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The Perceived Adequacy of Vocational and Technical Education in Nigeria and the Administrative Problems in Staffing the Programs

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THE PERCEIVED ADEQUACY OF VOCATIONAL AND TECHNICAL EDUCATION IN NIGERIA AND THE ADMINISTRATIVE PROBLEMS IN STAFFING THE PROGRAMS

A Dissertation

Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

by

James Dele Owolabi

May 1995

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ABSTRACT

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by

James Dele Owolabi

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ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

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Title: THE PERCEIVED ADEQUACY OF VOCATIONAL AND TECHNICAL EDUCATION IN NIGERIA AND THE ADMINISTRATIVE PROBLEMS IN STAFFING THE PROGRAMS

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Problem

This study was to examine the perceived adequacy of technical education in Nigeria and the problems that administrators face in staffing the programs.

The aims and objectives of technical education were examined as written in the Fourth National Development Plan and National Policy for Education.

Method

Two instruments were utilized for data collection: (1) a survey questionnaire for the opinions of Nigerian technical educators, and (2) a set of structured questions to interview selected executives in industry. The

researcher travelled to Nigeria's technical institutions for distribution of questionnaires and for on-the-scene assessment of technical programs.

Collected data and government publications were analyzed. The questionnaire covered goals and objectives, nature and scope, grade placement, laboratory facilities, competencies, funding, staffing, responsiveness of curriculum to intended objectives, and the overall rating of programs. Responses of the interviewed industrialists were also analyzed.

Findings and Conclusions

National aims and objectives were clearly defined, but the quality of education has declined because of enrollment increases, shortages of qualified teachers, textbooks, funds to run expensive programs, and the unavailability of physical facilities and teaching aids. Ninety-three out of 95 (97.9%) technical educators rated the overall Nigeria technical education programs as inadequate. Coordination and management of technical education programs were also rated inadequate.

The curriculum has been too theoretical in nature. Curriculum development has occurred without the input of industry, community, and curriculum specialists. There has been lack of administrative support, proper planning, and management of resources. The remuneration for teachers has been poor; excellent teachers have not been rewarded. The

number of available industries has not been enough for students' industrial attachment. The quota system of allocating resources has been inadequate. Many graduates have not been employed and those employed are working in areas other than which they are qualified.

To
my loving, caring,
and warm-hearted mother,
Comfort Egberongbe Owolabi,
who lived her life for her children
and strongly believed in our education,
who put a gleam on my face
and joy in my heart.

TABLE OF CONTENTS

APPENDIX

LIST OF TABLES

LIST OF FIGURES

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CHAPTER 1

INTRODUCTION

The Federal Republic of Nigeria is situated in the continent of Africa between 3 degrees and 14 degrees East Longitude, and 4 degrees and 14 degrees North Latitude. The country is bounded on the west by the Republic of Benin and Niger; on the east by Cameroon's Republic; on the north by Niger and Chad Republics, and on the south by the Gulf of Guinea (Annual Abstract of Statistics, 1988, p. 1) It has an area of 923,769 square kilometers, and the latest 1988 mid-year population of Nigeria was about 112 million people. With a population growth rate of 3.3% per annum, Nigeria is not only the most populous country in Africa but also a country with the highest annual population growth rate (First National Rolling Plan, 1990-92, p. 246).

After almost a 100 years of British Colonial rule, Nigeria gained her independence on October 1, 1960. Nigeria was regarded by the Western world as the "most hopeful and stable country in Africa" until the state of affairs changed in 1966. The chain of political crisis into which Nigeria was plunged soon after independence culminated in the election crisis in the western states. Polling agents were killed and more than 300 people were

arrested for election offenses (Motunde, 1965). The disagreement on the results of the election among the political parties and elected candidates signaled for a complete breakdown of law and order. Rioting broke out across the length and breadth of the western region. Murder, looting, arson, and violence of all kinds were rife. Attempts by the Commonwealth Prime Ministers Conference to help find a solution to the crisis were thwarted. This was the background to the rebellion of the army officers, which profoundly changed the fate of the Nigerian Federation. Amid widespread charges of killings in the 6 months after the election, there were suggestions that Nigeria's armed forces should restore order. In January 1966, army officers seized power in a bloody coup. The army commander vowed to stamp out corruption and to suppress violence.

Throughout the remainder of 1966 and into 1967, there was more tribal violence in the northern parts. The coup was perceived not so much as an effort to impose a peaceful government as a plot by the Igbo to dominate Nigeria. In September 1966, attacks on the Igbo by the Muslim traditionalists in the north led to tribal divisions in the army and eventually into a secession attempt by the Eastern Igbo. A new Republic of Biafra was named and the principal cause cited for secession was the Nigerian government's inability to protect the lives of

the Eastern Igbos. This led to the civil war to keep Nigeria under one nation.

As a result of the civil war, there was a shortage of food supply. "Operation feed the nation" and "green revolution" were launched. The positions vacated by the expatriates and foreign technicians before and during the war clearly showed that there were few Nigerians who had technical and vocational qualifications.

At the end of the civil war on January 12, 1970, the Military Government of Nigeria developed a national plan for reconstruction, rehabilitation, and redevelopment of the war-affected areas. Among the nine-point program that would enable the military to relinquish control were implementation of a national economic development plan, reconstruction of war-damaged areas, and an introduction of a formula for allocating revenues. Development plans were drawn:

> Since its independence, Nigeria has drawn up four national development plans. These plans were intended to further the process of establishing a solid base for the long term economic and social development of Nigeria. It emphasized key sectors such as agriculture, particularly food production, manufacturing, education and manpower development and infrastructural facilities. Social services, particularly housing, water supply and health are also emphasized as a means of effecting immediate improvement in the quality of life in Nigeria (Fourth National Development Plan, p. 1).

The first and second plans covering 1962/63-1967/68 and 1970/71-1973/74 envisaged capital expenditures of N2.2 billion ($0.88 million U.S.), and N3.2 billion ($1.28

billion U.S.) respectively. The third plan 1974/75-1980 which had an original size of N30 billion ($12 billion U.S.) was revised upwards to about N43.3 billion ($17.32 billion U. S.). By every measure, this represented a very large jump from the previous plans. The Fourth National Development Plan (1981-1985) which was launched in 1981 envisaged a program of N82 billion ($32.8 billion U. S.). At the time of these development plans $1 was equivalent to N2.5. The Plans were developed prior to the collapse of the international oil market. With the discovery of crude oil (petroleum), these plans were to be funded by the sale of crude oil and its by-products. The human resources problems of the country was becoming more complex.

Fafunwa (1974) stated:

> There was an acute shortage of trained indigenous personnel to undertake feasibility studies, evaluate development projects, determine what projects would best further Nigeria development, formulate viable development programs and manage and supervise the implementation of projects. (p. 298)

The discovery of crude oil (petroleum) and the lack of trained and skilled technicians to work on the sites added to the importance of vocational and technical education. The progress made in the 1960s in the training of technicians and artisans was short of the needs of the country. Finding ways of enhancing the value placed on vocational and technical education by individuals and society was therefore one of the greatest challenges facing

Nigeria in attempting to implement the broad objectives of vocational and technical education.

The educational system inherited from the colonial government, unquestioned by the majority of the people prior to and at the time of independence, has already begun to give way to a completely new design to satisfy Nigeria's economic needs (Fafunwa, 1971). The national priority was on education, particularly on science and technology as a means of development and progress, and meeting the manpower needs through training in Nigeria's institutions as well as in the Western world. However, the educational system accorded low priority to vocational and technical education.

In 1981, Nigeria had 19 states when the educational policy statement referred to in this study was written, and the crude oil economy was flourishing. In 1994, there were 30 states in the Federation. Each new state was agitating for equal shares of the national development based on a quota system formula adopted for allocating revenue. The states' requests were granted with the establishment of more schools and tertiary institutions in each state. The onset of recession in the late 1970s brought in its wake a downturn in the national economy. As the nation's economic resources dwindled, it became difficult for the government to adequately meet the financial needs of all the sectors of the economy. Not the least affected was the education sector which had

witnessed massive expansion in terms of student population and infrastructural facilities during the oil boom. Consequently, standards fell as available resources were no longer sufficient to maintain these facilities.

Nigeria's technological backwardness is, to a considerable extent, a direct result of the educational system which the country inherited from the British colonial administration, namely, a system which was strongly biased towards literary education at the expense of technical training and skill acquisition (Penrose, 1976).

The concern continues for the perceived adequacy of vocational and technical education programs in Nigeria as it affected the national search for a technological base. The space-age knowledge explosion was technical in nature, and this carried the implication that a country needed technical capabilities to benefit from it. Nigerians have come a long way from the colonial educational period to have placed nationally the importance of technical education above literary education and have substituted technological achievement as the real symbols of progress.

The Federal government of Nigeria has adopted education (prioritized vocational and technical education) as an instrument par excellence for effecting national development. The problems that Nigeria faces are whether the existing vocational and technical education program is adequate and/or appropriate to meet the intended aims and objectives of technical education in the country, and

whether there are enough teachers properly trained to handle the programs.

Statement of the Problem

This study examined the status and perceived adequacy of vocational and technical education programs in Nigeria. Specifically this study was conducted to:

1. Outline the intended objectives of vocational and technical education as prioritized by the Federal Government of Nigeria in the Fourth National Development Plan (1981-1985) and the National Policy on Education (1981 revised edition);

2. Examine to what extent the vocational and technical education program in Nigeria is adequate in meeting the intended objectives as perceived by selected vocational education administrators and teachers;

3. Determine if there are differences in the perception of adequacy between administrators and lecturers of vocational and technical programs;

4. Examine if the perception of adequacy is related to the size (population) of institution;

5. Examine if the perception of adequacy is related to the type of institution.

Rationale for the Study

The low priority accorded to vocational and technical education from the colonial era has had an impact

on the development and progress of vocational and technical education programs in Nigeria.

Consequently, there is scarcity of qualified and competent teachers in Nigerian vocational and technical institutions. There are difficulties securing Nigerian instructors who are academically qualified and professionally competent, and willing to serve in these institutions. The disparity among the states called for some distinctions in strategy. There is widespread manpower shortages and educational lag in the newly created northern states, which called for educational expansion programs. At the same time, the improvement of the southern states' existing educational establishment also called for concerted teacher education effort. Thus, vocational and technical teacher education and certificate standardization deserved high priority in both the northern and southern states.

The real problem was not technical change but the human changes that often accompany technical innovations. Economics, politics, training, sociology, and ecology affect the rate and importance of technological progress, while education can determine what needs to be done. Regarding the human problem, changes need to come from administrative implications such as policy and planning, administration and management, financing and cost effectiveness. These factors weighed heavily on vocational and technical program needs and students' competencies outcome. Viable and sound structures, properly coordinated, are of importance if

appropriate policies for vocational and technical education are to be set and implemented through realistic planning and management. The national frameworks for the vocational and technical programs should have a reliable foundation. The various parts of the foundation must be coherent. The structure should serve its purpose and the values of the society for which it is intended. Otherwise, it will either fall apart or be abandoned.

The Federal and State governments took steps to promote and ensure the success of the national campaign on mass literacy. Enrollment in all institutions of learning increased as a result of the rapid expansion of the entire educational system. The excessive demand for education led to indiscriminate establishment of institutions at all levels during the civilian era in an attempt to score political points. As a result of this rapid expansion, the supply of qualified teachers was inadequate, and physical facilities as well as necessary teaching aids and other equipment were in short supply (Adeyemi, 1992).

Federal Ministry of Education Research studies conducted in 1986 have shown that there is a scarcity of qualified and competent teachers in Nigerian vocational and technical institutions, and the effort of the Federal Government and that of the institutions to meet the manpower need of the job market is inadequate and/or inappropriate.

There are difficulties in securing Nigerian instructors who are academically qualified, professionally competent, and willing to serve in these institutions.

In 1989, the vocational and technical education system was re-scrutinized. The result of this reappraisal of the system was evidenced in the various commissioned vocational and technical education study groups appointed by the Federal and State Governments, and other national and foreign interest groups such as the Ten-Year Plan of Development and Welfare Commissions on Higher Education in 1946, the Ashby's Commission on Technical Education in 1960, and, of notable importance, the National Commission for Colleges of Education, Minimum Standards for NCE Teachers in Vocational and Technical Education, which was approved on the 27th of November, 1990. This Commission laid down minimum standards for all programs of teacher education and accredits their certificates and other academic awards after obtaining approval of the Minister. The Commission approved guidelines setting out criteria for accreditation of all Colleges of Education in Nigeria.

Miller (1985) stated:

> Teachers are the most important and critical element in vocational education. The values, skills, professional knowledge, experience, and human relations factors that a teacher possesses largely determine the quality of learning opportunities that occur in the name of vocational education. The pedagogy of vocational education should differ widely from that evolved for liberal education, especially with respect to making participation in productive work a fundamental element. (p. 81)

Teachers remain a critical feature of the technical education endeavor in Nigeria. Teachers are the fulcrum for creating learner options. Foremost among the responsibilities placed on technical teachers is that of indeed being technically and pedagogically competent. Newcomb (1979) reasoned that vocational and technical teachers must possess pedagogical competence in the art and science of teaching. Teachers who are highly knowledgeable and skilled in their technical areas, but who do not possess a high level of pedagogical competence, are fulfilling only a part of the requisites for being good teachers. Technical teachers must be both technically and pedagogically competent.

Significance of the Study

A study like this is needed in Nigeria as a basis for understanding and identifying the problems associated with the administration of vocational and technical educational programs.

For the country to be able to achieve the aims set out, and in order to derive maximum benefit from Nigeria's investment in education, it will be necessary to improve the operational efficiency of the system through better utilization of the administrative and teaching staffs. To enhance the achievement of the objectives of vocational and technical education in Nigeria, (1) a priority should be given to the recruitment and preparation of adequate numbers

of well-qualified and competent teachers, administrators, and guidance staff; and (2) the necessary training and facilities should be provided to enable them to function effectively in their profession as suggested or recommended in this study.

This study hopes to contribute to finding a viable solution to the problems of the inadequacy and/or inappropriate vocational and technical education programs by making suggestions and recommendations of this study available to the Federal Ministry of Education, vocational education administrators, teachers, and the learners. Thus, proper needs survey, student interest, community needs, and industrial manpower needs are the basic considerations for establishing a vocational program; vocational programs should be designed in accordance with the overall social and economic requirements of local or national development.

The results of this study may be useful to vocational education planners, vocational scholars, and the administrators in the Ministry of Education at the Federal, State, and local levels. The results of this study may be useful for the National Board for Technical Education, and the National Commission for Colleges of Education in the planning, development, implementation, and improvement of vocational and technical education if the suggestions and recommendations made in this study are considered and utilized. In Nigeria's rapidly changing technological

society, needs must be frequently reassessed and program goals and objectives redefined to reflect new conditions and new priorities so that the barriers and facilitator of vocational and technical education in Nigeria could be updated and improved.

At the formal inauguration of the Governing Board of the National Commission for Colleges of Education on the 19th of April 1989, the former Minister of Education, Professor Jibril Aminu, posed a challenge to the commission on minimum standards for NCE teachers in vocational and technical education. The Honorable Minister said:

> In all your dealings with the institutions, whether it be over funds, or accreditation or the establishment of new units, or whatever, you should be fair but firm. We cannot compromise on accountability and poor quality in teacher education. It will be a national disaster, which we must avoid by insisting on only the best. Humanitarian or political kindness to any institution or program may eventually prove costly to the nation. (p. i)

Education must impart general knowledge and a broad-minded attitude to the population as a whole, and it must produce creative specialists in various areas of human activity.

Definition of Terms

The following terms used in this study were intended to convey the meanings given below.

Adequate: For the purpose of this study, adequate means that it is proportionate; fully sufficient; meeting

the expected aims and objectives of technical education programs as written in the National Policy on Education (1981) and the Fourth National Development Plan 1981-1985.

College of Technology: A post-secondary institution offering a 3-year program in many branches of technology and related disciplines at the professional and subprofessional levels. It is set up to train manpower not usually produced from the university. Graduates of the institution are expected to lead in the fields of industrial technology. Graduates receive the institution's diploma and are qualified to take examinations for the award of other recognized external certificates and licenses (West Africa Journal of Education, 1973, p. 151).

Expatriate: A foreign national who has given up residence in his/her homeland to reside abroad and is regarded as an expert with a high degree of skill in knowledge of subject, technical field, or career.

Inadequate: For the purpose of this study inadequate means insufficient; not meeting the expected aims and objectives of technical education programs.

Industrial attachment: An activity in which pupils in occupational programs of studies spend a portion of their time in supervised employment (i.e., on-the-job training) in business or industry. This activity is referred to as cooperative work experience.

National Board for Technical Education (NBTE): Decree 1977 No. 9 established a body by the Federal

Government of Nigeria to advise the Military Government on, and to coordinate-ordinate all aspects of, technical and vocational education falling outside the Universities.

National Certificate of Education (NCE): The diploma or certificate awarded to the graduates of Nigerian Colleges of Education.

Polytechnic: An institution set up to provide for studies, training, and development of techniques in applied science, engineering, and commerce as well as in other spheres of learning. Polytechnic provides courses of higher education mainly at the intermediate level of manpower, leading to diploma and other awards at a comparable level, offered as appropriate, on a full-time, sandwich, or part-time basis. University-bound students are also prepared at Polytechnic (Polytechnic Staff Handbook, 1986, p. 6).

Quota system: Nigeria's system of proportional sharing, assigning to, or allotment to a State or region as of federally or nationally owned goods, revenue allocation, disbursement of scholarships, employment in the ministries, and federal establishments, admission of candidates into the federal colleges and universities for equal number or proportion or opportunity.

Structural Adjustment Program (SAP): An economic program, covering the period July 1986-June 1988, with the objective to redress the basic structural imbalances in the economy, halt its downward slide, and establish a base for

non-inflationary growth and in-place policies and programs that will see the emergence of a dynamic market-oriented economy (National Rolling Plan, 1990-1992, p. 1).

SIWES: Supervised Industrial Work Experience Scheme; an industrial experience arrangement made with an industry in a related occupational program where pupils are spending a portion of their training in a supervised employment.

Technical education: That body of knowledge organized in a planned sequence for classroom and laboratory experiences, usually at the post-secondary level, to prepare pupils for a cluster of job opportunities in a specialized field of technology. The program of instruction normally includes the study of the underlying sciences and supporting mathematics inherent in a technology, as well as methods, skills, materials, and processes commonly used and services performed in the technology (State Educational Records and Reports Services, 1980).

Vocational education: A program designed to prepare individuals for gainful employment as semi-skilled or skilled workers, technicians. and sub-professionals in recognized occupations and in new and emerging occupations, or to prepare individuals for employment in occupations generally considered professional, or that require a baccalaureate or higher degree (Strong & Schaefer, 1975). Note: Quite often in literature, "vocational" and "technical" are used synonymously or interchangeably since

they are professions involving the same principles. This is the case in this study.

Limitations

This study was limited to the documents retrieved from the Federal Republic of Nigeria on the Fourth National Development Plan 1981-1985, the National Rolling Plan 1990-1992, publications of the Federal Office of Statistics, Lagos; and the documents of the Federal Ministry of Education, Technical Section in Lagos.

The American Vocational Association (1985) questionnaire on the issues of vocational and technical education in the United States was modified to produce the needed information on the status of vocational and technical education in Nigeria.

All statistical data used in this study were the only available updated information as published in the National Rolling Plans from the Federal Ministry of Budget and Planning, Lagos (1991-1993), Federal Office of Statistics, Lagos, in the Federal Republic of Nigeria, Digest of Statistics, December 1989 edition, and Annual Abstract of Statistics, 1988 edition. Most of the information collected from 1985-1989 was when Nigeria had only 19 states in the Federation. New states have been

created to make a total of 30 states and a new Federal Capital Territory has been built in Abuja.

The terms vocational and technical education are used together in this study because the educators surveyed were selected from a combination of vocational and technical education institutions. Both programs are under the same director in the Federal Ministry of Education organizational chart.

Delimitations

This study utilized the results of the data collected from the survey questionnaire for the opinion of Nigerian technical educators and a set of structured questions used to interview purposefully selected executives in industry in Nigeria.

The educator population was limited to the administrators, teachers, and staff members of the Federal Ministry of Education Technical Section; Federal College of Education (Technical); Government Trade Center, Yaba; and Colleges of Technology and the Polytechnic Institutions in Nigeria.

Organization of the Study

Five chapters are contained in this study. Chapter 1 covers the introduction to the background of the problem. It also presents the statement of the problem, rationale, significance of the study, definition of terms,

limitation, and organization of the study.

Chapter 2 presents the review of literature, the theory and survey of needs, historical development of education, the cradle of vocational education, recommendations of different commissions on vocational and technical education, policies and administration of education, technical and vocational teachers' education, resources, international assistance, financing of technical education, and the types of vocational and technical education in Nigeria.

Chapter 3 describes the methods and procedures, introduction, research design, population and samples, procedure, development, and administration of the instrument, and data analysis.

Chapter 4 is the analysis of findings. It also contains analysis of data collected from the technical educators and selected executives in industry.

Chapter 5 presents the summary, conclusion, and recommendations of this study.

CHAPTER II

REVIEW OF LITERATURE

Introduction

I reviewed the literature concerning aspects of vocational and technical education in Nigeria that were useful in examining the perceived adequacy of these programs and problems regarding staffing. The aims and the objectives of vocational and technical education are quoted as written in the National Policy on Education and in the Fourth National Development Plan. Several sources and bibliographies were used to review literature on the topic. Books, journals, periodicals, and dissertations were some sources of reviewed literature. The materials used were selective and were organized around the following topics to provide a conceptual background for the study and the need for vocational and technical education in Nigeria for development and advancement of her citizens.

The topics are:

1. Historical development of vocational education
2. Policies and administration of education
3. Financing vocational and technical education
4. Ashby Commission's reports and recommendations

5. Resources

6. International assistance

7. Types of vocational and technical education.

Historical Development of Vocational and Technical Education

Pre-colonial Vocational Education in Nigeria

Educational development in Nigeria began with the colonial rule and served as the Christian missionaries' means of propagating the gospel messages to the natives. Before the missionaries' arrival in Nigeria, there had been a formal educational system in different parts of Nigeria. Nwokocha (1984) in A Survey of Selected Research on Vocational and Technical Education in Nigeria wrote:

> The Moslems in the Northern part of the country had a formal educational system where a number of pupils attended religious classes to study the Koran in order to gain literacy in Arabic. By 1913, there were some 19,000 Koranic schools with about 135,000 students. (p. 16)

Fafunwa (1974) in History of Education in Nigeria also wrote:

> The first major recommendation of the introduction of technical and vocational education was made in 1945 when the Commission on Higher Education in West Africa proposed that the premises of the defunct Yaba Higher College should be converted into a technical Institute.
>
> Fafunwa (1974) wrote further that, technical and vocational education in one form or another was in vogue before the introduction of Western education to Nigeria where in the various skills of wafts are done and taught

> such as weaving, blacksmithing, carving, farming, dress making, pottery making etc. The Ashby recommendations gave an incentive to technical and vocational education. Regional craft schools were established. (p. 176)

Nwagbaraocha (1978) in Education In Nigeria 1900-1970's found that vocational education in pre-colonial Nigerian society and in the traditional Nigerian society could be divided into three types:

> 1. Agricultural education which includes farming, fishing, and veterinary science (animal care and animal rearing), plant rearing.
>
> 2. Trades and crafts comprises smithing (black, gold, silver, and tinkers), hunting, weaving (baskets and cloths), painting and decorating, carving (wood and bronze), sculpting, carpentry, building, dress making, soap making, dyeing, esusu collecting (banking), di-oci (palm-wine tapping), and rope making.
>
> 3. Professions include medicine, priesthood, divining, Amala (administration and government), Oji-ofo chiefs and (village heads). In pre-colonial and contemporary Nigeria, the overwhelming majority of the population practices subsistence farming. Until the oil boom in Nigeria, more than eighty percent of the economy depended on agriculture. (p. 10)

There is abundance of arable land for cultivation at one's request: this is why traditional education in farming excels in Nigeria. At an early age a child is assigned his portion of land for cultivation.

