytechnic, Igbesa

Mailing Address: P.M.B. 2005, Igbesa, Oba Adesola Market Road,

Igbesa Ogun State.

Tel: 08033044477, 08035690405

E-mail: rector@gatewaypolytechnicigbesa.edu.ng

Website: www.gatewaypolytechnicigbesa.edu.ng

Rufus Giwa Polytechnic,

Mailing Address: P.M.B. 1091, Owo.

Ondo State. Tel: 051-241433

Website: www.rufusgiwapoly.com, www.rufusgiwapoly.net

The Polytechnic, Ibadan,

Mailing Address: P. M. B. 5063,

Oyo State.

Website: www.polyibadan.edu.ng

Institute of Management and Technology, Enugu

Mailing Address: P.M.B. 1079, Enugu.

Enugu State. Tel: 042-251145.

Website: www.imteduportal.com

Imo State Polytechnic, Umuagwo

Mailing Address: P.M.B. 1472, Owerri.

Imo State.

Website: www.imopoly.edu.ng

Jigawa State Polytechnic, Dutse

Mailing Address: Block 40-42, Old Secretariat P.M.B. 7040

Dutse, Jigawa State

Kano State Polytechnic,

Mailing Address: P.M.B. 3401, Kano.

Kano State.

Website: www.kanostatepoly.edu.ng

Hassan Usman Katsina Polytechnic

Mailing Address: P.M.B.2052, Katsina.

Katsina State.

Kogi State Polytechnic, Lokoja,

Kogi State.

Website: www.kogistatepoly.edu.ng

Kwara State Polytechnic, Ilorin,

Kwara State.

Website: www.kwarapolytechnic.com

Lagos State Polytechnic Ikorodu

Mailing Address: P.M.B. 21606, Ikeja.

Lagos State. Tel: 01-523528.

Website: www.mylaspotech.com

Moshood Abiola Polytechnic

Mailing Address: P. M. B. 2210, Abeokuta.

Ogun State.

Website: www.mapolyportal.com

Nasarawa State Polytechnic

Mailing Address: P. M. B. 03, Lafia.

Nasarawa state.

Website: www.naspolylibrary.edu.ng

Nuhu Bamalli Polytechnic,

Mailing Address: P.M.B. 1061, Zaria.

Kaduna State. Tel: 069-334050, 333031.

Website: www.nubapoly.net

Delta State Polytechnic, Ogwashi-Uku,

Mailing Address: Isele-Azagba Road, Ogwashi-Uku.

Delta State.

Website: www.dspgportal.com

Delta State Polytechnic, Otefe,

Mailing Address: P.M.B. 03, Oghara.

Delta State. Tel: 054-340500

Osun State Polytechnic, Iree

Mailing Address: P.M.B. 301, Iree.

Osun State.

Website: www.ospolyiree.com, www.ospolyiree.edu.ng

Osun State College of Technology, Esa-Oke

Mailing Address: P.M.B. 1011 Esa-Oke,

Osun State.

Website: www.oscotech.edu.ng

Delta State Polytechnic, Ozoro,

Mailing Address: P.M.B. 5, Ozoro.

Delta State. Tel: 074-420067

Website: www.ozoropolytechnic.net

Plateau State Polytechnic, Barkin-Ladi,

Mailing Address: P. M. B. 02023, Bukuru.

Plateau State.

Website: www.plapoly.edu.ng

Polytechnic of Sokoto,

Mailing Address: Central Administration Office, Airport Road,

Farfaru, P.M.B. 2356, Sokoto.

Sokoto State. Tel: 060-231364

Adamawa State Polytechnic

Mailing Address: P.M.B. 2146,Yola.

Adamawa State.

Website: www.adamawastatepoly.edu.ng

Ramat Polytechnic,

Mailing Address: P. M.B. 1017, Maiduguri.

Borno State.

Rivers State College of Arts and Science,

Mailing Address: P.M.B. 5936, Rumuola. Port Harcourt.

River State.

Website: www.rivcasonline.com, www.rivcas.org

Rivers State Polytechnic

Mailing Address: P.M.B. 20, Bori.

Rivers State.

Gateway Polytechnic Saapade, Isara.

P.M.B. 2004, Ode-Remo,

Ogun State.