Traditional farming or agriculture may not be

technologically advanced, but it calls for the mastery of some specific skills requisite to be successful in subsistence farming: clearing and burning the debris to serve as a manure; ploughing and tilling the soil; seed preparation, selection, and planting; crop rotation as a means of manure; tendering, hoeing, and harvesting; storing and preserving crops; determining the seasons and weather conditions; the knowledge of quantities, weights, and money exchanges.

These are the aspects of farming that a child learns at different stages of his growth and as the seasons dictate in farming operation. Serving his apprenticeship under his parents, he continues to grow and develop under his father's roof until marriage or whenever the father feels he can stand on his own.

Christian Missionary and Nigerian Education

Western forms of education were introduced in Nigeria by the Christian missionaries in the mid-18th century because of their special interest in tropical Africa.

Historically, there was vocational and technical education in one form or another in Nigeria before the introduction of a Western form of education. There were apprenticeships in various trades and crafts, agriculture, and professions such as blacksmithing, goldsmithing,

silversmithing, weaving, dressmaking, carving, sculpturing, pottery making, medicine, Ifa-oracle, farming, fishing, and animal rearing.

The Western form of education came to Nigeria through Christian missionaries in the mid-18th century. The missionaries started mission schools to replace cultural apprenticeships in a particular practice. They contributed much toward the religious and literary education of Nigerians by teaching the church leaders writing, personal hygiene, Western history, European geography, and how to read the Bible. Missionaries did not get themselves involved in the provision of technical education to propagate their religion. Technical education was more expensive than other fields of education because of the facilities and equipment required. Vocational and technical education was accorded a low priority because it was meant for the poor students and those with dull minds. Education in Nigeria was conceived largely as purely literary education. Many Nigerians ignorantly believed that a literary type of education was the only ladder to achieve success. For almost 100 years in Nigeria the educated were those who read classics--Latin, Greek, Milton, and Shakespeare. Technical and vocational education was not given any serious attention during the missionary era in Nigeria--it was either abandoned or ignored. Ajayi (1965) reported that the Roman Catholic mission introduced the industrial form of education into Nigeria in 1876. The

industrial school participants concentrated their manual activities on agriculture, especially planting and harvesting. This education was not as a part of normal education for children, but partly for profit and as a reformatory training. There were few vocational and technical institutions because of the poor image of the trainees and the profession.

Agboola (1987) in History of Christianity in Nigeria-Seventh Day Adventists 1914-1964 wrote:

> Christianity entered Yorubaland during the fifth decade of the nineteenth century. The first Christian missions were the Methodists in Abeokuta in 1846 and the church missionary society (CMS) in 1843. By 1860 the American Baptists came. The Roman Catholic mission (RCM) came in 1868. It was clear that Yorubaland was already a Christian mission field by the arrival of the Seventh Day Adventist missionaries in Nigeria in 1914. (p. 1)

Coleman (1958) in support of Agboola also wrote:

> Between 1842 and 1868, each of these denominational missions had built its own churches and schools to teach Nigerians how to read, especially the Bible, and to write. The church leaders also taught personal hygiene and sanitation, western history and European geography. (p. 114)

Most of the earlier works on Nigerian education have been centered on historical, cultural aspects, or on the missionaries.

Nwokocha (1984) found that the early missionaries in Nigeria

> enforced a certain moral tone and built an emphasis on character training. European code of ethics and management boards were set up to help regulate each mission's religious curriculum, as well as the teacher's salaries and conduct. These mission schools taught singing, scripture, spelling, writing and arithmetic. (p. 17)

Fafunwa (1974) stated: "Up to 1882, the Colonial Government in Nigeria paid little or no attention to the educational needs of the people and the field was left entirely to the missions" (p. 92).

The missionaries and the colonial rulers in Nigeria were very cautious. Fajana (1978) in Education in Nigeria 1842-1939: A Historical Analysis wrote:

> Historically the Christian missionaries contributed much toward the religious and literary education of Nigerians, but did very little to get themselves involved in the provision of the technical education needed by the people. (p. 165)

The missionaries controlled 99% of the schools, and more than 97% of the students in Nigeria were enrolled in mission schools.

Fafunwa (1974) reported that "between 1870 and 1976 the colonial government in Lagos made spasmodic attempts to assist some of the missions in their educational work" (p. 93). This was done to meet the missionaries' need for teachers and preachers who would interpret for them and also to meet the colonial government's need for clerical workers.

Coleman (1958) stated:

> Most of the mission schools' educational emphasis

> was on literary education, because literary education cost the missionaries less than technical and agricultural training. It was used as a means of converting and attracting people to the church. The Government too was indifferent toward education as a function of the government. (p. 131)

Fafunwa (1971) wrote:

> One of the major defects in the Nigerian educational system is the low priority accorded to technical and vocational education. As in most former British colonial territories, education in Nigeria was conceived largely as purely literary education. The phrase 'men of the book' had double meaning, in one sense it referred to 'Bible men' (in the mid-nineteenth century) and in another sense it referred to 'men of literature' (in the mid-twentieth century).
>
> For almost a hundred years in Nigeria the educated men were those who read classics -- Latin, Greek, Milton and Shakespeare. Indeed most of Nigeria's early scholars were noted for their literary erudition.
>
> The first Western schooling brought to Nigeria was a literary education, and once civil rule was established the expatriate administrators were graduates, most of them in arts. And so the literary tradition and the university degree have become indelible symbols of prestige in Nigeria; by contrast, technology, agriculture and other practical subjects, particularly at sub-professional level, have not won esteem. It is small wonder, then, that training for qualifications other than degrees, especially in technology, is not popular. (p. 175)

Nwokocha (1984) wrote that "by the late 1960s, literary education was largely seen as having been a one-sided system of education during the colonial period, in both the government and the missionary schools" (p. 22). Since some Nigerians 'made it to the top' through literary education, many people

ignorantly believed in this type of education as the only ladder to achieve success. Many embraced this type of education without questioning the quality or the kind of education offered in the schools. Technical and vocational education was not given any serious attention during the missionary era in Nigeria--it was either abandoned or ignored.

The Cradle of Vocational and Technical Education

The practice of having an employee do practical work related to the employee's department (or other department he might have been assigned) was the extent of technical training to which a few people were exposed during this period. Government departments such as Public Works and Maintenance Department handled most of the jobs under this description.

Ajayi (1965) in Christian Missions in Nigeria 1841-1894: The Making of New Elite wrote:

> In contrast to literary education, in 1876 the Roman Catholic mission introduced the industrial form of industrial form of education in Badagry. The industrial school participants concentrated their manual activities on agriculture, especially coconut planting and harvesting. The chief aim of the industrial training according to Ajayi, was not as a part of the normal education of children, but partly for profit and as a reformatory training (p. 30).

Fafunwa (1974) mentioned:

Some of the mission schools in the last

> century introduced farming, bricklaying, and carpentry as part of the curriculum but these skills were not seriously regarded by pupils and parents as an integral part of western education. This practice virtually died out before the turn of the century, except for the Blaize Memorial Industrial school in Abeokuta, founded by some Nigerians and West Indians, and the Hope Waddell Institute in Calabar established by the C.M.S. in 1895. The establishment of courses in the various government departments such as in the Nigerian Railways, Marines, Public Works etc between 1908 and 1935 marked the beginning of organized technical and vocational education in Nigeria: These were followed by the engineering courses at the Yaba Higher college in 1932. (p. 176)

In addition to the various government departments in the early 19th century, a number of the larger industrial firms, the U.A.C., the U.T.C., Shell-B.P., and corporations like the Post and Telegraphs, Printing, and Leventis, have technical schools in which they train artisans in their respective industries.

Government departmental training schemes were inaugurated as follows: Marine, 1928; Land Survey, 1908; Public Works, 1931; Post and Telegraph, 1931; Railway, 1942. The combined output of these schemes up to 1945 was about 300 artisans and craftsmen.

Olaniyi (1988) wrote:

> By the time of the demise of the Second Republic, Nigeria was still very much a consumer of foreign technology, rather than a manufacturer of machinery and equipment, a realization which "embarrassed" the succeeding administration and spurred it into action. (p. 224)

Socio-economic pressures pushed Nigeria forward

toward social-transformation; then arose numerous problems of government, economic, education, industrial, social, health, and transportation into the hinterlands. These new burdens led to the Ten-Year Development and Welfare Plans in 1946 by the Commissions on Higher Education. It was the first comprehensive educational development plan in Nigeria. This plan was designed to expand education, industries, health, communications, transportation, power generation, and agriculture in the country.

The colonial administration was blamed by the commission for its neglect of vocational and technical education in Nigeria.

The commission reported:

> Nigerian society has become totally unbalanced. It has professional men and clerks but lacks the intermediate category of self-respecting artisans which is to be found in every highly developed country. (p. 38)

The Ten-Year Plan of Development and Welfare for Nigeria (1946) states:

> The commission recommended the expansion of vocational and technical education and training programs in Nigeria so as to meet the Nigerian labor market needs for technician and craftsmen. In response to the commission's recommendations the government provided a 400,000 British Pounds sterling grant under the Colonial Development and Welfare Plan for the expenditure during the first five years. (p. 38)

Ukeje (1966) reported that "in 1947 Yaba

Technical Institute was established. By 1952, two other technical institutes were opened in addition to Yaba Technical Institute in Enugu and Kaduna respectively, including seven trade schools and eighteen handicraft centers" (p. 98).

Ashby Commission Reports

Taiwo (1981) wrote that "the Ashby recommendations gave a fillip to technical and vocational education" (p. 142)

Sir Eric Ashby was the chairman of the commission appointed by the Federal Ministry of Education to review the structure and organization of higher education in relation to Nigerian manpower needs. The Ashby Commission was comprised of selected British and Nigerian educators and was set up at a time when Nigeria was approaching her independence in 1959. This commission was mandated to make recommendations for the expansions of post-secondary schools and higher education facilities in Nigeria for the years 1960-1980.

Based on the recommendations of the Ashby Commission, the Federal Government of Nigeria endorsed a proposal that (1) demanded the integration of manual training and handicraft lessons in primary school curriculum and (2) expanded teacher-training colleges and the Nigerian technical teacher colleges to produce large numbers of teachers for the nation.

Ashby Commission's Recommendations

The Commission (Ashby, 1960) reported on technical education:

> We have already drawn attention to what we consider to be a major defect in Nigerian Education, namely, the strong bias towards the traditional literary and academic subjects. This is reflected in a lack of respect on the part of the public for manual skills and technical achievement. We strongly believe that the most effective ways of correcting this would be to introduce a manual subject as an obligatory ingredient of all primary and secondary schooling, not as a vocational training, but because such subjects have educational value which entitles them to a place in general education. (p. 18)

Investment in Education (1960) on estimation of Nigeria's high-level manpower needs suggested that technical institutes should provide general commercial subjects at a full-time post-secondary level to upgrade students already in employment and offer a similar program at a part-time day release to intermediate staff for technical and commercial establishments (p. 20).

There should be an increase in vocational and technical training, and the expansion of vocational and technical facilities at both primary, secondary, and post-secondary school levels (Educational Development 1961-1970 Federation of Nigeria Sessional Paper #3 1961, p.16).

Below are the recommendations made by the Harbison's Commission members (1960):

> Our report rests upon three foundations: our conception of Nigeria in 1980, Harbison's estimates of Nigeria's needs for high-level manpower by 1970, and our estimates of the present capacity of the educational system. Our recommendations aim at two objectives: (1.) to upgrade Nigerians who are already in employment but who need further education; (2.) to design a system of post-secondary education which will, as estimated according to need; and to design it in such a way that it can be enlarged, without being re-planned, to meet Nigeria's needs up to 1980.
>
> The Commission further recommended the correction of the bias of the primary and secondary school curricula toward literary and academic subjects. They suggested the introduction of obligatory manual subjects.
>
> They also suggested that in some secondary schools, technical subjects should be included in among those which might be carried to School Certificate level. In respect to girls' secondary schools, the Commission recommended the provision of a one-year, Post-School Certificate commercial course to prepare the girls for secretarial employment. They also proposed that vocational agricultural courses be offered by some boys' schools. (pp. 16-21)

On the issue of technical and vocational education, the Harbison's Commission made the following recommendations (1960):

> Plans should be made for the development of post-secondary courses for the training of technicians in some half dozen technical institutes, building up to a flow of about 2,500 per annum. For the next ten years, the Institute at Enugu, Ibadan, Kaduna and Yaba, together with that planned for Benin City, one at Port Harcourt, and we hope one at Kano, will probably suffice if appropriately expanded.
>
> As the technicians' courses should preferably be taken concurrently with industrial training by students already in employment, they should,

> wherever possible, be conducted either on the sandwich or the part-time day-release basis. They should lead mainly to Certificate of the City and Guilds Institute. We propose that the technical institutes, in cooperation with employers, should provide short courses for potential supervisors and foremen.
>
> Associated with each technical institute there should be an advisory committee composed of representatives of leading employers. We recommend also the establishment by the Federal Government of a standing conference of Technical Education to facilitate cooperation between the technical institutes, to advise the Government on their needs, and to enlist the interest of employers.
>
> The technical institutes should provide full-time post-secondary, general commercial courses of a similar kind, and others designed to meet more specific needs of employers.
>
> The Commission drew attention to the very great difficulty with which the Federal Government was recruiting and retaining adequately qualified staff for the technical institutes, and emphasized that Nigeria would continue to recruit staff from abroad on attractive conditions of contract and on better salaries than, were paid at the time. (pp. 122-125)

In a White Paper issued in 1961, the Federal Government accepted the Harbison's Commission reports in principle as a standard for building education in Nigeria for the next decade.

Kilby (1969) wrote:

> It is important to note that the Commissions on Higher Education set in motion a chain of actions aimed at improving technical and vocational education. Not only did they lead to the College of Arts, Science, and Technology and the increased budget for technical training but also to a move for more trade centers and vocational centers that marked the beginning of a constructive

> policy. They accomplished this goal by stressing that "provision should be made for the systematic training of skilled labor at the lower levels" and by calling for a tripartite scheme of handicraft centers, trade centers, and technical institutes with the respective functions of pre-vocational training in the manual arts, the training of skilled craftsmen, and the training of technicians. One of the chief motives in launching the handicraft scheme was to help break down the colonial prejudice towards working with one's hands to instill in every boy as part of his general education a respect for manual skills and technical achievement. (p. 216)

UNESCO (1969) published that, from 1962, the curriculum was slightly modified and the craft schools became a sort of post-primary intermediate course from which pupils entering the trade centers were recruited. The trade centers became known as technical training schools. Under a new policy, all trade centers became technical schools and technical institutes were converted into technical colleges.

Policies and Administration of Vocational and Technical Education in Nigeria

The Ten-Year Educational Plan for Development and Welfare in 1946 gave a major place to technical education administration and the conscious planning of a system of education recommended by the report of the Commission on Higher Education in West Africa. "The formation of the Commission on Higher Education in West Africa in 1945 marked the beginning of constructive policy" (Report of the Commission on Higher Education in West Africa, 1945, p. 33).

This Commission recommended that the Higher College at Yaba be converted into a Technical Institute to produce the technicians that the country's economic development and eventual political independence would require. It further stressed the provision for the availability of systematic training of artisans of skilled labor at the lower levels. In 1946, some of the proposals were implemented as written in the Ten-Year Plan for Development and Welfare, wherein it called for a tripartite scheme of handicraft centers:

1. Trade centers and technical institutes with the respective functions of pre-vocational training in manual arts
2. The training of skilled craftsmen
3. The training of technicians.

A Colonial Development and Welfare grant was made available to pay for the first 5 years of the program.

Four main types of institutions were created: technical institutes, trade centers, handicraft, and domestic science centers. These were completely under government control.

Fafunwa (1974) wrote:

> The three regional governments started in earnest to implement the scheme, particularly in the North where fourteen craft schools were built between 1956 and 1960. The West built four, the East built nine, and two in Lagos. In spite of

> this initial enthusiasm on the part of the various regional governments, technical education remained the Cinderella of Nigerian education even in the 1970s. (p. 177)

All technical and vocational schools were under the control and administration of the government. By the late 1950s, some commercial and industrial firms had opened their own technical and trade schools to produce skilled manpower for their own needs on the job. These firms also sponsored students to study in the government institutions, and also made contributions for grants to aid the expansion of the government system rather than be directly in the administration of the educational activities.

Osuala (1976) found:

> In response to the Ashby Commission Report of 1961, a modest effort was made to establish liaison and to maintain close coordination between technical schools, business and industry. At the local level, technical institutes and trade centers were guided by their local authorities and voluntary agencies with the cooperation of the Ministries of Education. At the national level, the Federal Advisory Board on Technical Education and Industrial Training insured cooperation with the Ministry of Education, public corporations, industry and voluntary agencies in adjusting curriculum to the country's manpower needs. (p. 96)

All vocational and technical institutions were established by the government. The government, therefore, provided their immediate needs:

1. Building and equipment of educational facilities including classrooms, laboratories, and workshops.

2. Building and equipment of auxiliary facilities such as students' halls, teachers' quarters, and recreation and sports facilities.

In addition, the government provided the expatriate and the local staff, administrative expenses, students' maintenance allowances, and building maintenance.

The regionalization which started in Nigeria before the independence in 1960 gave each of the three regions the opportunity for independent program expansion in vocational and technical education.

The Report of the Commission on Higher Education in West Africa (1945) stated: "The technical institutes already described in Nigeria are for training crafts connected with 'European industries'" (p. 4). The technical training school prepares the artisan or craftsman in one or more skilled trades.

The course is a 3-year intensive instruction in classroom work and workshop practice leading to the City and Guilds of London Institute Certificate at the intermediate level, the Federal Craft Certificate, and the Ministry of Labor Trade Test Classes III and II as fitters, carpenters, motor-mechanics, sheet-metal workers, electricians, and bricklayers. The technical training schools also teach skills in commercial practice, printing, concrete practice, draughtsmanship, electrical installation, radio servicing, and refrigerator and air-conditioning servicing. Admission, previously

open to primary school-graduates, has been raised to post-craft school or secondary Class III or Secondary Modern III Certificate. Two years of industrial experience and 1 additional year of advanced courses will lead to the award of London City and Guilds Advanced Craft Certificate.

The Colleges of Art, Science and Technology, the Polytechnic, or the Technical Institute prepare technicians and businessmen at the intermediate level who supply the intermediate manpower needs of industry, business, and commerce. Admission is open to successful secondary-school graduates or candidates with equivalent qualification, and is by a competitive entrance examination organized by the institution. The courses are full-time and part-time, day and evening, and lead to the Ordinary National Diploma, the Higher National Diploma, or the Higher Certificate of the City and Guilds of London Institute. Currently, all the polytechnics and the colleges of technology in the country are authorized by the Federal Government, through the National Board for Technical Education to award Nigerian National Diploma.

The change from the Ordinary and Higher National Diploma to the Nigerian National Diploma has enabled the restructuring of the curriculum to properly reflect the technical manpower needs of Nigeria. Some of these

institutions award the Nigerian Certificate of Education (Technical).

The available courses are in accountancy, art, building and architecture, quantity surveying, telecommunications, business studies, civil engineering, commerce, electrical engineering, mechanical engineering, secretarial studies, training for laboratory technicians and technical assistants, the technician's diploma, the technician's certificate, town planning; sometimes ad hoc courses are offered in other areas of technology.

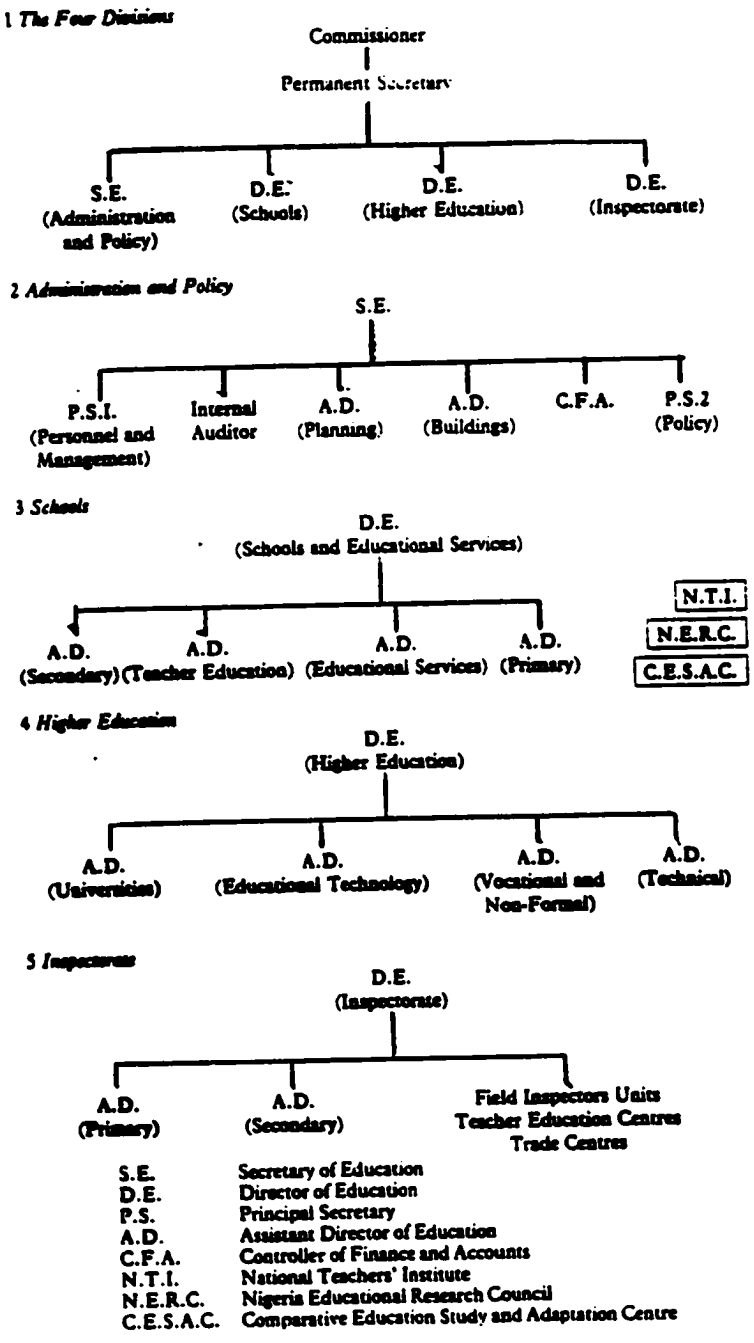
Students of Nigerian vocational and technical education programs sit for the London City and Guilds Examinations. The curriculum has been foreign-based, for foreign-based industry. European instructors, who may not be adequately equipped for the necessary skill areas needed in the country, were employed to train and develop Nigerian students for the unique manpower needs of Nigeria. A foreign curriculum and a foreign-based final examination do not augur well as the best way of developing the manpower needs of Nigeria.

Before establishing any technical and vocational program, a proper needs survey, community needs, industrial manpower needs, and student interest should be considered first. Foreign curricula and examinations, policies, and administration of vocational programs that are not related to the needs of the

community or the progress of the learners should be eliminated.

The administrative structures for education and for technical and vocational education do exist. (See Nigeria Federal Ministry of Education organizational chart in Figure 1.) To consider how this system works, it is important to bear in mind the issue of whether or not the organizational structure in fact constitutes the channels for implementing the policy objectives agreed upon by the communities.

In Nigeria, all educational systems come under the authority of the Federal Minister/Commissioner of education, who is the head in the Ministry of Education. The Permanent Secretary oversees the Secretary of Education (administration and policy), the Director of Education (schools), the Director of Education (higher education), and the Director of Education (inspectorate). The Director of Education (higher education) oversees the Assistant Directors of Education in the universities, educational technology, vocational and non-formal, and technical. Below the Director are the Assistant Director Technical and Assistant Director Vocational. The First National Rolling Plan 1990 (p. 212) published that, in pursuance of the task of making the curricula at all levels relevant to the needs of the society, the numerous agencies providing educational services under the Federal Ministry of Education were streamlined in 1987 for greater effectiveness into one



Source: Federal Ministry of Education, Science and Technology, Lagos.

Figure 1.

Divisions and sections in the Ministry of Education,

educational services council: the Nigerian Educational Research and Development Council (NERDC).

By its activities, the Council will help to update the educational system and give it the desired high quality. Figure 1 shows the Divisions and Sections of the Federal Ministry of Education.

Nwakobi and Lewin (1991), in their Educational Innovation in Developing Countries, observed that the organizational structure of the Federal Ministry of Education appeared to be a typical bureaucratic structure divided up into several vertical departments that seemed to function independently, bound only by their common allegiances to one chief executive at the top. Communication flowed along the vertical columns from the top downwards. There was no horizontal information flow and therefore no interdepartmental communication. There was a communication gap between the Inspectorate Division of the Federal Ministry of Education and the Division for Schools and Educational Services (p. 234).

The complexity of the system is such that the National Board for Technical Education (NBTE) that directly coordinates, administers, and advises the Federal Government on all aspects of technical and vocational education is under the Director of Education (higher education). This body was established under military decree No. 9 of January 11, 1977. The NBTE is the main advisory body for technical and vocational education. This board makes grants to

polytechnics and colleges of technology in accordance with quota formulas as laid down by the Federal Executive Council.

This body undertakes periodic reviews of the terms and conditions of service of personnel in polytechnics and colleges of technology. This board lays down standards of skills to be attained and continually reviews such standards as necessitated by technological and national needs. This body covers all areas of technical and vocational education and training, from policy-making to curriculum development and evaluation, from the planning and policy-making level to that of running individual institutions (Supplement to Official Gazette, 1977, p. A71).

UNESCO (1984) found that those in the top echelons of administration are for the most part academics with little or no practical experience outside teaching or educational administration.

> The administrative structures are for the most part in place. There is a problem of flow, the available structure tends to be static. Most administrators in technical and vocational education are drawn from the teaching profession, hence, top policy-making and executive levels are often not attuned to the realities of economic and employment. (UNESCO, 1984, p. 71)

Furthermore, UNESCO (1984), in deliberations of the International Experts Meeting on development and future trends, identified a number of problems common to administrators in many developing countries in the field of vocational and technical education programs. These are the

problems which must be overcome if development is to proceed at a rapid rate, and may be grouped under six general headings:

1. Social demands
2. Resource allocation and optimization
3. Relevance to development and manpower needs
4. Co-ordination with training agencies and "product" users
5. Techniques of plan and policy implementation (i.e., management)
6. Lack of administrative and financial managers.

Technological changes and labor market conditions must be reviewed and put into consideration when making policy regarding vocational education programs.

In addition, the technical and vocational education programs have been considered as the stepping stones to university education, and so the programs have become increasingly academic to the detriment of the practical side (p. 69). Quota systems of allocation and traditional values permeate the system from above and below. The internal dynamics are not geared to serving the purpose for which the system was designed.

It was reported in the National Rolling Plan that the vocational and technical education graduates and the industry coordination were lacking despite the creation of agencies to handle this.

> One of the causes of unemployment and financial waste in our educational system is lack of guidance and counseling of students on choice of subjects in their education and training programs. On completion of their education and training life, students discover that what they studied was not what the Labor Market required. (National Rolling Plan, 1992, p. 208)

The result was that only 30-40% of the young graduates from vocational and technical schools found employment in the field for which they were trained, whereas industry on the other hand lacked qualified skilled and middle-level manpower.

Nigerian education planners needed to determine manpower requirements and forecast the demand for skilled and educated manpower. The educators needed the assurance that the training capacity to produce the required manpower was available before embarking on any vocational program. Moreover, technical teachers who were technically and pedagogically competent should be adequately provided for in any programs offered.

Centralization of the National Board for Technical Education made effective directing, monitoring, supervision, coordinating, administration, and management of vocational and technical education programs a rigid and static effort for this autonomous Kaduna-based body, especially for a 30-state country like Nigeria. The authority and functions of this board were considerably large, and this could make it possible for slow execution of plans and ineffective administrative decision making.

UNESCO (1984), concerning administration and management of technical and vocational education in the developing countries, postulated that:

> Setting policy objectives and determining the areas of priority in a national plan are essentially political exercises. Whether or not these objectives are met is a question of management and administration. Though management and administration are inseparable, there is a very definite distinction to be made between the two: management is concerned with the output of the system, with its performance, with finding ways to meet the objectives set. Administration, on the other hand, is concerned with input, with directing, organizing and executing the routine operation that keeps the system running. Obviously there would be nothing for management to do if the administrative organization is non-existent, and conversely an organization operating without management may function but the question remains as to what end. (p. 65)

At the time of this research Nigeria was aware of the need to develop and improve its system of vocational and technical education so that it could contribute to the economic and social development. The problem was how this was to be achieved. Inadequate planning and management were at the heart of the problem. Without sound planning and good management, the stated policies, aims, and objectives of vocational and technical education in Nigeria would simply gather dust in the public archives.

Recommendations of the Comparative Technical Education Seminar Abroad, 1966

Adam Skapski led a commission appointed by the Federal Ministry of Education sponsored by the Ford Foundation under the auspices of United States Agency

for International Development to study foreign vocational and technical education programs in England, Holland, France, Sweden, and the United States of America. The 19-member commission was to identify some aspects of their technical education system worthy of adaptation into the Nigerian vocational and technical education programs.

Skapski (1966) wrote the following recommended objectives:

> 1. That a Comprehensive School system based on the United States and Swedish School systems should be introduced in Nigeria. The school curriculum should include 'Pre-vocational, Pre-technical and Pre-agricultural training; (including domestic science)
>
> 2. The Advanced Teacher Training Institutions should be established to provide training leading to the Nigerian Certificate of Education; (technical)
>
> 3. Teacher training facilities at the University of Nigeria, should be expanded; and,
>
> 4. Further training should be given to pre-vocational teachers with less academic or technical background to upgrade their technical and pedagogical skills. (p. 33)

Nwosu (1971) was thinking of this context when he pointed out:

> It is possible that the American Comprehensive school system, carefully revised to suit our needs and our present stage of development, might be more germane to our needs and aspirations than the British academically oriented system. (p. 122)

Federal and State ministries of education were considering corrective possibilities. New educational objectives were being considered.

Aims and Objectives of Vocational and Technical Education

Western-style education came to Nigeria with the missionaries in the mid-19th century. The first mission school was founded in 1843 by the Methodists. It was the Anglican Church Missionary Society that pushed forward in the early 1850s to fund a chain of missions and schools, followed quickly by the Roman Catholics.

> In 1887 in what is now southern Nigeria, an education department was founded that began setting curricula requirements and administering grants to the mission societies. By 1914, when the north and the south were amalgamated into one colony, there were fifty-nine government and ninety-one mission primary schools in the south; all eleven secondary schools, except King's College in Lagos, were run by the missions. (Metz, 1991, p. 49)

The educational system focused strongly on examinations. The school inspectorate, set up in 1920 to inspect discipline, buildings, and adequacy of teaching staff, gave the most points of performance to schools with high numbers and rankings of its examination results. This stress on examinations was still used in 1990 to judge educational results and to obtain qualifications for jobs in government and the private sector.

Metz (1991) reported that progress in education was slow but steady throughout the colonial era. By 1950 the country had developed a three-tiered system of primary, secondary, and higher education based on the British model of wide participation at the bottom, sorting into academic and vocational training at the secondary level, and higher

education for a small elite destined for leadership. On the eve of independence in the late 1950s, Nigeria had gone through a decade of exceptional educational growth leading to a movement for universal primary education in the Western Region. Secondary-level enrollment went from 10,000 for the country as a whole in 1947 to 36,000 in 1957; 90% of these, however, were in the south.

Universal primary education became official policy for the Federation in 1970s.

> Education in Nigeria is no more a private enterprise, but a huge Government venture that has witnessed a progressive evolution of Government's complete and dynamic intervention and active participation. The Federal Government of Nigeria has adopted education as an instrument par excellence for effecting national development. (National Policy on Education, 1981, p. 1)

It is only natural then that Government should clarify the philosophy and objectives that underlie its current massive investment in education and spell out in clear unequivocal terms the policies that guide Government's educational efforts.

In 1973, the Federal Government of Nigeria summoned a seminar under the chairmanship of Chief Simeon Adebo, a former Chairman of the National University Commission. These educational experts were to deliberate on all aspects of a National Policy on Education and to make some recommendations to the Federal Government. These experts were drawn from a wide range of interests which included representatives from the Islamic and the

Christian religious bodies, the universities, national universities' commission, external agencies, and ministries and organizations in private and public sectors.

This seminar was to deliberate on all aspects of a National Policy on Education. It was the Government's wish that any existing contradictions, ambiguities, and lack of uniformity in educational practices in the different parts of the Federation should be removed to ensure an even and orderly development of the country. Moreover, it was stated that for the benefit of all citizens, the country's educational goals, in terms of its relevance to the needs of the individual as well as in terms of the kind of society desired in relation to the environment and the realities of the modern world and rapid social changes, should be clearly set out. A large part of the revised National Policy on Education was based on the recommendations of the seminar. The aims and the objectives of vocational and technical education were clearly defined in the National Policy on Education and in the Fourth National Development Plan documents. The intended aims and objectives of vocational and technical education programs in Nigeria are found in the National Policy on Education (revised 1981) under Technical Education. The aims of technical education are:

1. to provide trained manpower in applied science, technology and commerce particularly at sub-professional grades

2. to provide the technical knowledge and vocational skills necessary for agricultural,

industrial, commercial and economic development

3. to provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man

4. to give an introduction to professional studies in engineering and other technologies

5. to give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant

6. to enable our young men and women to have an intelligent understanding of the increasing complexity of technology. (National Policy on Education, item 49, section 6; p. 28)

Since education is a dynamic instrument of change, this policy was constantly reviewed to ensure its adequacy and continued relevance to national needs and objectives, so specific objectives were set for technical education in the Fourth National Development Plan 1981-1985 as written in Chapter 3, item No. 2 on page 37 of Volume II edition of the Federal Republic of Nigeria Development Plan published by the National Planning Office in Lagos.

The overriding aim of the country's development efforts remains that of bringing about an improvement in the living conditions of the people. A number of specific objectives are, however, woven around this goal. The specific objectives set for the Fourth Plan period are as follows:

1. Increase in the real income of the average citizen;

2. More even distribution of income among individuals and socio-economic groups;

3. Reduction in the level of unemployment and under-employment;

4. Increase in the supply of skilled manpower;

5. Reduction of the dependence of the economy on a narrow range of activities;

6. Balanced development--that is, the achievement of a balance in the development of the different sectors of the economy and various geographical areas of the country;

7. Increased participation by citizens in the ownership and management of productive enterprises;

8. Greater self-reliance--that is, increased dependence on our own resources in seeking to achieve the various objectives of society. This also implies increased efforts to achieve optimum utilization of our human and material resource;

9. Development of technology;

10. Increased productivity; and

11. The promotion of a new national orientation conducive to greater discipline, better attitude to work and cleaner environment. (p. 37)

In the 1990-1993 National Rolling Plan, new priority areas of realizing the set goals and objectives of this development plan are centered on agricultural production and processing, which is necessary if the country is to be able to feed her large and rapidly growing population.

The aims and specific objectives are changing according to the national needs and the industrial demands which also affect the development of the curricula for training in the vocational and technical

institutions. The few changes that have so far taken place from one plan period to another have been largely the result of experience gained in the implementation of the successive plans.

Nigerian's philosophy of education, therefore, is based on the integration of the individual into a sound and effective citizen and equal educational opportunities for all citizens at the primary, secondary, and tertiary levels, both inside and outside the formal school system.

Under Section 11, entitled Administration and Planning of Education, item No. 85 stated: The success of any system of education is hinged on proper planning, efficient administration and adequate financing. Administration includes organization and structure, proprietorship and control, inspection and supervision.

Item No. 86 iii: (a) the management of schools is placed in the hands of district school boards of management; (b) the coordination, planning, financing, and direction of the total educational effort within the State is placed in the hands of the State Ministry, Department or Directorate for Education.

Item No. 89: The objectives of the planning, administrative, inspectorate, supervisory and financial services in education are:

1. To ensure adequate and effective planning for all educational services;

2. To provide efficient administrative and management control for the maintenance and movement of the system;

3. To ensure quality control through regular inspection and continuous supervision of instructional and other educational services;

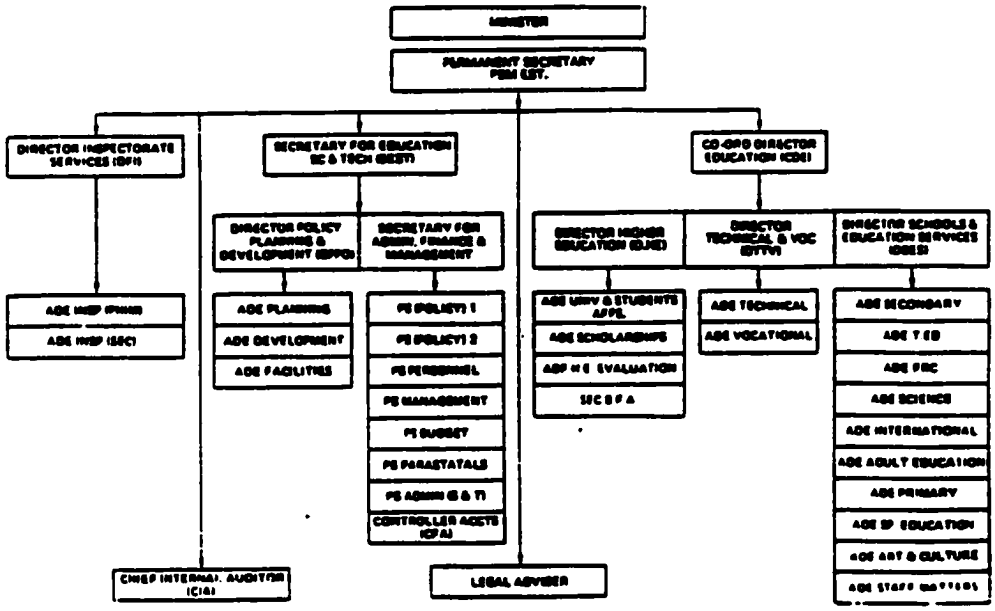
4. To provide adequate and balanced financial support for all educational services.

To accomplish these objectives, Government has already established a Federal Inspectorate Service and an Education Planning Section in the Federal Ministry of Education. Figure 2 shows the organizational chart of the Nigerian Federal Ministry of Education.

Technical and Vocational Teachers Education

The issue of excellence in vocational teaching has been very important to the profession since its beginning, but it is more significant now than ever in Nigeria's quest for modern technology as well as the acquisition of practical and applied skills necessary for agricultural, industrial, and economic development.

The Fourth National Development Plan 1981-1985 and the current National Rolling Plans 1990-1994 in existence placed national priority on science and



Nigerian Federal Ministry of Education: organisational chart

Source: **Federal Ministry of Education**

Figure 2.

Nigerian Federal Ministry of Education organizational chart.

technology development. The Federal Republic of Nigeria National Policy on Education (1981) section 6 on Technical Education showed that the administration was aware of the shortage of trained indigenous personnel and that only limited facilities existed for technical teacher education.

The Fourth National Development Plan 1981-1985 on Technical Education stated:

> Technical education will continue, as in the preceding period to command the priority attention of the government. More technical colleges and vocational training schools will be built in order to increase training facilities for craftsmen, artisans and technicians. The existing polytechnics and colleges of technology will be strengthened and new ones built. In this regard it is the policy of the Federal Government to ultimately provide one technical college and one polytechnic in each state of the federation. (p. 257)

Nigeria needs excellent vocational and technical teachers not only to produce the kinds of workers business and industry want and need, but to keep vocational and technical education as a viable component of education in Nigeria. Only by achieving high-quality programs can the state, local, and national policy makers be convinced that vocational and technical education is a necessary tool for the advancement and development of the country and the citizens.

Okoro (1979) in his study on the Evaluation Model for Vocational Teachers found:

> The origin of vocational teacher education programs in Nigeria is in several respects similar to the origin of secondary education in Nigeria. Vocational teacher education programs were introduced into Nigeria by American educators who established essentially the same kind of programs that existed in their colleges. (p. 7)

Okoro (1979) also found:

> Vocational teacher education programs are of recent development in Nigeria. It was previously assumed that no special program for the training of vocational teachers was necessary, that all a vocational teacher needed was skill in his trade. The first program for the training of vocational education teachers was established at the University of Nigeria in 1965 with a grant from Ford Foundation. The Ford Foundation provided funds for personnel development and equipment and awarded scholarships to students in vocational teacher education in order to stimulate interest in the program. (p. 133)

Taiwo (1981) also wrote:

> The National Technical Teachers' College, Yaba, Lagos, was established in 1968 to prepare well qualified non-graduate teachers of technical and commercial subjects. The program was reported to be parallel to an advanced teachers' college and its extra curricular and corporate life were much the same. The output of the college was inadequate to meet the demands of the existing technical training schools and technical institutes. . . . The lack of qualified teachers of technical subjects had been one of the disadvantages of technical education in the country. (p. 147)

The government is aware that only limited facilities exist for technical teacher education. A conscious effort has been made to expand the facilities for the training of technical teachers. With the advent of SAP, the need to produce technical teachers locally became compelling. Therefore in addition to the two existing Federal Colleges of Education (Technical)

at Akoka, Lagos, and Gombe, where NCE (Technical) are at present trained locally, six more colleges are being established at Asaba, Bichi, Omoku, Umunze, and Gusau. There are other National Technical Colleges at Calabar, Enugu, and Kaduna offering sub-degree technical education programs for the Technical Teachers Certificate and the National Certificate of Education (Technical). As of May 1990, at the meeting of the Provosts and Heads of all NCE awarding institutions, 46 out of the 53 Colleges of Education were represented.

In recent years, Federal and State governments have encouraged the training of technical and business teachers at all levels of education through vocational training centers, technical colleges, Polytechnics and Colleges of Technology.

In addition to these, some Nigerian universities offer degree courses in Industrial Education, Industrial Art, and Technical and Vocational Education: University of Nigeria, Nsukka, in Anambra State; and Ahmadu Bello University at Zaria in Kaduna State.

The National Commission for Colleges of Education, Minimum Standards for NCE Teachers in Vocational and Technical Education, was established and approved on the 27th of November, 1990, under a ministerial letter.

The format for inspection reports on the quality of primary and secondary education has been standardized

by the National Council on Education. The Federal Inspectorate of Education which has been decentralized for effective coverage of schools in all the 589 local government areas said in a statement:

> When one considers the total annual investment in education which runs into billions of naira, it becomes inevitable that the Inspectorate services should be strengthened to carry out the enormous responsibility of maintaining minimum standards. (West Africa, June 1-7 1992, p. 127)

The Nigerian Vice President, Alex Ekueme, and the Vice President of the United States of America, George Bush, signed an agreement in September 1981 that the United States of America embarked on a cooperative program through which Nigerian technical teachers and prospective teachers will receive training in American universities leading to degrees in vocational, industrial, technical, agricultural, and business education. This program, Nigerian Technical Teacher Training Program, is fully funded by the Federal Government of Nigeria under the auspices of the American International Development Reimbursable Training Program. This program is a result of an initiative on the part of the Nigerian government to emphasize professional, technical, and pedagogical development of vocational teachers. It is a small program when viewed in the context of the substantial and growing shortage of well-qualified vocational and technical educators. As of the end of 1986, about 1,334 students had been trained under the program.

Damanchi (1973) had earlier said:

> Staffing the existing institutions and those planned for future, it is an important step to address the serious impediment to Nigeria's sustained industrial and technological development posed by the inability of its institutions to keep pace with demands for well trained middle level technical manpower and the vocational teachers. (p. 86)

Speaking on the instability of the educational system in Nigeria, the Registrar, Joint Admission and Matriculation Board, Alhadji Abdulrahman said:

> Many factors are responsible for this. The situation where the teachers are hardly there to provide teaching, situations where the teaching facilities are not there; situation where the pressure on educational resources is so much. The problem of the instability of the educational system is such that we change the school year from one system to another as it happened between 1986 and now. (Newswatch, 1992, p. 47)

Resources

An immediate goal for the Nigerian vocational education and training system is better utilization of existing resources, but the ultimate goal goes beyond this to equitable provision of effective and economic education and training to all Nigerians. Both goals require improved planning and coordination between vocational educators and governmental units to the degree politically possible.

Omotosho (1985) said:

> The most obvious crisis in education today in Nigeria is financial. But there are far more fundamental crises in education in Nigeria: managing education, employing education, equipping education, organizing education and believing in education. During the Shagari presidential era it was commonplace for a

> teacher not to have been paid for a period of six to eighteen months. (p. 212)

Brod and Wiedmer (1986) said that to retain and attract outstanding vocational teachers, increased attention and resolution must be brought to the long-standing basic issues of teacher compensation, morale, prestige, and job satisfaction. UNESCO (1984) in a comparative study of policy, planning, and management in technical and vocational education mentioned the importance of the structure of government as a determinant of the extent to which technical and vocational education policy objectives are set and implemented by a national government.