Tel: 0803-334-0118, 0805,642-9014, 0802-325-2570

Website: www.gaposa-ng.com

Edo State Institute of Technology and Management, Usen

Mailing Address: P.M.B., 1004, Benin City,

Edo State. Tel: 08036274056, 08056751398

Website: www.esitmusen.edu.ng

Niger State Polytechnic, Zungeru,

Niger State.

Website: www.polyzungeruonline.com

PRIVATE POLYTECHNICS:

Allover Central Polytechnic,

Mailing Address: Lynson Chemical Avenue,

Off Idiroko Road, P.O Box 1518, Ota.

Ogun State. Tel: 08037707000, 08055204560.

E-mail: alloverpolytechnic1@yahoo.com

Website: www.allovercentralpolytechnic.com

Covenant Polytechnic

Mailing Address: 168 Aba/owerri Road, Aba.

P.M.B. 7065 Abia.

Abia State. Tel: 08055929054, 08055929077

Website: www.covenantpolytechnic.com

Dorben Polytechnic, Bwari-Garam Road

Mailing Address: P.O.Box 590,Garki.

Abuja FCT. Tel: 066-710380.

Website: www.asacs.org.ng

D.S. Adegbenro ICT Polytechnics Lagos/Abeokuta Express Way,

Eruku, Itori-Ewekoro

Mailing Address: P.M.B. 5028 Ifo.

Ogun State.

Fidei Polytechnic, Gboko

Mailing Address: P.M.B. 185, KM 8 Gboko-Aliade Road.

Benue State.

Website: www.fidei-poly.org

Grace Polytechnic,

Mailing Address: 9 Joseph Shyngle Close, Off James Robertson Street,

Alhaji Masha Surulere, P.M.B. 9067 Lagos

Lagos State. Tel: 01-4970455, 960543

Website: www.gracepolytechnic.com, www.gracepolytechnic.net

Igbajo Polytechnic

Mailing Address: P.M.B. 303 Igbajo.

Osun State. Tel: 08033263087

E-mail: Igbojopolytechnic@gmail.com

Website: www.igbajopoly.com

The Polytechnic, Ile-Ife, NITEL Road,

Mailing Address: P. M. B. 009, O. A. U. Post Office,

Ile-Ife , Osun State.

Website: www.thepolytechnicife.com

Lagos City Polytechnic, Ikeja.

Lagos State.

Tel: 01-4970455, 960543.

Website: www.lagoscitypolytechnic.net

Light House Polytechnic, Eubuobanosa, Kilometre 13,

Benin Onitsha Road, Benin City.

Edo State.

Website: www.lighthousepolytechnic.edu.ng

Interlink Polytechnic

Mailing Address: P.M.B. 5060, Ijebu-Jesa.

Osun State. Tel: 02-2020999, 08030660749

E-mail: registry@interlinkpolytechnic.org

Website: www.interlinkpolytechnic.org

Kings Polytechnic, Ubiaja.

Edo State.

Website: www.thekingspoly.com

Our Saviour Institute of Science and Technology Enugu,

Enugu State.

Nigerian Institute of Journalism,

Mailing Address: Lateef Jakande House, 8 - 14, Ijaiye Road,

Ogba Estate, Ikeja.

Lagos State.

RONIK Polytechnic,

Mailing Address: 23-25, Ailegun Road, Off Ejigbo/Egbe Road,

P.M.B. 21764, Ikeja - Lagos.

Lagos State.

Website: www.ronikpolytechnic.com

Temple-Gate Polytechnic

Mailing Address: P.O.Box 3448, Aba Abayi, Osisioma.

Abia State.

Tel: +2348037102981, 0802350396

E-mail: tempegatepoly@yahoo.com

Website: www.templegatepolytechnic.com

Wolex Polytechnic,

Mailing Address: 1 Ogun Street, Adealu Bus Stop,

Lagos - Abeokuta Express Way Dopemu,

P. O. Box 1520, Ikeja - Lagos.

Lagos State.

Website: www.toniksoft.8m.com/WOLEX.htm

Prime Polytechnic,

Mailing Address: Ajaokuta Express Way,

Jida Bassa, Ajaokuta.

Kogi State.