UNESCO (1984) stated:

> Attitude and values with regard to education head the list of the most frequent barriers: scientific and literary education and the occupations and professions to which these lead enjoy the greatest prestige and come first in the scale of ambitions of young people and their families. Finding ways of enhancing the value placed on technical and vocational education by individuals and society is therefore one of the greatest challenges facing countries attempting to implement the broad objectives of vocational education. In terms of material barriers, the problem for developing countries is sheer lack of financial resources to build, maintain and operate the facilities, and to train and pay qualified staff. (p. 48)

On his first 100 days in office, General Buhari, the Military Head of State, announced that

> on education, the government should not be expected to provide free education under the prevailing economic situation. He said that education should be the responsibility of the Federal, State and Local Governments, as well as parents. The administration was carrying out an immediate review of the national policy on education. (West Africa, 1984, p. 816).

Thus, the ultimate objective of the Government to make education free at all levels has been defeated for lack of objective planning and vision.

Financing of Technical Education

Nigeria's economic rise in the 1970s among oil-exporting countries encouraged flamboyant educational objectives and policies especially for vocational and technical programs, but its subsequent collapse in the 1980s has greatly affected the implementation of the plans for development. As the nation's economic resources dwindled, it became increasingly difficult for the government alone to meet adequately the financial needs of all sectors of the economy. Not the least affected was the education sector which had witnessed massive expansion in terms of student population and infrastructural facilities during the oil-boom period. Consequently, standards fell as available resources were no longer sufficient to maintain these facilities.

The Federal Republic of Nigeria National Policy on Education (1981), Section 12, items 105-107, explained that:

> (105.) Education is an expensive social service and requires adequate financial provision from all tiers of Government for a successful implementation of the educational programs.
>
> (106.) Government's ultimate objective is to make education free at all levels. The financing of education is a joint responsibility of the Federal, State and Local Governments. In this connection, Government welcomes and encourages the participation

> of local communities, individuals and other organizations.
>
> (107.) Government recognizes the importance of technical and commercial education and the need to relate its programs to the requirements of commerce and industry. Formulae for collaboration and joint responsibility, such as is already being carried out in schemes like the Industrial Training Fund (ITF) will be designed for sharing cost burden between the public and private sector. (p. 49)

The Federal Government of Nigeria attaches much importance to education. The extent of this importance is demonstrated in the large increase in funds allocated to education from year to year.

> During the Third National Development Plan period, the education sector accounted for about N3.2 billion (1.28 billion United States dollars) or 12 per cent of a total public sector effective program of N26 billion (10.4 billion United States dollars). In absolute terms the amount allocated to education was more than the estimated total public sector program during the preceding plan period. The most notable feature of developments in the system during this period was the phenomenal rise in enrollment at all levels of the educational system. The number of primary schools rose from 21,223 in 1975-76 to 37,469 in 1979-80; showing a total of 16,246 schools injected into the system within a period of five years. Enrollment in technical, polytechnics and colleges of technology rose from 11,993 in 1975-76 to 35,777 in 1979-80 representing an average annual increase of about 40 per cent. (Fourth National Development Plan 1981-85; p. 255)

The increase in enrollment at all levels of the educational system affected the increase of the output of the Nigerian educational system and its contribution to the labor force in the primary, secondary and the tertiary level. The rapid growth of the educational system has tended to worsen the problem arising a from shortage of

qualified teachers, especially at the vocational and technical institutions.

Professor Jibril Aminu, Federal Minister of Education, stated in West Africa (November, 1987):

> The educational system was not short of funds, the problem, was financial imprudence, inefficiency, neglect and gross lack of care of equipment. The Federal Government of Nigeria in its effort to perfect the new system of education voted N94 million Nigeria Naira money for a five-year program for the mass production of technical teachers in the country. Thirteen higher institutions are handling the scheme which will increase the number of teachers from 5,593 to 102,083. (p. 2343)

The Fourth National Development Plan 1981-85, Vol. 2, is still in use in conjuction with the National Rolling Plan printed by the Federal Ministry of Budget and Planning. The Minister of National Planning said:

> Nigeria's Federal Military Government will not introduce any new development plan, but will review the current one and decide which projects to execute, and that drawing up a fresh plan would be wasteful, as "a leaf could be borrowed from the present one." (West Africa, 1984, p. 341)

Item No. 20, Programs and Projects, stated:

> The programs and projects planned for the education sector embody to a large extent, though with varying degree of emphasis among governments, the guiding principles and objectives set out in the National Policy on Education. As stated earlier the central theme of the Policy is that education should serve the goal of social transformation and the development of people. The strategy to achieve this aim would seek to consolidate the quantitative gains made during the preceding plan periods through measures to improve the quality of education at all levels while

maintaining a steady rate of increase in enrollment and classroom space.

> The total capital investment by the Federal, State and Local Governments is N7,703.079 million. This represents approximately 9.3 per cent of the planned public expenditure program of N82 billion or 10.6 per cent of the public sector program. This must be one of the largest allocations ever made to education in the development plan of any developing country and attests to the very high priority placed by all governments in the Federation on education as an important engine of development. (p. 259)

The total allocation for education under the Federal program is N2.45 billion ($0.98 billion U. S.). The total allocation for secondary education is N202.680 million ($81.07 million U. S.). The program involves mainly the consolidation and expansion of the 39 Federal Government boys' and girls' colleges located in every state in the country. A total of N28.5 million ($11.4 million U. S.) is being spent on expanding the seven Federal Schools of Arts and Sciences.

Nelson (1982) in his research studies on Nigerian education wrote:

> Oil revenues notwithstanding, the costs of construction and training proved to be enormous; general inflation and the inadequacies of some of the construction (owing in part to bad planning, in part to the corruption of some contractors) have raised costs considerably, a problem compounded by the decline of oil revenues in some years. Thousands of classrooms have been built, but the training of teachers takes time. Despite the proliferation of teacher training colleges and universities, the trained teachers--at all levels--envisioned by policy makers were still not available in 1981. The institution of Universal Primary Education (UPE) a six-year program has led to the near quadrupling of primary school pupils--from 4.4 million in 1974 to more than 15 million in 1980. Their teachers,

> however, range from the well-trained to the barely trained. The much smaller secondary school system has also quadrupled--from a little more than 500,000 in 1974 to roughly 2 million in 1980. Included are grammar (academic) schools, comprehensive schools (not intended for prospective university students), vocational and technical training, and teacher training for primary school employment. Given the range of subjects and the level at which they are supposed to be taught, fully trained staff are in even shorter supply. Some posts were still filled by non-Nigerians. Comprehensive and vocational schools have come to be considered inadequate, and it is intended that more skills should be better taught in the future. (p. 130)

The following tables are the latest concise published data by the Federal Ministry of Budget and Planning, Lagos, for the Republic of Nigeria National Rolling Plan 1992-1994. Table 1 shows the number of enrollments in post-primary institutions by state and sex. Total enrollment in Nigeria's post-primary institutions stood at 2,988,174 in the 1984-85 academic year and it was stable at 2,901,993 five years later. Some individual states show tremendous increases and some show drastic drops in the male and female enrollments. Bendel State had an enrollment trend of 310,929 in the 1984/85 school year, but dropped to 273,958, with the female enrollment dropping from 144,705 in 1984/85 to 104,277 in 1990. Cross River State had a 151,825 student enrollment in 1984/85 and dropped to

TABLE 1

STATISTICS OF POST-PRIMARY EDUCATION IN NIGERIA TOTAL ENROLLMENTS IN POST PRIMARY INSTITUTIONS BY STATE AND SEX 1984/85-1990

State	1984-85		1985-86		1987		1988		1989		1990	
	M/F	F	M/F	F	M/F	F	M/F	F	M/F	F	M/F	F
1. Akwa Ibom	•	•	•	•	95,385	19,444	71,091	34,925	69,533	34,905	82,913	45,400
2. Anambra	206,341	127,295	281,836	126,282	170,677	101,829	171,474	103,614	181,336	104,347	178,574	106,802
3. Bauchi	64,429	28,993	49,781	13,577	64,985	16,980	83,873	18,445	27,144	18,125	56,251	19,379
4. Bendel	310,929	144,705	297,325	133,892	253,828	111,833	249,369	110,332	198,618	82,749	273,958	104,277
5. Benue	115,949	36,818	106,566	34,842	126,291	39,088	112,838	36,701	111,574	37,104	17,491	35,577
6. Borno	89,456	....	78,948	22,891	72,912	25,193	81,398	28,395	77,883	37,101	77,421	28,494
7. Cross River	151,825	74,226	123,548	68,119	48,577	23,888	45,274	28,849	38,448	21,643	58,996	24,972
8. Gongola	81,787	21,834	88,367	23,081	83,570	34,089	86,674	25,468	61,222	16,406	75,998	22,284
9. Imo	243,988	135,791	215,458	117,489	298,941	131,291	232,616	123,848	251,249	139,124	245,834	131,829
10. Kaduna	205,576	58,913	201,438	61,435	145,252	34,927	148,133	53,892	151,589	52,583	136,456	35,120
11. Kano	185,431	12,045	181,931	13,649	187,483	16,563	118,496	21,218	188,457	21,225	188,488	25,637
12. Katsina	•	•	•	•	74,119	14,730	69,185	12,964	39,572	5,576	64,771	9,192
13. Kwara	150,181	64,420	144,218	64,217	127,467	57,835	131,983	59,727	167,214	61,658	128,442	57,771
14. Lagos	269,233	138,917	290,716	148,925	322,107	158,224	338,476	168,739	351,670	168,207	344,835	163,454
15. Niger	83,542	....	74,481	19,613	83,251	21,985	99,769	24,519	94,539	27,508	79,863	26,730
16. Ogun	172,657	88,346	141,701	65,836	132,935	61,186	134,997	57,225	112,241	51,234	122,004	59,442
17. Ondo	186,934	90,436	299,629	145,877	182,911	85,460	189,826	88,861	140,930	69,383	178,988	82,364
18. Oyo	428,642	281,898	449,814	213,474	333,894	155,921	334,623	149,495	313,898	144,822	293,744	137,570
19. Plateau	108,112	33,928	88,835	26,951	92,071	32,548	89,899	31,832	81,237	29,827	97,455	36,082
20. Rivers	89,049	36,572	79,288	32,883	74,936	30,843	92,186	39,625	88,685	34,321	108,872	44,102
21. Sokoto	62,827	11,774	68,399	13,187	73,977	12,363	78,377	13,879	66,121	11,134	68,181	13,741
22. FCT	11,112	3,329	11,228	3,476	15,462	4,886	14,374	5,256	26,188	8,899	31,259	12,206
Nigeria	2,988,174	1,348,752	3,088,711	1,333,718	2,934,349	1,234,127	2,941,781	1,212,344	2,723,791	1,142,143	2,901,993	1,240,525

Note: Figures for Akwa Ibom and Katsina States were included among those of Cross Rivers and Kaduna States respectively. M/F=Both sexes; F=Females only.
Source: Statistics Branch, Federal Ministry of Education, Lagos, April 1991. Reprinted by permission FROST from National Rolling Plan 1992-1994, p. 188.

58,996 in 1990. Oyo State had 428,442 students in the 1984/85 school year and dropped to 293,744 in 1990. Rivers State increased from 89,049 students in the 1984/85 school year to 100,872 in 1990. Federal Capital Territory with a total enrollment of 11,112 in 1984/85, increased to a total enrollment of 51,259 in 1990.

Table 2 shows the number of technical and vocational schools by state. Despite the fact that the total number of technical and vocational schools in the states are incomplete in 1986, there still was an increase of 65 schools. The number of technical and vocational schools rose from 235 in 1982 to 300 in 1986. Anambra State had 27 technical and vocational schools in 1982 but the number dropped to 21 in 1986. Bendel State. which had only 13 technical and vocational schools in 1982, had 86 in 1986. Lagos State had only 1 technical and vocational school in 1982 but the number rose to 28 in 1986. Oyo State, which had 36 technical and vocational schools in 1982, had only 6 in 1986. Rivers State had a stable number of 5 technical and vocational schools from 1982 to 1986. The number of technical and vocational schools in Sokoto State decreased from 18 in 1982 to 6 in 1986. Federal Capital Territory, Abuja, had no figures available from 1982 to 1986.

TABLE 2

NUMBER OF TECHNICAL AND VOCATIONAL SCHOOLS BY STATE 1982-1986

STATE	1982	1983	1984	1985	1986
Anambra	27	21	5	5	21
Bauchi	10	9	10	10	11
Bendel	13	13	13*	21	86
Benue	n.a	n.a	12	12	10
Borno	n.a	n.a	n.a	n.a	12
Cross River	23	23	23*	22	8
Gongola	19	17	18	17	20
Imo	14	14	14	14	10
Kaduna	5	5	5*	n.a	1
Kano	21	22	13	13	13
Kwara	9	9	9*	10	9
Lagos	1	n.a	n.a	20	28
Niger	12	12	12*	8	14
Ogun	8	8	8	8	8
Ondo	11	11	11	11	31
Oyo	36	36	36*	6	0
Plateau	3	3	4	4	1
Rivers	5	5	5	5	5
Sokoto	18	n.a	4	4	6
F. C. T. (Abuja)	n.a	n.a	n.a	–	–
Total	235	208	202	(190)	(300)

Note: n.a.=Not available. *Provisional figure. ( )=Incomplete total.
Source: Federal Ministry of Education, Science and Technology. Reprinted by permission FMEST from National Rolling Plan 1992-1994 p.192.

Table 3 shows the number of students in technical and vocational schools by state from 1981/82-1985/86. Most of the states showed a tremendous decrease in the number of students in technical and vocational schools. The number of students in technical and vocational schools in Anambra State increased from 5,852 in 1981/82 to 6,260 in 1985/86. The number of students in technical and vocational schools in Bauchi State increased from 990 in 1981/82 to 1,303 in 1985/86. However, the number of students in technical and vocational schools in Borno State dropped from 8,070 in 1981/82 to 2,607 in the 1985/86 school year. Cross River State dropped from 10,609 in 1981/82 to 3,900 in 1985/86. Kaduna State dropped from 3,852 in 1981/82 to 399 in the 1985/86 school year. Sokoto State with 5,981 students in her technical and vocational schools in 1981/82 dropped to 2,847 in the 1985/86 school year. "The decrease in the number of students in technical and vocational schools in some of the states was due largely to the establishment of new universities by state governments" (First National Rolling Plan 1990-1992, p. 221).

Technical Education

The investment in technical education estimated at N400.20 million ($160.08 million U. S.) takes the second largest share of the total financial allocation to the sector after higher education. This is a reflection of the very high priority attached to training of technical

TABLE 3

NUMBER OF STUDENTS IN TECHNICAL AND VOCATIONAL SCHOOLS BY STATE 1981/82-1985/86

State	1981/82	1982/83	1983/84	1984/85	1985/86
Anambra	5,852	5,490	7,274	2,462	6,260
Bauchi	990	1,186	1,626	1,433	1,303
Bendel	8,698	7,675	7,793	6,498	8,506
Benue	3,534	n.a	n.a	4,432	3,334
Borno	8,070	n.a	n.a	n.a	2,607
Cross River	10,609	12,321	10,810	10,112	3,900
Gongola	2,907	2,986	4,575	3,981	6,845
Imo	5,625	5,477	5,579	5,086	5,803
Kaduna	3,852	4,542	5,291	5,291	399
Kano	4,298	5,607	4,536	2,926	4,248
Kwara	6,130	6,135	n.a	5,709	5,065
Lagos	n.a	n.a	n.a	3,171	5,348
Niger	4,177	4,655	4,978	2,890	6,280
Ogun	2,741	2,960	2,904	2,574	2,663
Ondo	2,940	3,560	3,798	5,130	4,092
Oyo	3,018	4,000	4,071	4,450	4,672
Plateau	1,075	1,036	2,921	1,401	586
Rivers	3,402	n.a	2,921	1,714	1,676
Sokoto	5,981	7,743	7,165	2,876	2,847
F. C. T. (Abuja)	n.a	n.a	n.a	–	–
Total	(83,899)	(75,392)	(76,242)	72,136	76,434

Note: n.a.=Not available; Source: Federal Ministry of Education, Science and Technology. Reprinted by permission FMEST from National Rolling Plan 1992-1994 p.198.

manpower at all levels during the Plan period.

In doing so, Government realizes the need to plan boldly to meet in the shortest time possible the technical and technological manpower needs of the country. National Rolling Plan 1992, published by the Federal Ministry of Budget and Planning, stated:

> In 1987 a special grant was made available for the rehabilitation programs especially to meet the accreditation requirements of the N.B.T.E. In this regard efforts are being made also to restructure the curricula away from management towards technological courses in order to attain the 70:30 science to arts ratio in enrollment prescribed for these institutions. The shortage of technological teachers to meet the 6-3-3-4 system is one of the challenges being met under the Structural Adjustment Plan period. A study conducted by the Federal Ministry of Education in 1986 revealed a shortfall of 94.5% of technological teachers nation wide. (p. 211)

A sum of N10 million ($4 million U. S.) is to be spent on the replacement of worn-out buildings and equipment at the Federal Technical College, Yaba. Seven new Federal Technical Colleges will be built at a cost of N79 million ($31.6 million U. S.).

These colleges will offer advanced craft courses so as to provide high-level training for craftsmen and graduates occupying supervisory positions in industry. The colleges will also provide the basis for the training of teachers for technical schools.

The Federal Polytechnic at Yaba has been expanded at a cost of N15 million ($6 million U. S.) and its student capacity has increased to 8,000. Construction work on the

six polytechnics at Akure, Bida, Bauchi, Idah, Ilaro, and Yola have been completed on their permanent sites during the period at a total of N191 million ($76.6 million U. S.)

Three new polytechnics were established at Unwana, Afikpo, and Ado-Ekiti at a cost of N80 million. The National Board for Technical Education has built two centers of work experience (SIWES) where graduates from technical colleges and polytechnics are undergoing industrial experience by training on the job.

Teacher Education

A total sum of N189 million ($75.6 million U. S.) was earmarked for teacher education. In line with the Plan objectives, the program emphasizes the expansion of existing facilities and the enhancement of the quality of trained teachers through the provision of adequate equipment and material.

The two Technical Teachers Colleges in Akoka, Lagos, and Gombe have been developed at a cost of N4 million ($1.6 million U. S.) to take in 1,500 students each since 1985. The production of qualified teachers at all levels of the educational system is emphasized in the context of the new National Policy on Education that the National Commission for Colleges of Education was established in 1989. Six new Federal Colleges of Education (Technical) at Asaba, Bichi, Omoku, Umunze, Potiskum, and Gusau altogether have N13 million ($5.2 million U. S.) for

completion of academic buildings, laboratory equipment, and hostels.

Student Financing

A total sum of N273 million ($109.2 million U. S.) has been earmarked for the student financing needs of the Federal Government. During this period undergraduate and postgraduate scholarship awards were made and a sum of N10 million ($4 million U. S.) was disbursed as loans under the Nigerian Students Loans Scheme. A sum of N120 million ($48 million U. S.) was spent on servicing existing bursary awards and granting new ones for student teachers admitted to Federal Advanced Teachers' Colleges and Universities. Efforts are now being made by the various levels of government to tackle the problem of student financing during this (SAP) period. At the federal level, the Students Loan Board and the Federal Scholarship Board were re-organized in order to provide better services to deserving students.

Mosley (1992), in Policy Making Without Facts, stated:

> A note on the assessment of structural adjustment policies in Nigeria 1985-1990 said that the major strategy for economic transformation in Nigeria has changed from comprehensive economic planning to a structural adjustment program. It remains the case that the policy makers face uncertainty concerning the economy's current position and its response to past policies. The nature of the economy's response remains shadowed by discrepancies between the available data sets. The challenge facing the Nigerian authorities in this situation is therefore

> not to pursue their objectives in face of known constraints, but rather to evolve strategy which will be workable in an environment where the stance of government policy did not change and adjustment was effected through gradual depletion in Nigeria's foreign exchange reserves. (p. 227)

The Federal Republic of Nigeria National Policy on Education (1981), Section 6, on Technical Education item 46, said:

> Government is aware that the role of industry in providing technical training outside their own programs, is negligible. Their programs are aimed mainly at the training of the products of our institutions whom they generally consider unusable without such further training, owing to lack of practical experience.

Also in item 47 of Section 6, the Government deplores the general public's attitude which regards technical education as somewhat inferior to other types of education. In item 50 (i), the government is aware that only limited facilities exist for technical teacher education. In recruiting teachers (ii) for the technical education institutions, the industrial experience of candidates will be given the highest premium.

In Section 4, item 24, "Crash or emergency programs will be mounted to produce a large number of science, commercial, technical and craft teachers." In Section 9, teacher education, item 81, the government will introduce measures to enable teachers to participate more in the production and assessment of educational materials and teaching aids, the planning and development of curriculum,

school buildings and furniture, and evaluation of technical innovation and new techniques.

International Assistance

International assistance from foreign agencies helped a lot in the early development of vocational and technical education in Nigeria. The United Kingdom was the main source of financial assistance to Nigeria's development projects before independence. After independence, foreign agencies acted autonomously on the basis of agreements which were entered into with the Nigerian government to provide funds for educational training, expansion, and operations.

Some of the agencies whose financial activities have assisted Nigeria's educational development were the United Nations Educational and Scientific Cultural Organization, the United States Agency for International Development, the Ford Foundation, Carnegie Corporation, Rockefeller Foundation, World Bank, UNICEF, and the International Labor Organization. These organizations sponsored training programs in agricultural education, business education, home economics, and other vocational areas of need in Nigeria.

The governments of the old Soviet Republic, Canada, Federal Republic of Germany, Netherlands, and the United States were among the various countries whose aid was used as follows: (1) the supply of teaching and administrative staffs; (2) organization of training courses for vocational teachers, school administrators, and supervisors; (3)

capital grants for building and equipment of educational establishments; and (4) the supply of school equipment, award of scholarships, fellowships, bursaries, and exchange programs for studies abroad. The equipment for the Junior Secondary Schools' (JSS) workshop was provided in all the states under the technical assistance agreements with the governments of Bulgaria, Czechoslovakia, and Hungary. A similar agreement was entered into with the government of East Germany for the Senior Secondary Schools (SSS) throughout the federation.

It can be seen from the analysis of the reviewed literature on historical, social, administrative, and cultural context the implications forming the relationships affecting education policy, the adequacy of vocational and technical programs, and in particular the administrative problems of staffing vocational programs. Social demands, development objectives, economic context, and resources available must, therefore, be part of the needs survey that the administrators have to consider and then use these factors in determining technical and vocational education policy objectives. The process is dynamic and interactive. Policy adopted and implemented for technical and vocational education ought to consider teacher input so that it can and should influence change in the other factors where change is called for, especially for the graduates of Nigerian technical and vocational institutions.

UNESCO (1984), writing within the context of Policy, Planning and Management of vocational and technical education, stated:

> Indeed sound technical and vocational education policy should be directed precisely to changing social values and teacher need for the programs when these militate against democracy, to improving the economic context by rendering the country more productive and the standard of living of individuals and families higher; that is to achieving development objectives. In the process, more resources, human and material, will be created to devote to this effort, and a greater portion of available resources will be allocated to it. (p. 52)

Parrish (1985) also wrote:

> Vocational and technical educators are perhaps the most knowledgeable group of professionals that can and should influence the identification and resolution of the current issues in vocational and technical education. (p. 44)

This study, therefore, sought to address the aspect of the issues for the country's vocational and technical teacher need and the perceived adequacy of the vocational and technical education programs. Is there a scarcity of competent vocational and technical teachers in Nigeria? Are the curricula content of vocational and technical education programs meeting the objectives of the development plans and the needs of the job market? What are the issues in vocational and technical education policy and decision making that are affecting the programs?

Types of Vocational and Technical Education in Nigeria

There are currently three types of vocational and technical education institutions outside the universities. The non-university technical education institutions in Nigeria consist of:

1. Post-primary Level
    a. Pre-vocational
    b. Vocational Centers
2. Secondary Level
    a. Commercial Secondary Schools
    b. Comprehensive Secondary Schools
    c. Technical Secondary Schools
3. Post-secondary Level
    a. Technical Colleges
    b. Trade Center/Trade School
    c. The Polytechnics/Colleges of Technology
    d. National Technical Teacher College
    e. Vocational Teacher Education.

The duration of training varies and the programs are designed specifically to meet the manpower needs of the particular industry which these institutions service (A Review of the Format and Structure of Technical Education in Nigeria. N.B.T.E. Kaduna, 1981, p. 14).

The range of courses or programs in Nigeria's technical schools and trade centers are: agriculture, block-

laying, brick-making and concreting, carpentry and joinery, electrical installation, furniture and cabinet making, painting and decoration, sheet-metal fabrication, motor vehicle mechanics work, mechanical engineering, radio and television servicing, accounts and commerce, typing and shorthand, and printing.

The fields of study in the polytechnics and colleges of technology are: agriculture and water resources, art and printing, engineering and technology, environmental studies, laboratory science and medical technology, accountancy, banking and insurance, administration and management studies, secretarial studies, catering/food technology, and education for the following certificates: National Certificate of Education, National Technical Teachers Certificate, and Technical Teaching Certificate.

Unemployment and Underemployment of Nigeria Technical Education Graduates

Employment estimates indicate that unlike that in the past Plan period, additional manpower requirements with respect to various occupations are by far lower than the existing stock (National Rolling Plan, 1992, p. 189).

> Unemployment has given the least response to the economic recovery measures over the years. Unemployment rose from 4.3% in 1976 to 9.7% in 1984 and 12.7% in 1985. The unemployment situation can be largely attributed to the fast growing labor market (on account of the increasing number of school leavers) the slow rate of growth of investment and the constraint imposed by the securing of necessary capital goods and spares. (First Rolling Plan, 1990, p. 9)

The National Rolling Plan published that there is evidence of a growing "over-supply" of certain vocational and technical education program graduates, particularly in environmental studies, agriculture and forestry, and administration and management. This was revealed from the 1984 follow-up study of polytechnics and technical college graduates conducted by the Manpower Board in 1986 that more than two-fifths of the respondents had not secured jobs 1 year after serving the National Youth Corps. This situation contrasts sharply with the early 1970s when there was no evidence of serious vocational and technical education graduate unemployment in almost all the disciplines (p. 187). Statistical News of the Federal Office of Statistics, 1993, published a Labor Force Survey where unemployment by educational level showed that there was an unemployed level of 2.7-6.7 between September 1992 and December 1992 for those with an educational level higher than secondary schools. (See Appendix C on National Unemployment Rates, December 1985-December 1992).

Shortage of Certain Critical Skills

The National Rolling Plan, 1991-1993, states:

> In the midst of large-scale unemployment of Nigeria labor force, there are also clear indications that the economy is still in short supply of certain categories of critical manpower, particularly those possessing scientific and technical knowledge and skills. It was published in the results of the 1986 study of Nigeria's Manpower Stock and Requirements, that high rates of vacancies for certain categories of

> workers, particularly in the field of agriculture, electrical and electronics, metallurgy, etc., continue to exist in the economy to-date. Other manpower categories for which high vacancy rates were also reported include, amongst others, land surveyors, some categories of medical related workers, as well as teachers of mathematics, physics, and technical and vocational subjects. This survey also revealed the existence of high vacancy rates for certain categories of technicians and craftsmen in the field of medicine and para-medical sciences, engineering and technology. (p. 2:199)

The findings of Nigeria Employment Tracer studies support this report and that of the Labor Force Sample surveys. All these studies reveal that the rate of unemployment has risen substantially in both urban and rural areas of Nigeria. The incidence of unemployment, according to these studies, is no longer limited to youths ages 15-24 years, but covers adults, including graduates of tertiary institutions--universities, polytechnics, and colleges of education.

The simultaneous existence of high levels of unemployment and vacancy rates in various occupations is, to a large extent, attributable to lack of alignment of education and training programs strictly to meet the manpower requirements of the labor market. It also underscores the need for career guidance and counseling, especially at the secondary and vocational schools, to strengthen the labor market information system, to help identify available job opportunities in the various occupations, and to enable the curriculum developers to update curricula to reflect industrial and community needs.

Summary

The discovery of crude oil (petroleum) in Nigeria brought about the slogan "transfer of technology" for the development of indigenous manpower requirements. Other slogans such as "operation feed the nation" and "green revolution" were coined for mechanized agriculture to enable the country to be self-sufficient. A shift was made for the development and expansion of vocational and technical education in order to meet the manpower needs of the industry and to enable Nigeria to achieve the aims and objectives of the Fourth National Development Plan. Governments have made human, materials, and financial efforts to meet the developmental needs of the Nigerian people.

Nigeria has come a long way from the colonial education era to the present status of vocational and technical education in the country. Government documents and government-appointed commissions' reports and publications provided information with regard to the aims, objectives, and priorities expressed and the actions taken by various governments of Nigeria towards the development and the expansion of educational programs. These documents and publications provided authentic information and the needed statistics which are related to the present status of vocational and technical education programs in Nigeria. Existing institutions have been expanded and new vocational

and technical education institutions established. The National Commission for Colleges of Education, Minimum Standard was approved for teacher certification. The National Rolling Plan was launched in 1990. The importance that the government attached to education has been demonstrated in the large increase in funds allocated yearly to education in Nigeria. There are bilateral arrangements between the Nigerian government and foreign governments for educational assistance, and training of Nigerian vocational and technical educators and technicians in their home countries. Books, journals, periodicals, and dissertations were other sources for gaining insight into the needs of vocational education in Nigeria. These studies provided information on the advent and progress of technical education, but none on the adequacy of the programs and the problems that administrators face in staffing them.

CHAPTER III

METHODS AND PROCEDURES

Introduction

The purpose of this study was to examine the status and perceived adequacy of vocational and technical education programs in Nigeria and the problems administrators face in staffing the programs. The study also investigated the perception of Nigerian vocational and technical educators and selected industrial personnel regarding the adequacy of the programs in meeting the intended aims and objectives of vocational and technical education, and that of the economic and social demands of Nigerian industry. This study hoped to provide empirical data to vocational and technical education policy makers to look at potential solutions to the problems associated with the administration of vocational and technical educational programs.

This chapter covers the analysis of the survey data, interview data, documents, and the procedures used for the study.

Research Designs

The research design employed in this study was primarily the survey method. The survey technique which

provided the primary source of information entailed the construction of the interview and survey questionnaire instruments. The interview questions were intended to gather information pertaining to conditions of employment, hiring practices, nature of Nigerian graduates in technical programs (knowledge, skills, and attitudes), adequacy of the output of technical programs in meeting the industrial market demands, organizations' contributions to industrial training experience, curriculum revision, and updating of vocational programs from the Nigerian industrial personnel. Government-published documents were also used as a secondary source of information in the review of related literature, analysis of contents of government policies, objectives and priorities as published in the Federal Development Plans and perusal of the Federal Ministry of Education publications.

A survey questionnaire was constructed with the objective of examining the opinions and perceptions of Nigerian vocational and technical educators on the curriculum, content, staffing, and administration of technical education. The data collected were also used to examine differences in the perceptions of administrators and lecturers in vocational and technical education.

Population and Samples

The samples used for survey in this study were drawn from the population of Nigerian vocational and technical educators. Six selected executives in various trade

industries were interviewed. One hundred subjects comprising lecturers, instructors, department heads, administrators of polytechnics and vocational/technical institutions, and officers of the Ministry of Education were selected for the survey in all the institutions visited by the investigator. The introduction letter from the chairman of the dissertation committee was shown to all the heads of institutions visited. The purpose of the visit was explained. These vocational and technical educators were selected because of their positions, involvement, and experience in the administration and teaching occupations in Nigeria vocational and technical institutions. Vocational educators were selected because they are involved in the training of vocational teachers and the administration of vocational programs in Nigeria.

Six executives in various vocational industries were selected for the interview because of their position as the avenue for supervised industrial work experience of the trainees and as the employers of the output of Nigeria's vocational and technical education programs. They were selected from different geographical locations of the country. They contributed positively to this study by making their opinions known via interview about the perceived adequacy of the graduates of Nigeria vocational and technical education programs in meeting the industrial market needs.

Development and Administration of the Instrument

The instrument used in this study was a modified American Vocational Association Questionnaire on the critical issues of vocational and technical education (AVA National Survey, 1985, pp. 44-46). The development of this questionnaire was preceded by an intensive search for an instrument that would be adequate and comprehensive enough to produce reliable and valid information regarding the present status of vocational and technical education in Nigeria. The review of the literature on comparative technical education provided information about the close link between vocational and technical education in the United States of America and that of Nigeria.

The draft of the questionnaire was submitted to the dissertation committee members for their review and comments. Their observations were useful in the development of an improved questionnaire. The involvement and contributions of the dissertation committee members after the preliminary defense of the proposal of this study helped to refine the instrument and ensured that the instrument covered all the areas that the study set out to investigate. The revised questionnaire consisted of two instruments. The two instruments developed were a survey questionnaire and a structured interview questionnaire (see Appendix B). The survey questionnaire examined three areas of vocational and technical education in Nigeria as perceived by the

educators: curriculum, contents, staffing, and administration.

1. The curriculum entailed the following: goals and objectives of curriculum, nature and scope of programs, grade placement, time allotment, responsiveness of curriculum to Nigeria's economic and social demands, student counseling and services, textbooks, laboratory facilities, laboratory equipment, industrial practical experience, and the involvement of teachers, industries, and curriculum specialists in curriculum development.

2. The contents entailed the following: student knowledge of basic technical information, student knowledge of specialized information, graduates' proficiency on the job, supervisory skills of graduates, organizational skills, human relation skills, general education skills in English, mathematics, social studies, and health science, periodic evaluation of curriculum, and overall rating of vocational and technical education programs.

3. Staffing and administration entailed: the availability of technically and pedagogically competent teachers, certification standards for teachers and administrators, in-service and staff development programs for teachers, opportunities for potential teachers, remuneration and wages, scholarships and bursaries, teachers' involvement in goal-setting, planning, operation, and professional organization, number of technically competent administrators, supervisors and counselors,

short-range and long-range goals and objectives, organization and administration of programs, funding programs, and the quota system of allocating resources.

The questionnaire was hand-delivered to purposefully selected technical educators of Nigeria's vocational and technical institutions and the Ministry of Education.

The interview format consisted of questions to survey the opinions of selected executives, personnel managers, directors, and/or supervisors of selected major industries in Nigeria looking at these areas:

1. Conditions of employment
2. Hiring practices
3. Nature of students graduating from Nigerian vocational education programs (knowledge, skills, and attitudes)
4. Adequacy of the output of Nigerian vocational and technical education programs meeting industrial market demands
5. Organization's contribution to industrial training experience, curriculum revision, and updating of vocational programs in Nigeria.

Procedures

After the survey instrument was approved by the dissertation committee, I traveled to Nigerian institutions for consultation and administration of the survey instrument. I visited 13 technical and vocational

institutions in Lagos, Enugu, Ibadan, Ado-Ekiti, and Kaduna in Nigeria to distribute the survey instrument (see Appendix B). The institutions visited and the number of copies of questionnaires distributed were:

1. Government Technical College, Yaba, 10
2. Lagos College of Science and Technology, Lagos, 10
3. National Technical Teachers College, Akoka, 10
4. Yaba College of Technology, Yaba, 10
5. Federal Polytechnic, Ado-Ekiti, 5
6. Ibadan Polytechnic, Ibadan, 10
7. Kaduna Polytechnic, Kaduna, 5
8. National Board for Technical Education, Kaduna, 5
9. Ahmadu Bello University, Zaria, 5
10. Federal Polytechnic, Idah, 10
11. University of Nigeria, Nsukka, 10
12. Federal Ministry of Education Science and Technology, Ikoyi, 5
13. Institute of Management and Technology, Enugu, 5

The purpose of my visit was explained. The letters of introduction from the committee chairman and the researcher (Appendix A) were presented to the sample of selected vocational administrators and heads of department in their offices. After gaining the permission of the heads of departments, provosts, principals, and department

chairmen in the institutions visited, I gave the questionnaires to selected administrators, senior lecturers, senior education officers, and senior technical instructors with either the assistance of the school head or the selected representative.

The sample of vocational administrators and lecturers was selected through a staff representative suggested by the heads or principals in each institution visited. Each representative was requested to distribute, coordinate the collection, and the forwarding of completed questionnaires to the researcher in Lagos. The heads of department, provosts, department chairmen, or principals of some of the selected institutions in different states agreed to assist me in collecting and forwarding completed questionnaires to my address in Lagos. Self-addressed, stamped manila envelopes were submitted for this. An accompanying letter from the investigator guaranteed anonymity and confidentiality, and the best date for all respondents to turn in their responses. The selected staff member in any institution outside Lagos state, chosen by me upon the suggestion of the principal or head of department, was given some money to cover the postage fee of the completed questionnaires collected to my address in Lagos.

Other subjects were selected through a staff member in each industry or Ministry of Education visited by me to administer and forward all completed questionnaires to my address in Lagos. At Government Technical College, Yaba,

Lagos College of Science and Technology, Lagos, and National Technical Teachers College, Akoka, the administration of the questionnaire was done by the provost or principal of the institution where I was able to make another visit at a later date to collect the completed questionnaires. At the other institutions, the administration of the questionnaire was undertaken by a staff member, other than the head of the institution, specially selected by the recommendation of the principal or head and advised by the investigator regarding the collection of the questionnaires and where to mail them. A large self-addressed, stamped manila envelope was supplied to every selected staff member.

Ninety-five questionnaires were returned by either hand collection, through the mails, and personal visitations from two of the selected staff representatives. However, five questionnaires among the ones distributed in the eastern states were missing.

The interview of selected personnel from major industries was done during my visit to some of the technical institutions located in the same geographical area. Those selected were personnel managers, directors, and supervisors. The industries visited were selected because they are involved in the industrial attachment experience of the students while in training and they employ graduates of various disciplines of Nigerian vocational education programs.

I explained to the executives visited the purpose of the interview, and a time and date was arranged for the interview. The executives were interviewed in their offices on the scheduled date and time. Those executives who thought that I was a disguised news reporter were shown my traveling passport, school identification card, and were approached by speaking in the native dialect so as to gain their confidence and their true opinions to ensure that biases did not result. I guaranteed anonymity and confidentiality of responses and respondents. All the executives interviewed believed in the research goals and that the responses were aimed at providing accurate and sincere data. The sessions were tape-recorded with their permission. Executives in industry were purposefully selected by virtue of their position and experience and because they were the employers of the output of Nigeria's vocational and technical programs. Those interviewed were: the Director of Personnel, Nigerian Electric Power Authority, Training Section, Ijora; the Training/Workshop Manager, U.A.C. Technical M & E Section, Iddo; the Contract Director, Seal Construction Company, Kaduna; the Director for Productions, Federal Institute of Industrial Research, Oshodi; Chief Maintenance Officer, Federal Ministry of Works and Housing, Lagos; and the Farm Manager, Owena Farms and Poultry, Inc., Otta. The interviews were analyzed by content analysis and the theme of each question asked on different areas was compared with that of the educators to

examine adequate corroboration and similarity in the expressed opinions of the majority in the two groups.

The secondary sources of information used were selected documents published by the Federal Ministry of Education (Technical Section), Gazette publication of vocational and technical education enrollments and the graduates. Also used was the First National Rolling Plan 1990-1992 published by the Planning Office, Labor Sector, Federal Ministry of Budget and Planning, Lagos; and Statistical News by the Federal Office of Statistics on Labor Force Survey about the Magnitude of Employment and Unemployment, 14th April, 1993. I used these documents for this study because they were the latest concise published data on the graduates and labor force survey of the employed and unemployed of Nigeria by educational level, age group, and sex.

I visited the Federal Office of Statistics, Broad Street, Lagos; the National Board for Technical Education in Kaduna, the body that determined the general skills and middle-level manpower needs of the country in the industrial, commercial, and other relevant fields; and the Federal Ministry of Education Technical Section, Victoria Island, Lagos, to collect relevant documents. From a thorough examination of the contents of the gathered government official publications, and the perusal of the reviewed literature, pertinent information and statistics were gathered on the following areas:

1. The intended aims and objectives of technical education as published by the Nigerian Government Policy of education

2. The number of schools, enrollment trends, and the output in Nigerian secondary schools, post-secondary institutions, vocational and technical institutions, polytechnics, and teacher-training institutions (The curricula of vocational and technical education for N.C.E. Technical Teachers certificate, ND/HND on Agricultural Engineering Technology, Civil Engineering Technology, and Mechanical Engineering Technology, were selected because agriculture, technology and manufacturing sectors, and teachers' programs were the bulk of envisaged gainful employment areas of the nation.)

3. Statistics and number of available workforce produced, qualifications, manpower requirements for meeting the needs of the industrial sector, employment and unemployment, shortages and wastage of the educational sector, and the estimated additional requirements on the basis of expected enrollment targets.

Analysis of the Data Collected

Analysis of Data

Five specific purposes with respect to vocational and technical education in Nigeria were examined in this study. They were to:

1. outline the intended objectives of vocational and technical education in Nigeria;

2. examine to what extent the vocational and technical education in Nigeria is adequate as perceived by selected administrators and teachers;

3. determine if there are differences in the perception of adequacy between administrators and lecturers of vocational and technical education programs;

4. examine if the perception of adequacy is related to the size of the institution;

5. examine if the perception of adequacy is related to the type of institution.

For Purpose 1, the objectives of vocational and technical education were obtained through the perusal of government documents. They were outlined in chapter 2 and summarized in chapter 4.

The data for Purposes 2 through 5 were obtained using a survey questionnaire (Appendix B). The perceived adequacy of vocational and technical education in Nigeria was examined in the context of adequacy in three areas: curriculum, content, and staffing and administration. Specific items in these three areas were rated as Very Adequate, Adequate, Inadequate, and Cannot Be Determined. They were coded 4, 3, 2, and 1 respectively. Preliminary examination of the data showed that no one chose Very Adequate (4) in any of the items. Between 1 and 6 respondents marked Cannot Be Determined (1) for the

following 12 items (B3, B4, B1C, B11b, B11c, B13, B14, B21a, B21b, B22, B27a, and 28). For the purpose of this study, the small number of Cannot Be Determined (1) was combined with Inadequate (2). This appeared to be reasonable since most respondents rated most of the item as Inadequate. Consequently, only two ratings were used: Adequate or Inadequate.

For Purpose 2, percentages of Adequate responses were computed. For Purposes 3, 4, and 5, chi-square statistics were computed to test for differences between the perceptions of administrators and lecturers, relationships between perceived adequacy, and size and type of institutions. The level of significance was set at 0.05. The probabilities associated with x^2 values were used to indicate the results of tests of significance.

Analysis of Interview Data

The executives were interviewed and the sessions were tape-recorded with their permissions. The interview sought the opinions of selected executives, personnel managers, directors and/or supervisors of selected major industries in Nigeria looking at these areas: conditions of employment; hiring practices; nature of students graduating from Nigerian vocational education programs (knowledge, skills, and attitudes); adequacy of the output of Nigerian vocational and technical education programs meeting industrial market demands; organization's contribution to

industrial training experience, curriculum revision and updating of vocational programs in Nigeria. The collected data were noted by the content analysis and the theme of responses to each specific question asked on different areas was analyzed.

The number of interviewed executives who felt that each of the questions was either adequate or inadequate were noted. The number of industrial executives who expressed the opinion or whose responses rated the question as adequate or inadequate was compared to the frequency and/or percentage of the selected vocational educators on the data collected from the survey responses on similar questions in the questionnaire responses of the selected vocational educators. The opinions that were similar or corroboratory were used narratively to describe the adequacy or inadequacy of vocational and technical education programs in the industry as well as meeting the intended objectives of the programs.

Summary

The purpose of this chapter was to establish the procedure and methods that were used in this study. It discussed the status and perceived adequacy of vocational and technical education programs in Nigeria. It included the research design, population and sample, and procedural approach used in the study. Five problem areas were provided and discussed:

1. Outline the intended objectives of vocational and technical education

2. Examine to what extent the technical education program in Nigeria is adequate in meeting the intended objectives

3. Determine if there are differences in the perception of adequacy between administrators and lecturers

4. Examine if the perception of adequacy is related to the size (population) of institution

5. Examine if the perception of adequacy is related to the type of institution.

The extent to which the vocational and technical education program is adequate was examined in the context of the adequacy of curriculum, contents, staffing and administration of vocational and technical programs.

CHAPTER IV

ANALYSIS OF FINDINGS

Introduction

This study examined the status and perceived adequacy of vocational and technical education programs in Nigeria and the problems that administrators face in staffing those programs. The study was also done to determine to what extent the vocational program output has been fulfilling the set objectives of the development plan and that of industrial manpower demands. The study aimed to provide a basis to get the vocational and technical education policy makers to look at solutions to the problems of the inadequacy and/or inappropriateness of the vocational and technical education programs.

Chapter 4 presents descriptive information on the survey respondents, the demographies, the return rate of the survey instrument, number of selected industrial executives interviewed, their positions, and the companies they represent.

The analyses of findings are discussed under the following subheads: curriculum, contents, staffing and administration. The perceptions of the selected vocational

and technical educators' responses, statistical data of responses, and specific information from secondary sources were used in the analysis.

Demographic Information

In this study, purposive sampling was used in selecting the respondents. One hundred Nigerian vocational and technical educators were selected. Ninety-five completed questionnaires were returned. The questionnaires were sent to educators comprised of provosts, principals, executives in the Ministry of Education, heads of departments, instructors, teachers, education officers, technical education officers, and lecturers. The majority of the educators (87 out of 95, or 91.6%) were university graduates.