Email: info@primepolytechnic.org

Tel: 07058998691 | 07058799384 | 08188877139

Website:www.primepolytechnic.org

APPENDIX E

PROGRAMMES AVAILABLE IN NIGERIAN POLYTECHNICS

These programmes are currently being offered at National Diploma (ND) - sub-degree level, Higher National Diploma (HND) - degree level and Post-HND - postgraduate professional level in higher technical institutions.

AGRICULTURE AND RELATED TECHNOLOGY

Agricultural Engineering Technology

Agricultural Extension and Management

Agricultural Technology (General Agriculture)

Animal Health & Production Technology

Animal Health Technology

Animal Production Technology

Crop Production Technology

Fisheries Technology

Forestry Technology

Horticulture & Landscape Technology

Pest Management Technology

Soil Science & Technology

Wild Life Management

Wood and Paper Technology

ART, DESIGN AND RELATED TECHNOLOGY

Art and Industrial Design

Fashion Design and Clothing Technology

Printing Technology

Music Technology

BUSINESS AND RELATED STUDIES

Business Administration and Management

Bilingual Secretarial Studies

Cooperative Economics and Management

Human Resources Management

Local Government Studies

Maritime Transport and Business Studies

Marketing

Office Technology & Management

Petroleum Marketing & Business Studies

Production and Operations Management

Public Administration

Purchasing and Supply

Social Development

ENGINEERING TECHNOLOGY

Aircraft Engineering Technology

Boat and Ship Building Engineering Technology

Chemical Engineering Technology

Civil Engineering Technology

Computer Engineering Technology

Electrical/Electronic Engineering Technology

Foundry Technology

Geological Engineering Technology

Industrial Maintenance Engineering Technology

Industrial Safety and Environmental Engineering Technology

Marine Engineering Technology

Mechanical Engineering Technology

Mechatronics

Metallurgy

Mineral Processing Engineering Technology

Mineral Resources Engineering Technology

Mining Engineering Technology

Petroleum Engineering Technology

Petroleum and Gas Processing Engineering Technology

Welding and Fabrication Engineering Technology

ENVIRONMENTAL DESIGN STUDIES

Architectural Technology

Building Technology

Estate Management

Quantity Surveying

Surveying & Geo-informatics

Urban and Regional Planning

FINANCE AND RELATED STUDIES

Accountancy

Banking and Finance

Insurance

HEALTH AND RELATED TECHNOLOGY

Community Health

Dental Technology

Dental Therapy

Environmental Health Technology

Health Information Management

Prosthetics & Orthotics Technology

Public Health Nursing

HOSPITALITY AND RELATED TECHNOLOGY

Hospitality Management

Home & Rural Economics

Nutrition and Dietetics

ND Leisure & Tourism Management

INFORMATION STUDIES

Library & Information Science

Mass Communication

POST-HND (FULL PROFESSIONAL DIPLOMA)

Building Technology

Civil Engineering Technology

Chemical Engineering Technology

Electrical/Electronic Engineering Technology

Mechanical Engineering Technology

Printing Technology

Surveying and Geo-informatics

Urban and Regional Planning

SCIENCE, COMPUTING AND RELATED TECHNOLOGY

Ceramic Technology

Computer Science

Food Technology

Geological Technology

Glass Technology

Leather Technology

Nautical Science

Pharmaceutical Technology

Polymer Technology

PRE-ND SCIENCE & TECHNOLOGY

Science Laboratory Technology

Statistics

Textile Technology

LIST OF NATIONAL INNOVATION DIPLOMA (NID) PROGRAMMES AVAILABLE IN INNOVATION ENTERPRISE INSTITUTIONS (IEIs)

AGRICULTURE AND RELATED SECTOR

Agriculture

Shipping Management

FINANCE, MANAGEMENT AND RELATED SECTOR

Banking Operations

CONSTRUCTION, ENGINEERING AND RELATED SECTOR

Building Construction

Marine Engineering

Welding and Fabrication Technology

CREATIVE ART AND RELATED SECTOR

Cosmetology and Beauty Therapy

Film and Television Production

Music Performing and Media Arts

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) AND RELATED SECTOR

Computer Hardware Engineering Technology

Computer Software Engineering

Multimedia Technology

Networking and System Security

Telecommunication Technology

OIL AND GAS AND RELATED SECTOR

Petroleum Geosciences

PARALEGAL AND RELATED SECTOR

Paralegal Studies

PROFESSIONAL DEVELOPMENT TEACHING AND RELATED SECTOR

Early Childcare Education and Management (ECEM)