Regarding the respondents, Table 4 shows that 51 out of the 95, (53.7%) respondents were administrators, provosts, principals, or heads of departments. The remaining 44 (46.3%) were lecturers, instructors, or education officers. Forty-eight of the 95 (50.5%) respondents had a master's degree or a doctorate degree, whereas 39 (41.1%) had either a bachelor's degree or Higher National Diploma (H.N.D.) certificate. Regarding the experience on the job, 72 out of the 95 (75.8%) respondents had over 8 years of experience, and the other 19 had between 4 and 8 years of experience. Four (4.2%) of the educators had between 1-4 years of experience. None of the educators

TABLE 4

PERSONAL DEMOGRAPHIC INFORMATION

Variable	N	%
Position		
Administrator[a]	51	53.7
Lecturer[b]	44	46.3
Qualification		
Postgraduate	48	50.5
Graduate	39	41.1
Technical Certificate	4	4.2
Academic Certificate	4	4.2
Work experience		
8 years and above	72	75.8
4-8 years	19	20.0
1-4 years	4	4.2
1 year or less	0[d]	0.0
T.T.T.P.[c] Beneficiary		
Yes	30	31.6
No	65	68.4

[a]Administrators include Provosts, Principals, Executives in the Ministry of Education, and Heads of Department.

[b]Lecturers include Instructors, Teachers, Education Officers, and Technical Education Officers.

[c]TTTP Technical Teacher Training Program--Nigerian Scholarship run by the American International Development Reimbursable Training Program.

[d] Indicates that none of the educators surveyed in this group had less than 1 year of experience.

surveyed had less than 1 year of experience. Only 30 out of the 95 respondents were beneficiaries of the Technical Teacher Training Programs sponsored under the auspices of the United States Agency for International Development. (TTTP was an agreement signed in September 1981 between the United States of America and the Federal Government of Nigeria to embark on a cooperative program through which Nigerian vocational and technical educators, selected industrial personnel, and prospective teachers would receive training in American universities leading to degrees in vocational, industrial, technical, agricultural, and business education. Graduates of this program were obligated to go back to Nigeria and serve in different positions in the educational sector at the completion of their programs. This program was fully funded by the Federal Government of Nigeria under the auspices of the American International Development Reimbursable Training Program.)

Table 5 shows that 95 vocational and technical educators who responded to the survey were distributed as follows: 40 out of the 95 educators were affiliated with the college of technology or school of engineering technology, 26 are with the industrial arts and vocational education, and 29 with vocational and liberal education. Thirteen (13.7%) were from the Ministry of Education, 23 (24.2%) were from the university, and 31 (32.6%) of the educators were from the polytechnics or college of technology. Those from

TABLE 5

INSTITUTIONAL DEMOGRAPHIC INFORMATION

Variable	N	%
Type of Institution		
Ministry of Education	13	13.7
University	23	24.2
Polytechnic/College of Technology	31	32.6
College of Education Technical	20	21.1
Secondary School (Tech)	7	7.4
Industrial Company	1	1.1
Number of Students		
Over 3,000	31	33.3
3,000-2,000	20	21.5
2,000-1,000	34	36.6
Under 1,000	8	8.6
Degree Preparation		
Degree Awarding	27	29.0
N.D. & H.N.D.	34	36.6
T.T.C. & N.C.E Diploma	25	26.9
City and Guild Diploma	7	7.5
Departmental Affiliation		
College of Technology School of Engineering	40	42.1
Industrial Arts and Vocational Education	26	26.9
Vocational and Liberal Education	28	29.5
Vocational Programs only	1	1.1

the colleges of education (Technical) numbered 20 (21.1%) of the population, secondary school educators were 7 (7.4%) of the population of educators, and only 1 (1.1%) of the educators was from an industrial company.

There were 31 educators from institutions with more than 3000 students. Twenty educators were from institutions with student populations between 2000 to 3000, 34 educators among the respondents were from institutions with student populations of 1000 to 2000, while the remaining 8 vocational and technical educators surveyed were from institutions with a student population of less than 1000.

Twenty-seven out of the 95 (29%) surveyed educators were from degree-awarding institutions, 34 (36.6%) were from institutions awarding the National Diploma and Higher National Diploma, 25 (26.9%) of the educators were from institutions awarding the Technical Teachers Certificate and National Certificate of Education, and 7 (7.5%) of the educators were from institutions awarding the City and Guild diploma.

Intended Objectives of Vocational and Technical Education

The aims and specific objectives of technical education were discussed in chapter 2 under aims and objectives of vocational and technical education. As a summary, the aims of technical education are:

1. to provide trained manpower in applied science, technology and commerce particularly

at sub-professional grades

2. to provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development

3. to provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man

4. to give an introduction to professional studies in engineering and other technologies

5. to give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant

6. to enable our young men and women to have an intelligent understanding of the increasing complexity of technology. (National Policy on Education, item 49, section 6; p. 28)

The overriding aim of Nigeria's development efforts remains that of bringing about an improvement in the living conditions of the people. A number of specific objectives are, however, woven around this goal. The specific objectives set for the Fourth Plan period are as follows:

1. Increase in the real income of the average citizen

2. More even distribution of income among individuals and socio-economic groups

3. Reduction in the level of unemployment and under-employment

4. Increase in the supply of skilled manpower

5. Reduction of the dependence of the economy on a narrow range of activities

6. Balanced development--that is, the achievement of a balance in the development of the different sectors of the economy and various geographical areas of the country

7. Increased participation by citizens in the ownership and management of productive enterprises

8. Greater self-reliance--that is, increased dependence on our own resources in seeking to achieve the various objectives of society. This also implies increased efforts to achieve optimum utilization of our human and material resource

9. Development of technology

10. Increased productivity; and
11. The promotion of a new national orientation conducive to greater discipline, better attitude to work and cleaner environment. (p. 37)

The specific objectives of technical education were considered in the establishment of each vocational and technical education program. Since education is a dynamic instrument of change, this policy had been constantly reviewed to ensure its adequacy and continued relevance to national needs and objectives.

To What Extent the Vocational and Technical Education Program Is Adequate in Meeting Intended Objectives

The extent to which the vocational and technical education program is adequate in meeting the intended objectives was examined in the context of the perceived adequacy of curriculum, contents, and staffing and administration of vocational and technical programs.

Adequacy of Curriculum

Table 6 indicates the respondents' perceptions of the curriculum. Eighty-seven out of the 95 (91%) vocational and technical educator respondents agreed that the goals and objectives of each vocational and technical education curriculum were adequately defined. The majority, 71 out of 95 (74.7%) educators, believed that the nature and scope of programs were adequate. However, only slightly more than half of the respondents (58.9%) of the vocational and technical educators surveyed rated grade placement as

TABLE 6

CURRICULUM

Item	% Adequate	N
1. Goals and objectives clearly defined	91.6	87
2. Nature and scope of programs	74.7	71
3. Grade placement	58.9	56
4. Time allotment	70.5	67
5. Responsiveness of curriculum to Nigeria's economic and social demands	8.4	8
6. Student counseling and services	5.3	5
7. Textbooks	0.0	0
8. Laboratory facilities	0.0	0
9. Laboratory equipment	0.0	0
10. Industrial practical experience	0.0	0
11a. Involvement of teachers in curriculum development	5.3	5
b. Involvement of the industries in curriculum development	2.1	2
c. Involvement of curriculum specialist in curriculum development	1.1	1

Note: % Adequate = Percentage of respondents who rated item as Adequate. N = Frequency of respondents who rated item as Adequate. 0 indicates that all or 100% of educators surveyed rated item as Inadequate.

adequate. Seventy percent of the educators rated time allotment as adequate. As noted, over 90% of the respondents indicated that the following were inadequate:

1. responsiveness of curriculum to Nigeria's economic and social demands
2. student counseling and services
3. textbooks
4. laboratory facilities
5. laboratory equipment
6. industrial practical experience
7. involvement of teachers, industries, and curriculum specialists in curriculum development.

Only 8 out of the 95 (8.4%) vocational and technical educators rated responsiveness of curriculum to Nigeria's economic and social demands as adequate. Over 90% of the respondents indicated that this item was inadequate, clearly showing that the vocational and technical education program was not responsive to Nigeria's economic and social needs. This corroborated with the responses of five out of six industrial executives interviewed who said that Nigerian vocational and technical education programs were not meeting the manpower needs of Nigerian industries. The inadequacy of student counseling and services, textbooks, laboratory facilities and equipment, practical experience, and the non-involvement of teachers, industries, and curriculum specialists in developing vocational and technical education curriculum were clearly reflected by the reponses of the industrial executives interviewed for this study. They believed that the system of Nigerian vocational and technical education was ill-equipped, lacked competent

technical teaching staff, lacked teaching materials, and did not prepare graduates to fit the job requirements demanded of the new technology. All the industrialists interviewed believed that the graduates of Nigeria's vocational and technical education programs might be theoretically sound but seriously lacking in the practical aspects of the types of jobs available in their manufacturing and production shops.

It appeared the intent of vocational and technical education in Nigeria was adequate, but the curricula were inadequate. It was, therefore, not surprising that its graduates were ill-equipped to perform in industries.

Adequacy of Content

Table 7 shows the percentage of respondents who indicated the adequacy of various aspects of the content of vocational and technical education in Nigeria. Student knowledge of basic technical information was rated adequately by 71 out of the 95 (74.7%) educators in the sample, whereas only 1 out of 95 (1.1%) vocational educators rated student knowledge of specialized technical information as adequate. Ninety-four out of the 95 (98.9%) educators rated this item as inadequate. No wonder that the proficiency of graduates on the job was rated inadequate by 91 out of 95 (95.8%) of the subjects in the survey. Five out of the six executives interviewed in industries had a

TABLE 7

CONTENTS

Item	% Adequate	N
12. Student knowledge of basic technical information	74.7	71
13. Student knowledge of specialized technical information	1.1	1
14. Graduates, proficiency on the job	4.2	4
15. Supervisory skills of graduates	40.0	38
16. Organizational skills	73.7	70
17. Human relation skills	93.7	89
18. General education skills in English, mathematics, social studies, and health science	96.8	92
19. Periodic evaluation of curriculum	2.1	2
20. Overall rating of vocational and technical education programs	2.1	2

Note: % Adequate = Percentage of respondents who rated item as Adequate. N = Frequency of respondents who rated item as Adequate. 0 indicates that all or 100% of educators surveyed rated item as Inadequate.

similar statement when asked how their companies rated the competencies of these Nigerian graduates on specific job assignments. They indicated that the graduates of Nigeria's vocational and technical education programs might be

theoretically sound but seriously lacking in the practical aspects of the types of jobs available in their manufacturing and production shops.

All industrial employers interviewed believed that most of the graduates of Nigeria's vocational and technical education programs, on first entry into a job, were found to be practically unproductive. The companies had to incur extra expenses to retrain the new graduates, often for a minimum of 2 years in the industry before they could be given full responsibilities.

Supervisory skills of graduates were rated as adequate by only 40% of the educators surveyed. Organizational skills, on the other hand, were rated as adequate by over 73% of the subjects surveyed.

Human relation skills were rated as adequate by about 94% of the educators. This looked as if a higher rating was given to the affective domain of Nigerian graduates than the cognitive and practical aspects of their skills. General education skills in English, mathematics, social studies, and health science were rated adequate by over 96% of the vocational educators in the population. Periodic evaluation of vocational and technical education curriculum was also rated inadequate by over 97% of the subjects surveyed. Overall rating of vocational and technical education programs was also considered inadequate by over 97% of the vocational and technical education administrators and lecturers. The selected industrialists

interviewed wanted Nigeria's technical education curriculum to train competent persons in (1) the technology of machines and manufacturing processes, (2) product conceptualization and design, (3) development of local raw material, (4) the design of profitable production systems, (5) the planning and control techniques for the production of commodities, (6) quality-control techniques for all ranges of local industrial products, (7) the use of computers for the efficient production of goods, services, and maintenance, (8) the development of superior species in agriculture, and (9) the processing of agricultural products.

It could be concluded from the perceptions of the educators and industrial executives interviewed that the contents of the curriculum were inadequate for the intended objectives.

Adequacy of Staffing and Administration

Table 8 shows the percentage of respondents who indicated the adequacy of staffing and administration of vocational and technical education institutions. The availability of technically competent teachers and pedagogically competent teachers, respectively, was rated inadequate by over 95% of the vocational and technical educators in the sample. Certification standards for teachers were rated inadequate by all 95 educators, while certification standards for administrators were also rated

TABLE 8

STAFFING AND ADMINISTRATION

Item	% Adequate	N
21a. Availability of technically competent teachers	4.2	4
b. Availability of pedagogically competent teachers	2.1	2
22a. Certification standards for teachers	0.0	0
b. Certification standards for administrators	21.1	21
23. In-service and staff development programs for teachers	7.4	7
24. Opportunities for potential teachers	27.4	26
25. Remuneration and wages	0.0	0
26. Scholarships and bursaries	2.1	2
27a. Teachers' involvement in goal-setting	8.4	8
b. Teachers' involvement in planning	9.5	9
c. Teachers' involvement in operation	10.5	10
28. Teachers' involvement in professional organization	5.3	5
29. Teachers' opportunities for continuing education	33.7	33

Table 8--Continued.

30. Number of technically competent:		
a. Administrators	4.2	4
b. Supervisors	3.2	3
c. Counselors	3.2	3
31a. Short-range goals and objectives	60.0	57
b. Long-range goals and objectives	2.1	2
32. Organization and administration of programs	12.6	12
33. Operation of programs	7.4	7
34. Funding of programs	0.0	0
35. Quota system of allocating resources (human and materials)	1.1	1

Note: % Adequate = Percentage of respondents who rated item as Adequate. N = Frequency of respondents who rated item as Adequate. 0 indicates that all or 100% of educators surveyed rated item as Inadequate.

inadequate by almost 80% of the educators, administrators, and lecturers. In-service and staff-development programs for teachers were rated inadequate by over 90% of the educators surveyed.

Remuneration and wages were rated inadequate by all 95 vocational and technical educators who responded. That might be the reason why a lot of the technically competent potential teachers were going into industrial services rather than making a career in the teaching profession.

Scholarships and bursaries were rated inadequate by over 95% of the subjects in the population. Teachers' involvement in goal-setting, planning, and operation was rated as inadequate by over 90% of the subjects surveyed. Teachers' involvement in professional organization was also rated inadequate by over 90% of the educators. Teachers' opportunity for continuing education was rated inadequate by over 65% of the subjects. The educators' rating of all these items as inadequate might be a pointer to the unavailability of technically and pedagogically competent teachers. Five of the six industrial executives interviewed believed that the system of Nigerian education was ill-equipped and lacked competent technical teaching staffs.

The number of available technically competent administrators, supervisors, and counselors was rated inadequate by over 95% of the vocational and technical educators surveyed. Sixty percent of the educators indicated that short-range goals and objectives were adequate, while only 2% indicated that long-range goals and objectives were adequate. Organization and administration of programs were rated inadequate by over 87% of the population. Operation of programs was rated adequate by only 7 of the 95 (7.4%) educators, while over 90% of the subjects rated operation of programs as inadequate. Clearly this supported the contention of four of the six industrialists interviewed, calling the organization and administration of vocational and technical education in

Nigeria as confusing and chaotic. Funding of vocational and technical education programs was rated inadequate by all 95 vocational and technical educator respondents. Five of the six industrial executives interviewed, whose companies had their own training schools, responded to the interview question on whether or not the company was contributing to vocational and technical education. They believed that it was more beneficial to their organization to train their own employees on the job than to contribute to the educational system where its graduates had to be retrained for a period of not less than 1 to 2 years before they could perform the job requirements demanded of their qualifications. The quota system of allocating resources (human and materials) was rated inadequate by over 98% of all the educator respondents. This showed that staffing and administration were inadequate in meeting intended objectives of vocational and technical education.

From the aforementioned perceptions of the vocational and technical educators, the strength of the vocational and technical program could be seen in the high percentage of agreement in the adequacy of goals and objectives of the curriculum, nature and scope of programs, and student knowledge of basic technical information, general education skills in English, mathematics, social studies, and health science. The weak points of the programs were the inadequacy of the curriculum in terms of the textbooks, laboratory facilities, laboratory equipment,

industrial practical experience, and the lack of involvement of the teachers, industry, and curriculum specialist in curriculum development. The contents showed many important weak areas such as student knowledge of specialized technical information, graduates' proficiency on the job, and periodic evaluation of curriculum; and the vocational and technical education programs were rated overall as inadequate. Unavailability of technically and pedagogically competent teachers, certification standard for teachers and administrators, remuneration and wages, scholarships and bursaries, operation, organization and administration of programs, funding of programs, and the quota system of allocating resources were the weakest points contributing to the inadequacy of meeting the intended objectives.

The inadequacy of many critical areas in curriculum, contents, and staffing and administration of programs resulted in educational experiences that obviously were not responsive to both labor-force needs and economic and sociopolitical requisites.

Perception of Adequacy Between Administrators and Lecturers of Vocational and Technical Education Programs

The respondents included 51 administrators and 44 lecturers. Tables 9-11 show the percentage of respondents (administrators and lecturers) who rated each item under curriculum, contents, and staffing and administration as adequate. Also included are the chi-square values of each

TABLE 9

PERCENTAGE OF RESPONDENTS (ADMINISTRATORS AND LECTURERS) WHO RATED ITEMS UNDER CURRICULUM AS ADEQUATE

Item	ADMINISTRATOR (N=51)	LECTURER (N=44)	X^2	Prob
1. Goals and objectives clearly defined	94.12	88.64	0.920	0.337
2. Nature and scope of programs	78.43	70.45	0.796	0.372
3. Grade placement	64.71	52.27	1.509	0.219
4. Time allotment	78.43	61.36	3.310	0.069
5. Responsiveness of curriculum to Nigeria economic and social demands	11.76	4.55	1.596	0.206
6. Student counseling and services	3.92	6.82	0.397	0.528
7. Textbooks	0.00	0.00	0.000	--
8. Laboratory facilities	0.00	0.00	0.000	--
9. Laboratory equipment	0.00	0.00	0.000	--
10. Industrial practical experience	0.00	0.00	0.000	--
11a. Involvement of teachers in curriculum development	7.84	2.87	1.470	0.225
b. Involvement of the industries in curriculum development	3.92	0.00	1.763	0.184
c. Involvement of curriculum specialist in curriculum development	1.96	0.00	0.872	0.350

Note: Adequate or Inadequate were reported since no one chose Very Adequate. 0 indicates that all (100%) of the educators surveyed in this group believed the items were inadequate. X^2=Chi-Square Values. Degrees of freedom (df) = 1.

TABLE 10

PERCENTAGE OF ADMINISTRATORS AND LECTURERS WHO RATED ITEMS UNDER CONTENTS AS ADEQUATE

Item	ADMINISTRATOR (N=51)	LECTURER (N=44)	X^2	Prob*
12. Student knowledge of basic technical information	80.39	68.18	1.865	0.172
13. Student knowledge of specialized technical information	1.96	0.00	0.872	0.350
14. Graduates' proficiency on the job	3.92	4.55	0.023	0.880
15. Supervisory skills of graduates	31.37	50.00	3.415	0.065
16. Organizational skills	72.55	75.00	0.073	0.787
17. Human relation skills	92.16	95.45	0.434	0.510
18. General education skills in English, mathematics, social studies, and health science	96.08	97.73	0.210	0.647
19. Periodic evaluation of curriculum	3.92	0.00	1.763	0.184
20. Overall rating of vocational and technical-education programs	1.96	2.27	0.011	0.916

Note: 0 indicates that all or (100%) of the educators surveyed in this group believed the items were inadequate. X^2=Chi-Square Values. Prob* indicates the Probability Values. Degrees of freedom (df) = 1.

item, which are used to show whether there were any significant differences in the perceptions of the vocational and technical education administrators and lecturers. Table 9 presents the percentages of administrators and lecturers who rated items related to curriculum issues as adequate. All chi-square values are not statistically significant at the 0.05 level, suggesting that the

TABLE 11

PERCENTAGE OF ADMINISTRATORS AND LECTURERS WHO RATED ITEMS UNDER STAFFING AND ADMINISTRATION VERY ADEQUATE OR ADEQUATE

Item	ADMINISTRATOR (N=51)	LECTURER (N=44)	X^2	Prob*
21a. Availability of technically competent teachers	7.84	0.0	3.603	0.058
b. Availability of pedagogically competent teachers	3.92	0.0	1.763	0.184
22a. Certification standards for teachers	0.00	0.0	0.000	--
b. Certification standards for administrators	25.49	18.2	0.733	0.392
23. In-service and staff development programs for teachers	3.92	11.3	1.917	0.166
24. Opportunities for potential teachers	31.37	22.7	0.888	0.346
25. Remuneration and wages	0.00	0.0	0.000	--
26. Scholarships and bursaries	3.92	0.0	1.763	0.184
27a. Teachers' involvement in goal-setting	9.80	6.8	0.273	0.601
b. Teachers' involvement in planning	9.80	9.1	0.014	0.906
c. Teachers' involvement in operation	11.76	9.1	0.179	0.672
28. Teachers' involvement in professional organization	3.92	6.8	0.397	0.528
29. Teachers' opportunities for continuing education	39.22	29.5	0.974	0.324
30. Number of technically competent:				
a. Administrators	5.88	2.3	0.763	0.382
b. Supervisors	3.92	2.3	0.210	0.647
c. Counselors	3.92	2.3	0.210	0.647
31a. Short-range goals and objectives	64.71	54.5	1.016	0.313
b. Long-range goals and objectives	3.92	0.0	1.763	0.184
32. Organization and administration of programs	13.73	11.3	0.119	0.730
33. Operation of programs	9.80	4.5	0.957	0.328
34. Funding of programs	0.00	0.0	0.000	--
35. Quota system of allocating resources (human and materials)	1.96	0.0	0.972	0.350

Note: X^2=Chi-Square Values. 0 indicates that (100%) of the educators surveyed in this group believed the items were inadequate. Prob* = Probability Values. Degrees of freedom (df) = 1.

perceptions of lecturers and administrators are similar with regard to contents.

Tables 10 and 11 also show the percentages of administrators and lecturers who rated contents, and staffing/administration items as adequate. No chi-square values are statistically significant at the 0.05 level.

These results clearly indicate that administrators and lecturers do not differ in their perceptions of the adequacy or inadequacy of the curriculum, contents, and staffing/administration of Nigeria's vocational and technical institutions.

Perception of Adequacy in Relation to Size of Institution

Institutions were grouped into three sizes. These were institutions having a student population over 3000 (large), between 2000-3000 (medium), and under 2000 (small). There were 31 vocational and technical educators from large institutions, 20 from medium-size institutions, and 44 from small institutions. Tables 12-14 compare the responses of the vocational and technical educators from the three types (by size) of vocational and technical institutions. In Table 12, the percentages of educators who rated the items related to curriculum as adequate are presented. Significant differences were found for nature and scope of programs, grade placement, and time allotment. No other

TABLE 12

PERCENTAGE OF RESPONDENTS BY SIZE OF INSTITUTION WHO RATED ITEMS UNDER CURRICULUM AS ADEQUATE

Item	Under 2000 (N=44)	2000-3000 (N=20)	Over 3000 (N=31)	X^2	Prob
1. Goals and objectives clearly defined	86.36	100.00	93.55	3.547	0.170
2. Nature and scope of programs	54.55	95.00	90.32	17.839	0.000**
3. Grade placement	31.82	90.00	77.42	25.722	0.000**
4. Time allotment	50.00	90.00	87.10	16.662	0.000**
5. Responsiveness of curriculum to Nigeria economic and social demands	2.27	15.00	12.90	4.087	0.130
6. Student counseling and services	2.27	15.00	3.23	4.850	0.088
7. Textbooks	0.00	0.00	0.00	0.00	--
8. Laboratory facilities	0.00	0.00	0.00	0.00	--
9. Laboratory equipment	0.00	0.00	0.00	0.00	--
10. Industrial practical experience	0.00	0.00	0.00	0.00	--
11a. Involvement of teachers in curriculum development	4.55	5.00	6.45	0.136	0.934
b. Involvement of industries in curriculum development	2.27	0.00	3.23	0.625	0.732
c. Involvement of curriculum specialist in curriculum development	0.00	0.00	3.23	2.086	0.352

Note: X^2 indicates Chi-Square Values. Prob* = probability values. ** indicates that this item was significant at the 0.05 level. Degrees of freedom (df) = 2.

items were found to be statistically significant at the 0.05 level.

Item 2, nature and scope, was rated as adequate by over 90% of the educators from medium and large institutions, compared to only 55% of the educators from small institutions. Item 3, grade placement, was rated as inadequate by over 65% of the educators from small institutions, compared to 90% of the educators from medium-size institutions, and 77.42% from large institutions who rated this item as adequate. Time allotment, item 4, was rated as adequate by over 85% of the educators from medium and large institutions, whereas 50% of the educators from small institutions rated this item as inadequate. These results indicate that the nature and scope of programs, grade placement, and time allotment were perceived to be less adequate in small schools (under 2000 students) than in medium (2000-3000 students) and large (over 3000 students) institutions. This might be due to the fact that the educators from medium and large institutions were from higher educational programs and degree-awarding institutions. The respondents from institutions with under 2000 students, on the other hand, were from the technical high schools and the industries.

Table 13 indicates the percentage of respondents by size of institution who rated items under content as adequate. Only item 15, supervisory skills of the graduates, showed significant difference in the perceptions

TABLE 13

PERCENTAGE OF RESPONDENTS BY SIZE OF INSTITUTION WHO RATED ITEMS UNDER CONTENT AS ADEQUATE

Item	Under 2000 (N=44)	2000-3000 (N=20)	Over 3000 (N=31)	X^2	Prob
12. Student knowledge of basic technical information	65.91	90.00	77.42	4.402	0.111
13. Student knowledge of specialized technical information	2.27	0.00	0.00	1.171	0.557
14. Graduates' proficiency on the job	2.27	10.00	3.23	2.146	0.342
15. Supervisory skills of graduates	56.82	35.00	19.35	10.899	0.004**
16. Organizational skills	77.27	70.00	70.97	0.550	0.760
17. Human relation skills	90.91	100.00	93.55	1.922	0.383
18. General education skills in English, mathematics, social studies, and health science	93.18	100.00	100.00	3.591	0.166
19. Periodic evaluation of curriculum	0.00	0.00	6.45	4.218	0.121
20. Overall rating of vocational and technical education programs	4.55	0.00	0.00	2.368	0.306

Note: X^2=chi-square values; Prob* indicates probability values. ** indicates that this item was significant at the 0.05 level. Degrees of freedom (df) = 2.

of the educators from institutions with less than 2000 students and those educators from medium and laege institutions. Approximately 57% of the educators from small institutions rated this item as adequate, as compared to only 35% of educators from medium-size institutions, and 19% from large institutions. A significantly larger proportion of educators from medium and large institutions (65% and 80% respectively) rated the supervisory skills of the graduates as inadequate. This might be because educators from medium and large institutions were in the degree-awarding institutions, whereas respondents from small institutions were from industries and high schools where graduates were employed as technicians, instructors in high schools, or industrial-arts teachers.

Table 14 presents the percentage of respondents by size of institution who rated items under staffing and administration as adequate.

Significant differences among the three types of institutions (by size) were found for five areas: availability of technically competent teachers, in-service and staff-development programs for teachers, opportunities for potential teachers, teachers' involvement in professional organization, and teachers' opportunities for continuing education.

All (100%) of the educators in small and medium-size institutions as compared to 87% from large institutions rated item 21a,

TABLE 14

PERCENTAGE OF RESPONDENTS BY SIZE OF INSTITUTION WHO RATED ITEMS UNDER STAFFING AND ADMINISTRATION AS ADEQUATE

Item	Under 2000 (N=44)	2000-3000 (N=20)	Over 3000 (N=31)	X^2	Prob
21a. Availability of technically competent teachers	0.00	0.00	12.90	8.621	0.013**
b. Availability of pedagogically competent teachers	0.00	0.00	6.45	4.218	0.121
22a. Certification standards for teachers	0.00	0.00	0.00	0.00	--
b. Certification standards for administrators	18.18	35.00	19.35	2.461	0.292
23. In-service and staff development programs for teachers	2.27	20.00	6.45	6.387	0.041**
24. Opportunities for potential teachers	13.64	40.00	38.71	7.785	0.020**
25. Remuneration and wages	0.00	0.00	0.00	0.00	--
26. Scholarships and bursaries	0.00	0.00	6.45	4.218	0.121
27a. Teachers' involvement in goal-setting	6.82	10.00	9.68	0.275	0.872
b. Teachers' involvement in planning	6.82	15.00	9.68	1.075	0.584
c. Teachers' involvement in operation	6.82	15.00	12.90	1.253	0.534
28. Teachers' involvement in professional organization	0.00	15.00	6.45	6.335	0.042**
29. Teachers' opportunities for continuing education	18.18	50.00	48.39	9.922	0.007**

Table 14--Continued.

30. Number of technically competent:					
a. Administrators	4.55	0.00	6.45	1.277	0.528
b. Supervisors	2.27	0.00	6.45	1.865	0.394
c. Counselors	2.27	0.00	6.45	1.865	0.394
31a. Short-range goals and objectives	52.27	70.00	64.52	2.191	0.334
b. Long-range goals and objectives	0.00	0.00	6.45	4.218	0.121
32. Organization and administration of programs	15.91	10.00	9.68	0.799	0.671
33. Operation of programs	4.55	10.00	9.68	0.959	0.619
34. Funding of programs	0.00	0.00	0.00	0.000	--
35. Quota system of allocating resources (human and materials)	0.00	0.00	3.23	2.086	0.352

Note: X^2=chi-square values; Prob* indicates probability values. ** indicates that this item was significant at the 0.05 level. Degrees of freedom (df) = 2.

the availability of technically competent teachers, as inadequate. For item 23, in-service and staff-development programs for teachers, over 90% of the vocational and technical educators in small and large institutions rated it as inadequate. Twenty percent (20%) of the teachers in medium institutions rated this item as adequate. Approximately 40% of the teachers in medium and large schools rated item 24, opportunities for potential teachers, as adequate, compared to only 14% in small institutions. Similarly, only 18% of the educators in small institutions rated item 29, teachers' opportunities for continuing education, as adequate, compared to about 50% in medium and large institutions.

All (100%) of the educators from small institutions rated item 28, teachers' involvement in professional organization, however, only about 15% of the educators from medium-size institutions and 6.5% of the teachers from large institutions rated this item as adequate. In general, these results show that the availability of competent teachers, in-service and staff-development programs, opportunities for potential teachers, teachers' involvements in professional programs, and continuing education were inadequate in small schools and significantly lower than those found in medium and large institutions.

Perception of Adequacy in Relation to Type of Institution

Tables 15-17 display the percentages and chi-square values of respondents by type of institutions. These institutions were grouped into four categories: (1) colleges of education, (2) others (administrators in the Federal and State Ministry of Education, educators in high schools and industries), (3) technical colleges, and (4) universities. The subjects were 20 educators from the colleges of education, 21 administrators from the Ministry of Education, and educators from secondary or technical high schools and industries (desiginated as "others"), 31 educators from technical colleges, and 23 educators from universities. The perceptions of adequacy of vocational and technical education programs by these educators were analyzed by examining the percentages of the educators' responses to the items under curriculum, content, and staffing and administration by the type of institution.

Table 15 shows the percentage of respondents by type of institution who rated each item under curriculum as adequate. Significant differences (at the 0.05 level of significance) among the four types of institutions were found for goals and objectives clearly defined, nature and scope of programs, and grade placement.

Item 1 on whether goals and objectives were clearly defined was rated as adequate by all or 100% of the educators surveyed in the colleges of education and the

TABLE 15

PERCENTAGE OF RESPONDENTS BY TYPE OF INSTITUTION WHO RATED ITEMS UNDER CURRICULUM AS ADEQUATE

Item	COLL.EDU (N=20)	OTHERS (N=21)	TECH.COL (N=31)	UNIV. (N=23)	X^2	Prob
1. Goals and objectives clearly defined	100.00	80.95	87.10	100.00	7.837	0.050**
2. Nature and scope of programs	80.00	52.38	67.74	100.00	14.430	0.002**
3. Grade placement	60.00	33.33	58.06	82.61	11.034	0.012**
4. Time allotment	60.00	61.90	67.74	91.30	6.710	0.082
5. Responsiveness of curriculum to Nigeria economic and social demands	10.00	9.52	6.45	8.70	0.256	0.968
6. Student counseling and services	10.00	0.00	3.23	8.70	2.868	0.412
7. Textbooks	0.00	0.00	0.00	0.00	0.000	--
8. Laboratory facilities	0.00	0.00	0.00	0.00	0.00	--
9. Laboratory equipment	0.00	0.00	0.00	0.00	0.00	--
10. Industrial practical experience	0.00	0.00	0.00	0.00	0.00	--
11a. Involvement of teachers in curriculum development	5.00	9.52	0.00	8.70	3.033	0.387
b. Involvement of the industries in curriculum development	0.00	9.52	0.00	0.00	7.199	0.066
c. Involvement of curriculum specialist in curriculum development	0.00	4.76	0.00	0.00	3.561	0.313

Note: X^2=chi-square values. ** indicates that this item was significant at the 0.05 level. Degrees of freedom (df) = 3.

universities; however, 12% of the subjects from the technical colleges and 19% of the Federal Ministry of Education, vocational and technical secondary or high schools, and the industries rated this item as inadequate.

All (100%) of university educators and 80% of educators from colleges of education rated nature and scope of programs, item 2, as adequate. Over 32% of the educators from technical colleges and over 45% of "others" from high schools and industries rated these items as inadequate. Item 3, grade placement, was rated as adequate by over 80% of the educators from the universities, and 60% of the educators from colleges of education; over 40% of the educators from the technical colleges and over 65% of the "others" from high schools and industries rated this item as inadequate.

Table 16 shows the percentages of vocational and technical educators by type of institution who rated the items under contents as adequate. No significant differences were found in the opinions and perceptions of the vocational and technical educators by type of institution regarding the adequacy of content in vocational and technical education programs in Nigeria.

TABLE 16

PERCENTAGE OF RESPONDENTS BY TYPE OF INSTITUTION WHO RATED ITEMS UNDER CONTENT AS ADEQUATE

Item	COLL.EDU (N=20)	OTHERS (N=21)	TECH.COL (N=31)	UNIV. (N=23)	X^2	Prob
12. Student knowledge of basic technical information	70.00	57.14	83.87	82.61	5.805	0.121
13. Student knowledge of specialized technical information	0.00	0.00	3.23	0.00	2.086	0.555
14. Graduates' proficiency on the job	10.00	4.76	3.23	0.00	2.763	0.430
15. Supervisory skills of graduates	55.00	38.10	45.16	21.74	5.446	0.142
16. Organizational skills	90.00	76.19	70.97	60.87	4.880	0.181
17. Human relation skills	100.00	90.48	93.55	91.30	1.935	0.586
18. General education skills in English, mathematics, social studies, and health science	100.00	90.48	96.77	100.00	4.185	0.242
19. Periodic evaluation of curriculum	0.00	4.76	0.00	4.35	2.377	0.498
20. Overall rating of vocational and technical education programs	5.00	0.00	3.23	0.00	1.948	0.583

Note: X^2=chi-square values; ** indicates that this item was significant at the 0.05 level. Degrees of freedom (df) = 3.

Table 17 shows the numbers and percentages of educators by type of institution who rated items under staffing and administration as adequate. Significant differences among the four types of institutions were found for Item 32, organization and administration of programs, and Item 33, operation of programs. Item 32, organization and administration of vocational and technical education programs, was rated as inadequate by 100% of the educators in the university. However, 6% of the educators from the technical colleges, 15% of the educators in the colleges of education, and 33% of the educators in the Federal and State Ministry of Education, and the industries where most of the educators were administrators rated this item as adequate.

Operation of vocational and technical education programs, item 33, was rated as inadequate by 100% or all the educators surveyed in the universities, over 95% of educators from colleges of education and technical colleges, but 24% of the other educators from the Federal and State Ministry of Education and the industries rated operation of programs as adequate. It is apparent from these results that educators from "others" who generally were from high schools, industries, and State and Federal Ministry of Education perceived the operation, organization and administration of vocational and technical education programs as more adequate than those from other types of institutions (colleges of education, technical colleges, and universities).

TABLE 17

PERCENTAGE OF RESPONDENTS BY TYPE OF INSTITUTION WHO RATED ITEMS UNDER STAFFING AND ADMINISTRATION AS ADEQUATE

Item	COLL.EDU (N=20)	OTHERS (N=21)	TECH.COL (N=31)	UNIV. (N=23)	X^2	Prob
21a. Availability of technically competent teachers	0.00	9.52	0.00	8.70	4.859	0.182
b. Availability of pedagogically competent teachers	0.00	9.52	0.00	0.00	7.199	0.066
22a. Certification standards for teachers	0.00	0.00	0.00	0.00	0.000	--
b. Certification standards for administrators	30.00	23.81	22.58	13.04	1.860	0.602
23. In-service and staff development programs for teachers	15.00	9.52	6.45	0.00	3.717	0.294
24. Opportunities for potential teachers	25.00	23.81	29.03	30.43	0.342	0.952
25. Remuneration and wages	0.00	0.00	0.00	0.00	0.000	--
26. Scholarships and bursaries	0.00	9.52	0.00	0.00	7.199	0.066
27a. Teachers' involvement in goal-setting	10.00	19.05	3.23	4.35	4.719	0.194
b. Teachers' involvement in planning	10.00	19.05	6.45	4.35	3.286	0.350
c. Teachers' involvement in operation	10.00	23.81	6.45	4.35	5.419	0.144
28. Teachers' involvement in professional organization	10.00	9.52	3.23	0.00	3.220	0.362
29. Teachers' opportunities for continuing education	30.00	38.10	35.48	34.78	0.310	0.958

TABLE 17--Continued.

30. Number of technically competent:						
a. Administrators	10.00	9.52	0.00	0.00	5.506	0.138
b. Supervisors	5.00	9.52	0.00	0.00	4.766	0.190
c. Counselors	5.00	9.52	0.00	0.00	4.766	0.190
31a. Short-range goals and objectives	60.00	52.38	64.52	60.87	0.779	0.855
b. Long-range goals and objectives	0.00	9.52	0.00	0.00	7.199	0.066
32. Organization and administration of programs	15.00	33.33	6.45	0.00	12.655	0.005**
33. Operation of programs	5.00	23.81	3.23	0.00	11.090	0.011**
34. Funding of programs	0.00	0.00	0.00	0.00	0.00	--
35. Quota system of allocating resources (human and materials)	0.00	4.76	0.00	0.00	3.561	0.313

Note: X^2=chi-square values; ** indicates that this item was Significant at the 0.05 level. Degrees of freedom (df) = 3.

Responses of Selected Nigerian Industrial Personnel Interviewed

Six industrial executives were selected and interviewed because of their positions and experience. Moreover, they represented the employers of the output of Nigerian vocational and technical education programs in various disciplines. Each interview lasted about 1 hour. All the executives felt relaxed after learning the truth about my identification as a Nigerian student from the United States and not a reporter for a newspaper. Those executives interviewed were:

1. The Director of Personnel, Nigeria Electric Power Authority, Training Section, Ijora
2. The Training/Workshop Manager, U.A.C. Technical Section, Mechanical and Electrical, Tractor and Equipment, Ebute Metta, Iddo
3. The Contract Director, Seal Construction and Development Company, Kawo-Kaduna
4. The Production Director, Federal Institute of Industrial Research, Oshodi
5. The Chief Maintenance Officer, Federal Ministry of Works and Housing, Lagos
6. The Farm Manager, Owena Farms and Poultry Inc., Otta.

The responses of the selected industrialists interviewed showed that they were aware that there had been

an increase in the number of graduates of Nigerian vocational and technical education programs, but they believed that the system of Nigerian education under colonial rule was better. The system at the time this research was undertaken was described as ill-equipped, lacking competent technical teaching staff, chaotic, having unstable policies with each new military Head of State, lacking materials, and not preparing graduates to fit the job requirements demanded of the new technology. There seemed to be little or no differences in the responses of the industrialists interviewed. The responses were similar, and some executives led me to some broken machines in the workshops that local technicians could not fix in order for me to draw my own conclusions on why hiring foreign graduates or expatriates is preferred to hiring local technical education program graduates. All the industrialists interviewed believed that the graduates of Nigeria's vocational and technical education programs might be theoretically sound but seriously lacking in the practical aspects of the types of jobs available in their manufacturing and production shops.

The six industrialists interviewed believed that vocational and technical education programs in Nigeria were not meeting the manpower requirements and the needs of the industries when they were individually asked in question 1 as to whether the programs were meeting the manpower needs of Nigerian industries. This response corroborated the

expressed opinions of all the educators surveyed on this item. Three of the executives said that the certificates were just a meal ticket for the graduates who were not useful in industry until after they were retrained on the job. Two of the industrialists said the educators were just training the students in employment to beat austerity measures and unemployment. They said the graduates were not competent on first entry into the company, and that the company had to retrain them at company's expense for 2 years or more. Four of the executives said that they travelled every year to recruit overseas in areas where there were no qualified indigenous Nigerians at home despite the cost of hiring abroad.

Four of the industrialists used the word "majority" when describing the number of their workers who were Nigerian graduates, and all the executives interviewed said that they had some foreign graduates and expatriates on their organization's payroll. Two of the executives interviewed said that all their workers were Nigerian graduates except in technical advisement and machine purchases and maintenance. However, to ensure Nigerianization of the positions held by expatriates, those companies were still implementing the 1985 Budgetary Policy of the Head of State, which required the employment of two Nigerian understudies for each expatriate personnel employed below the Board, and within the Board, training Nigerians to be able to assume management positions in joint enterprise.

When the question of how many positions were not filled for lack of personnel, four out of the six industrialists interviewed said that there were no unfilled positions for lack of personnel, but the unfilled positions were still vacant because of lack of raw materials and financial constraints.

When the question of hiring foreign employees was asked, the industrialists regretted the reliance placed on expatriates because of lack of indigenous personnel. Some of the executives interviewed refused to give a direct answer to this question because of the Nigerianization decree. Two who responded to this question said that they relied on the expatriates in their company because of the substantial and persistent manpower shortage of indigenous workers. Moreover, these foreign workers were the only personnel in the company who could fix the machines when the machines were down. If these foreign workers were to be sent from the manufacturers of the machines, the costs would be greater. The expatriates were also the instructors of the indigenous workers for on-the-job training.

The six industrialists interviewed had all hired from two to four foreign graduates or expatriates because of lack of qualified indigenous personnel or lack of such programs in Nigeria. Most of these personnel were in management, training, and consulting for the organization and were highly paid.

Five of the six executives interviewed believed that graduates of Nigerian vocational and technical programs were not equipped with enough skills to perform on the job. The differences between the skills of the graduates of the vocational and technical education programs in Nigeria were compared with the skills of the graduates of technical programs in Nigeria under the colonial rule when vocational and technical education were financed by the International Labor Organization and UNESCO. The system of organization and administration of vocational and technical education at the time of this research was criticized as ill-equipped and lacking competent technical teachers because the foreign technical teachers had left. The programs were said to be lacking in teaching materials and other necessary educational resources, which were formerly supplied free under the auspices of ILO and UNESCO, and the learning atmosphere was described as chaotic because of students' unrest and protests. All these problems were said to have contributed to the reason why the graduates were not well equipped with skills to perform on the job.

All six executives interviewed rated the competencies of Nigerian graduates on specific job assignment as inadequate on first entry into an industry. The lack of competent technical teaching staff, coupled with the lack of materials and resources, and the unstable military government and new educational policies were cited for not allowing the preparation of Nigerian vocational and

technical education graduates to fit into the job requirements demanded of the new technology. Most employers were said to travel overseas for technical advice and training officers for their employees on the job.

Question 7 concerned how long it takes these organizations to train Nigerian graduates on the job. The industrialists interviewed said that vocational and technical education graduates who were in the government services were given 1 year's probation of supervised training on the job, while it might take from 1 to 2 years of retraining in the private organization.

Question 8 addressed why some organizations prefer training employees on the job instead of hiring the graduates of Nigerian vocational and technical programs. Three companies of the interviewed executives had their own training schools: NEPA, Ijora; UAC Mechanical & Electrical, Tractor and Equipment, Air Conditioning and Refrigerator Training Schools, at Iddo and Apapa; and Federal Ministry of Works and Housing Training Workshop, Ijora. Those three executives said they trained their own employees to cut the cost of retraining Nigerian graduates on the job. Companies decided what salary to pay their employees after graduation based on what they could do, unlike a Nigerian vocational and technical education graduate who would demand a higher salary and fringe benefits based on the certificate awarded and the current government salary scales. Company-trained graduates were awarded company diplomas, which were only

useful in the organization to retain the services of their graduates. Company graduates had specialized training in a particular area or on a particular machine.

All the executives interviewed said that their organizations had made no tangible contributions to on-the-job training of learners in Nigeria's vocational and technical education institutions because they had their own trainees on the job. Those executives in government and private companies who had no training schools said that there were no allocations for the allowances and stipends that the participants were demanding while in training. Companies with staffing problems could take advantage of the free National Youth Service Corps of Nigerian graduates; therefore, companies' responses to applicants for on-the-job training or industrial attachment were coldly treated.

In response to question 10 about what changes these executives would suggest for the improvement of Nigeria's vocational and technical program, the industrialists interviewed suggested the following: hiring competent technical teachers, better salary for educators, availability of materials for training, up-to-date machines for new technology, offering new programs, and the involvement and contributions of the industry in curriculum development.

Industrial employers interviewed believed that most of the graduates of Nigeria's vocational and technical education programs, on first entry into a job, were found to

be technically incompetent. The companies had to incur extra expenses to retrain the new graduates, often for a minimum of 2 years in the industry before they could be given full responsibilities. The responses of the vocational and technical educators to the graduates' proficiency on the job, question 14 in section B of the questionnaire, supported the idea that the graduates' proficiency on the job was inadequate, since 89 out of the 95 respondents (93.7% of the population) rated the item as inadequate.

Summary

This chapter presented the findings of the study based on the data obtained from the vocational and technical educators in Nigerian institutions and the result of the tape-recorded interviews with the selected executive personnel in various industries.

Survey questionnaire responses of the vocational and technical educators and the responses of the interviewed industrial executives were used in the analysis of findings of this chapter. An analysis of the data collected from government documents, publications, and commission reports were also used in the analysis. It was determined in the study that:

1. Ninety-two percent of all vocational and technical educators in the population stated that goals and

objectives of vocational and technical education were clearly defined.