SECURITY TECHNOLOGY AND RELATED SECTOR

Security Management and Technology

AUTOMOBILE TRADES

Agricultural Implement Mechanics

Auto Electric Works

Motor Vehicle Mechanics

Vehicle Body Building

BUILDING AND WOOD WORK TRADES

Block-laying, Bricklaying & Concreting

Carpentry & Joinery

Draftsmanship Craft Practice

Furniture Design & Construction

Machine Wood Working

Painting & Decorating

BUSINESS TRADES

Business Studies

Parts Merchandising

Typewriting

Stenography

COMPUTER TRADES

Computer Maintenance & GSM Repairs

Computer Studies

ELECTRICAL/ELECTRONIC TRADES

Appliances Maintenance & Repairs

Electrical Installations and Maintenance Works

Instrument Mechanics

Radio, Television & Electronics Work

HOSPITALITY TRADES

Catering Craft Practice

MECHANICAL TRADES

Fabrication and Welding

Foundry Craft

Marine Engineering

Mechanical Engineering Craft Practice

Plumbing & Pipe Fitting

Refrigeration and Air Conditioning Work

Printing Trades

Ceramics

Graphic Arts

Printing Craft

TEXTILE TRADES

Garment Making

Leather Trades

Textile Trades

GENERAL EDUCATION COURSES

Biology

Chemistry

Entrepreneurship Education

I.C.T

Mathematics

Physics

Economics

Technical Drawing.

APPENDIX F

LIST OF EQUIPMENTS USED FOR TECHNICAL SKILLS ACQUISITION

Cutlass

Hoe

Measuring tape

Chain

Pegs rake

Apparatus

Desiccators

Stop watch

Meter rule

Volt meter

Ammeter

Washing machines

Iron

Vacuum cleaner

Refrigerator

Electric cooker

Pillar drilling machine

Electric stable

Forge hearth

Electric grinders

Black building wire

Drills

Locksmith try squares

Flexible steel rile

Electric drill

Electrified sanders

Electrified circular saw

Tools

Grinding machine

Metal roughing plane

Metal smoothing tool

Stainless steel rule

Screw drivers

Pliers

Socket and plugs

Soldering iron

Circuit breaker

Chisels

Scrapers

Hacksaws

Hammers

Punches

Spanners

Scribers

Pillars

Cutters

Hard and flexible board

Multi-meters

Lead sucker

Soldering paste

Testing lamp

Hand drilling machine

Punchers

Allen key

Torrey driver

Blower

Brushes

Spirit

Magnifying lens

Laptop

Desktop computer

Table lamp

Microscope

Hand glove

Board holder

Adjustable DC power supply

Lamp magnifier

Battery booster

Converter

Forceps

Copper wire

Unlocking kits

Fire station

Software drivers

Signal generator

AC generato

Wonder share Filmora.

Panoptic

Screencast-o-matic

Camtasia Studio

Poll everywhere

Celly

Tegrity

Xtranormal

Primary access

Remind

iPhones.

Digital Devices

Annotation Tool

Avatars

Backchannel Devices

Blogs

Class Calendar

Class Internet Start Page

Class Twitter Account

Class Website

Digital Note-Taking

Digital Portfolios

Dropbox

E-mail

Flipped Classroom

Google Apps

Journaling

Maps

Online Quizzes

Screenshots and Screen casts

Video Channel Virtual Meeting Rooms

Vocabulary Decoding Tools

Collaborize Classroom

Cool Math .

DoSomething.org

Edmodo

Exploratorium

First in Math

Fun Brain

Hippocampus

HowStuffWorks iCivics

Melody Street

MyBackPack

PowerSchool

Raz Kids .

Scholastic Kids Press Corps .

Schoology

Scratch

Spelling City

Starfall

Weebly

3D painting

Cloud computing

Online social networking

Flexible displays

Biometric; Eye tracking

Multi touch LCD screens

Game bases learning

Infographic.

App Smash

Hyperlapse

Movie

Garageband,

Google Classroom

Google Drive