2. Seventy-five percent of the educators indicated that the nature and scope of vocational and technical education programs were adequate.

3. Over 90% of the educators stated that vocational and technical education was inadequate in the following areas: textbooks, laboratory facilities and equipment, industrial practical experiences, student counseling and services involving teachers, curriculum specialists and industries in curriculum development; and that the responsiveness of the curriculum to Nigeria's economic and social demands was inadequate.

4. Over 70% of the educators agreed that students had knowledge of basic technical skills, English, mathematics, social studies, and health sciences.

5. Over 90% of the vocational and technical educators stated that the graduates lacked knowledge of specialized technical information and proficiency on the job.

6. Over 95% of the educators stated that the availability of technically and pedagogically competent teachers was inadequate.

7. Over 75% indicated that certification standards for teachers and administrators were inadequate.

8. Over 95% of the educators agreed that remuneration and wages, scholarships, and bursaries were inadequate.

9. Over 85% of the vocational and technical educators in the survey stated that teachers' involvement in goal-setting, planning, operation, and professional organization were inadequate.

10. Over 95% of the educators indicated that the number of technically competent administrators, supervisors, and counselors was inadequate.

11. Over eighty-five percent of the Nigerian vocational and technical educators stated that the operation, organization, and administration of technical education programs in Nigeria were not adequate.

12. All 95 (100%) of the population stated that funding of the technical education programs was inadequate.

13. The quota system of allocating resources (human or material) was rated inadequate by 98.9% of the educators.

14. All the industrialists interviewed believed that the graduates of Nigeria's vocational and technical education programs might be theoretically sound but were seriously lacking in the practical aspects of the types of jobs available in their manufacturing and production shops.

15. All the industrial employers interviewed believed that most of the graduates of Nigeria's vocational and technical education programs, on first entry into a job,

had to be retrained at the company's expense because they were found to be technically incompetent.

16. Ninety-eight percent of the vocational and technical educators in the population agreed that the overall rating of vocational and technical education programs in Nigeria was inadequate.

17. The adequacy of items related to curriculum, content, staffing and administration is not related to whether the educators were lecturers or administrators.

18. More educators from medium and large institutions compared to educators from small institutions perceived nature and scope of programs, grade placement, time allotment, and goals and objectives being clearly defined as adequate. There are significant differences in their perceptions.

19. More educators from smaller institutions rated supervisory skills of graduates as adequate than those educators from medium and large institutions.

20. The majority of the educators from medium and large institutions rated availability of technically competent teachers, in-service and staff-development programs for teachers, opportunities for potential teachers, and teachers' involvement in professional organization as adequate as compared to a lesser percentage of the educators from small institutions.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter 5 presents the summary, conclusions, and recommendations of this study based on the findings from the survey of vocational and technical educators' opinions, the interviews conducted with industrial personnel, and data collected from government publications.

Purpose

The purpose of this study was to examine the status and perceived adequacy of vocational and technical education programs in Nigeria and to identify the major problems associated with the availability of technically and pedagogically competent teachers. Specifically, the following areas with respect to vocational and technical education in Nigeria were examined:

1. The intended objectives of vocational and technical education as prioritized by the Federal Government of Nigeria in the Fourth National Development Plan (1981-1985) and the National Policy on Education (1981 revised edition)

2. The perceived adequacy of vocational and technical education program in Nigeria in meeting the

intended objectives as perceived by selected vocational education administrators and lecturers

3. The differences, if any, in the perception of adequacy between administrators and lecturers of vocational and technical programs

4. The perception of adequacy as related to the size (population) of the institution

5. The perception of adequacy as related to the type of institution.

Procedural Method

This study utilized the survey method to investigate and collect the needed data on the issues of vocational and technical education programs in Nigeria. Two modified types of instruments were formulated for use in the collection of data from the population of vocational and technical educators and the selected industrial personnel.

I visited the following institutions in Nigeria for personal consultation and to determine the status of vocational and technical education programs in Nigeria:

1. Government Technical College, Yaba
2. Lagos College of Science and Technology, Lagos
3. National Technical Teachers College, Akoka
4. Federal Polytechnic, Ado-Ekiti
5. Ibadan Polytechnic, Ibadan
6. Kaduna Polytechnic, Kaduna
7. National Board for Technical Education, Kaduna

8. Ahmadu Bello University, Zaria

9. Federal Polytechnic, Idah

10. University of Nigeria, Nsukka

11. Yaba College of Technology, Yaba

12. Institute of Management and Technology, Enugu

13. Federal Ministry of Education Science and Technology, Ikoyi.

The survey questionnaire for data collection consisted of eight demographic statements in Section A, and 35 brief defining items in Section B, to be rated as adequate or inadequate by the Nigerian vocational and technical educators. The items listed in the questionnaire were subdivided into three subheadings: Curriculum, Contents, and Staffing and Administration. The areas covered by these items were: goals and objectives, nature and scope of programs, grade placement, time allotment, responsiveness of curriculum to Nigeria's economic and social needs, student counseling services, textbooks, laboratory facilities and equipment, curriculum development, overall rating of vocational and technical education programs, funding, and quota system of allocating resources (human and materials).

The structured questions were to elicit the perceptions of purposefully selected industrial personnel on the proficiency of the graduates of vocational education programs in Nigeria, their competencies, hiring practices, training on the job, and number of foreign employees in the

organization. Interview sessions were tape-recorded with permission.

The questionnaires were hand-delivered with cover letters to the provosts, principals, heads, or selected staff of the institutions visited. The first cover letter was to explain the purpose of the study and to guarantee respondents' anonymity and confidentiality of responses and respondents. The second letter from the researcher's committee chairman was addressed to "To Whom It May Concern," requesting cooperation during the data-collection exercise. Purposefully selected staff members in the institutions were chosen to coordinate the collection and forwarding of the completed questionnaire to my address in Lagos before my return to the United States of America for further analysis.

Summary of Findings

The findings of this study are summarized as follows.

Vocational and technical education at the time the research was undertaken was regarded as a dynamic instrument of change. In response to Question 1, the overriding aims and objectives of technical education in Nigeria were to improve the living conditions of the people by increasing the real income of the average citizen and reducing the level of unemployment and under-employment. The aims were (1) to provide trained manpower in applied science,

technology, and commerce; (2) to provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial, and economic development, which would enable young Nigerian men and women to have an intelligent understanding of the increasing complexity of technology; (3) to increase the supply of skilled manpower and the development of technology to foster productivity and greater self-reliance; and (4) to increase participation by citizens in the ownership and management of productive enterprises.

Ninety-two percent of all vocational and technical educators in the population stated that goals and objectives of vocational and technical education were clearly defined.

In response to Question 2--the extent to which the vocational and technical education program in Nigeria is adequate in meeting the intended objectives as perceived by selected administrators and teachers--few items were rated as adequate. Seventy-five percent of the educators indicated that the nature and scope of vocational and technical education programs is adequate, and that students had knowledge of basic technical skills, English, mathematics, social studies, and health sciences. Over 90% of the educators stated that vocational and technical education was inadequate in the following areas: textbooks, laboratory facilities and equipment, industrial practical experiences, student counseling and service involving teachers, curriculum specialists, industries in curriculum

development, and responsiveness of the curriculum to Nigeria's economic and social needs. Over 90% of the vocational and technical educators stated that the graduates lacked knowledge of specialized technical information and proficiency on the job. The overall intended aims and objectives of technical education appeared to be inadequate because of the deficiencies of the above items.

In response to Question 3--to determine if there are differences in the perceptions of adequacy between administrators and lecturers--it was found that there are no differences in the perceptions of the administrators and that of the lecturers in regard to the adequacy or inadequacy of vocational and technical programs.

In response to Question 4--to examine if the perceptions of adequacy are related to size (population) of institution--it was found that there are few significant differences in the perceptions of adequacy as related to size. The adequacy of some items under curriculum, content, staffing, and administration are related to size. Educators from small institutions rated some items as inadequate, whereas educators from medium and large institutions rated the same items as adequate. It was found that the availability of competent teachers, in-service and staff-development programs, opportunities for potential teachers, teachers' involvements in professional programs, and continuing education were inadequate in small schools and

significantly lower than those found in medium and large institutions.

In response to Question 5--to examine if the perceptions of adequacy are related to type of institution--it was found that there are few significant differences on a number of items on the perceptions of adequacy as related to type of institution. Significant differences were found among the four types of institutions for goals and objectives clearly defined, nature and scope of programs, grade placement, and time allotment. Also, there are significant differences among the four types of institutions on organization and administration of programs, and operation of programs. It was found that educators from "others" who generally were from high schools, industries, and State and Federal Ministry of Education perceived the operation, organization, and administration of vocational and technical education programs as more adequate than those from other types of institutions (colleges of education, technical colleges, and universities).

Conclusions

The literature reviewed, survey opinions analyzed, and the procedures used provided the data, findings, and conclusions drawn in this study. The following conclusions were made based on: the literature, interviews, and survey.

Literature

1. The aims and objectives of vocational and technical education programs in Nigeria were clearly defined.

2. There has been an increase in the number of schools and institutions; student enrollment was at its highest but this led to an increase in the number of unemployed or under-employed graduates of Nigeria's vocational and technical education programs.

Interviews

1. From the perceptions of the industrialists, graduates of Nigeria's vocational and technical education programs did not have the competencies necessary to perform in the industries.

2. The interviewed executives were not a source of funds for financing vocational and technical education in terms of capital investment, program operation, or equipment supply. Rather, they had their own on-the-job training schools for the employees in their organization.

Survey

1. The National Board for Technical Education established by the Federal Military Government of Nigeria on January 11, 1977, inadequately performed all the functions of directing the operations, development, and administration

of all aspects of vocational and technical education programs in Nigeria.

2. The production and supply of qualified and competent vocational and technical education teachers at most levels of the educational system were insufficient. Provisions to improve and increase the quantity and quality of teachers were inadequately made, hence the reality was not in keeping with what the newly created states were hoping for.

3. The status of vocational and technical education programs in Nigeria was such that the programs were not entirely responsive to the economic and social needs of the country.

4. There was improper use of funds to finance vocational and technical education programs. This problem undoubtedly was the most serious constraint to its development in the face of the educational expansion that had taken place since the beginning of the National Development Plan.

5. The needs of industry, the students, the local concerned community, and teachers were not utilized in curriculum development for the program of study. Future employers, curriculum specialists, and vocational and guidance counseling specialists who should have been among the foremost were not involved on the list of vocational and technical education curriculum planners.

This study could conclude that inspite of the well-formed aims and objectives of vocational and technical education programs in Nigeria, the Fourth National Plan for Development 1981-1985 did not meet expectations as perceived by those interviewed in terms of the methodologies adopted and the highly disaggregated and detailed forecast it provided for vocational and technical education programs. The actual growth rate of the Nigerian economy fell short of its target due to the unforeseen fall of world oil market prices. People have blamed the rapid expansion of the whole educational system on the oil boom and the unforeseen fall of world oil market prices. The excessive demand for education led to the indiscriminate establishment of institutions in the new states, which led to the inefficient utilization of available financial resources and wasteful duplication of programs and expensive facilities. The required competent vocational and technical education teachers and administrators were in short supply, in addition there was a shortage of physical facilities, equipment, and necessary teaching aids. The predicted manpower requirements turned out to be short of the projections of overall industrial, economic, and social needs, and these accounted for the unattainable economic stabilization and the unrealistic occupational choices by potential labor-market entrants or graduates of Nigerian vocational and technical education programs who were mismatched for open unemployment.

Recommendations

It was apparent from the conclusions drawn from this study that the vocational and technical education program in Nigeria was inadequate. The planning process of any vocational and technical education program is very important and complex, and involves processes that must be conducted annually. Effective planning entails the development and use of continual sources of student data, labor-market data, and evaluation data, based on which program planning decisions are to be made. The problem facing Nigeria's vocational and technical education was the lack of a basic guiding policy. The crux of the problem in terms of policy was which specific policy objectives should be set so as to improve the situation, and how to set these objectives. The most important step is to set realistic objectives and then implement them. This implementation in the first instance involves creating the necessary structures for planning and managing vocational and technical education programs with feedback into the policy-making process. Structures nicely designed on paper cannot do the job. Something has to be done to ensure that they function.

Based on the results of the findings and the conclusions arrived at from this study, the following recommendations are suggested:

1. The vocational education planning process can be outlined in many different ways. Any comprehensive planning

process, however, may be described basically as a problem-solving activity. In Nigeria's vocational and technical education programs, comprehensive planning should involve the use of a logical and systematic procedure to answer planning questions such as the following:

a. What are the needs of the student and labor market in Nigeria or the local community?

b. What programs and services should Nigeria's technical colleges or institutions provide to meet these needs?

c. Who will teach the learners the needs of the labor market?

d. How will the administrator monitor the process and know whether the set goals have been achieved?

e. Are the financial and material resources available?

The result of a well-conducted comprehensive planning process should be the design, implementation, and evaluation of vocational and technical education programs that meet the identified needs and goals. Nigeria's vocational education planners must ensure that the actual output from education and training institutions is consistent with the needs of the economy.

2. The National Board for Technical Education should be decentralized; this autonomous body should be integrated into the organizational structure of the Federal

Ministry of Education Science and Technology Section. The authority and functions of this body are considerably large.

The National Board for Technical Education's lines of direct connection to education and training units should be through the local and state inspectorates to the headquarters, which are responsible for executing the programs and norms adopted in the institutions and state units coming within the N.B.T.E. jurisdiction.

This type of decentralization and state branch offices will make it easier for the National Headquarters of N.B.T.E. to run an effective operation of planning, coordinating, implementing, and evaluating vocational and technical education programs.

3. Curriculum planning and development are the core of any vocational and technical program. There is the need to ensure that curriculum, equipment, and instruction are state of the art. The problem facing the curriculum of Nigeria's vocational and technical education programs is the difficulty in discontinuing the old textbook-based teaching methods and theoretical examinations as a measure of competency. Curriculum development should be based on the manpower needs of the Nigerian industrial market. This is why it should be more practical, basic, and specialized technical information. The needs of the community where such programs are needed should also be considered. The grouping of technical contents of programs should depend on the analysis of what the worker does and what he or she

needs to know. Because of the wide variations in curricula of technical institutions, it is not feasible to suggest typical curricula in technical education programs. The needs of specific occupations as determined by the occupation analysis should determine the content of the curriculum, such as basic technical information, specialized technical information, basic technical skills, specialized technical skills, technical judgment, and supervisory skills.

4. Vocational programs that are not attracting a good number of students for enrollment, that do not meet the needs of the industrial establishment, and those that are too expensive to run should be phased out. With job market requirements in constant flux and institutional budgets getting tighter each year, Nigeria's vocational and technical institutions cannot escape the need to prune programs that are not attracting the students, that are not meeting local and industrial needs, and are overly expensive. Four problems should typically suggest phasing out a program: insufficient enrollment, no direct impact on the mission of the country, insufficient funding, and unsatisfactory job placement of Nigerian vocational and technical program graduates. It is a critical decision to make, but all possible alternatives must first be explored. If after the educators have done a careful analysis of the situation to be certain that there really is a problem, then they must ensure that the evidence is there for all fair-

minded people to see. They must ascertain what unsatisfactory results will follow from failure to address the problem, and then frame the problem as objectively as possible. Several options might be explored before finally phasing out any programs such as:

a. Finding alternative funding for programs

b. Incorporating portions of the program into another related program

c. Developing a cooperative agreement with another institution to meet students' needs jointly and to avoid duplications

d. Redesigning curricula offerings to make them attractive to students

e. Revising program delivery to reduce its costs (less frequent course offerings, or increases in class size).

When these and other alternatives fail to correct the problem, the responsible administrator then focuses attention on phase-out.

5. A well-equipped vocational and technical education program needs a prototype or less expensive equipment that can be used to train the learners about the principles of operation of the machines used in the industry. Facilities and equipment for vocational and technical education require the type selected after the courses are planned and the needs for equipment are known.

Less expensive equipment may be used in Nigerian school shops if the principles of operation of the machines are the same as those used in industry. The use and involvement of local industries will be a relieving factor for schools that cannot provide all of the facilities and equipment needed for training programs by cooperative programs involving on-the-job training.

6. The Federal Government of Nigeria should devise a means of contacting its citizens with various specialized technological skills who are still residing abroad to be given enough incentives to attract them as educators to the various vocational and technical institutions in Nigeria. Foreign nationals with proven technological expertise should be encouraged to seek employment in Nigeria so as to meet the manpower needs of the country.

7. Technical- and vocational-education degree programs should be developed in all Nigerian universities and colleges where the pedagogy and methodology of teaching should be imparted through graduate teaching and research assistantships to improve the inadequate preparation of technical teachers by training and/or experience and to help increase the supply of technical teachers.

8. Teachers' remuneration and benefits should be increased to a higher grade level, giving technical teachers a comparable income with their counterparts in the industries, government, and private sectors.

9. The Federal Government of Nigeria should assume greater responsibility for the acquisition of vocational and technical education equipment, facilities, and for the provision of staff-development programs, in-service training for vocational personnel, and for all institutions to have a vocational and guidance-counseling specialist to assist learners in making career choices in their program selections.

10. Vocational and technical education programs are for those involved: teachers, learners, industrialists, curriculum specialists, vocational and guidance-counseling specialists, and the community. Therefore, the Federal Government of Nigeria should work in conjuction with the local entities, states, missions, industries, and commerce to fund programs. Plans must be set forth in detail regarding the policies and procedures to be followed in the distribution of funds to state and local educational agencies and for the use of such funds.

11. The National and State plans must include provisions regarding:

a. evaluations of local and state programs in light of needs and job opportunities

b. minimum qualifications for teachers, supervisors, and administrators

c. cooperative arrangements with the system of public employment offices of the state and other

agencies, organizations, and institutions concerned with labor-force needs and job opportunities.

12. There is a need to adopt Competency-Based Vocational Education programs in Nigeria to give a qualitative result rather than quantitative graduates. If adopted, competency-based vocational education might upgrade the quality and performance of the students and that of the teachers if policies are formulated and implemented to meet the needs of students, teachers, and industry. Nigeria's technical education curriculum should shift from the quantitative (almost entirely theoretical) to qualitative practical (what a graduate can do with what he knows in the shop, laboratory, or in the field). The curriculum contents should be made responsive to the economic, industrial, and social needs of Nigeria. Graduates of Nigeria's vocational and technical education programs should be technically competent for the needs of the employers.

A qualitative evaluation is of critical importance by the administration to examine the quality of technical education received by the graduates who constitute the focus of investment in technical education. If these graduates are meeting the demands of the social and industrial needs of the country after the completion of their programs, then the aims and the objectives of technical education must have been achieved. It was this condition that constituted the focus of this paper and the recommendations suggested to

ensure the adequacy of vocational and technical education program in Nigeria.

Recommendations for Further Research Study

The cooperation, completion, and timely return of the questionnaires by the Nigerian vocational and technical educators and the responses of the selected industrial personnel in this study have demonstrated the interests and reliance on scholarly research studies that can improve the adequacy of vocational and technical education programs for the economic growth and development of Nigeria. This being so, the following areas are recommended for further research studies:

1. A study should be conducted to compile and list the degree of competency that a learner should have attained in a particular program area (as suggested by employers, curriculum specialists, technical teachers, and occupational analysists) in order to be awarded the Higher National Certificate or Ordinary National Certificate or the following ratings for each task of employability in a given vocational or technical profession:

3 = Skilled: can work independently without supervision

2 = Moderately Skilled: can perform job completely with limited supervision

1 = Limited Skill: requires instruction and close supervision

N = No Exposure: no experience or knowledge in this area.

2. A study should be undertaken on the identification and verification of competencies important to vocational and technical education programs and industrial needs in Nigeria to expose Nigerian graduates to the current technology in developed countries.

3. This study could be replicated at the end of every National Development Plan period for input evaluation, process evaluation, and product evaluation for accountability and achievement of set objectives, to include gathering of data from the employers, the employed, and unemployed graduates of the vocational and technical education programs in the work force.

APPENDIX A

LETTERS

CHAIRMAN'S INTRODUCTION LETTER

ANDREWS UNIVERSITY

April 14, 1993

To whom it may concern:

James Owolabi, a doctoral student of mine is attempting to examine the adequacy of vocational and technical education in Nigeria. This study will be of value to the private sector and government agencies.

James is proceeding to Nigeria to collect the data for his dissertation. Any help that can be given to him would be greatly appreciated. It will be necessary for James to return to Andrews University in Michigan for the analysis of the data and to defend his dissertation.

Thank you for your help.

Sincerely,

Edward A. Streeter
Chairman and Professor of Educational Administration
and Supervision

INVESTIGATOR'S INTRODUCTION LETTER

ANDREWS
UNIVERSITY

JAMES BAMIDELE OWOLABI
9766 Rosehill Road #44
Berrien Springs, MI 49103

April 16,1993

The Director
Federal Ministry of Education Science & Technology
Vocational and Technical Education Section
Victoria Island
Lagos

Dear Sir,

My name is James Owolabi, a graduate student at Andrews University. I am currently engaged in my doctoral research under the direction of Dr.Edward Streeter, Chairman of the Educational Administration and Supervision Department.

The purpose of this research is to examine the adequacy of vocational and technical education programs and the administrative problems of staffing the programs.

I am hereby requesting your permission to include your staff in the subjects of the population who will complete the questionnaire for this study. Since my study design will both be documentary and descriptive in nature,I am aiming at surveying random selected vocational and technical educators at all levels in Nigeria.

Enclosed herewith is your copy of the questionnaire to be completed. I will kindly need your help and assistance while distributing the other copies to your staff. Also completed copies can be dropped in your office for my collection before May 30, 1993. I hope to return to the United States for the final analysis of this study first week of June 1993.

Thank you for your kind assistance.

Sincerely Yours

James B.Owolabi

APPENDIX B

QUESTIONNAIRES

VOCATIONAL AND TECHNICAL EDUCATOR OPINION QUESTIONNAIRE ON THE PERCEIVED ADEQUACY OF NIGERIA VOCATIONAL AND TECHNICAL EDUCATION PROGRAMS

The Perceived Adequacy of the Vocational and Technical Education in Nigeria and The Administrative Problems in Staffing the Programs.

Andrews University
School of Education
Department of Administration & Supervision
Berrien Springs, MI 49104-0100

Researcher: Owolabi, James Dele

Section A
Demography

Please place an "X" in the appropriate bracket for each of the following statements:

1. Present position in the Institution or Ministry of Education:
   ( ) Administrator/Provost/Principal/Head of Department
   ( ) Lecturer/Education Officer/Instructor

2. Present qualification:
   ( ) M.S.; M.A.; M.Ed.; Ed.D./Ph.D.
   ( ) B.S.; B.A.; B.Ed.; H.N.D.
   ( ) City and Guild F.T.C, T.T.C.
   ( ) O.N.D., N.C.E., W.A.S.C./G.C.E.

3. Type of Institution you are working for:
   ( ) Federal/State Ministry of Education
   ( ) University
   ( ) Polytechnic/College of Technology
   ( ) College of Education (Technical)
   ( ) Secondary School (Technical)
   ( ) Industrial/Commercial Company

4. Student Enrollment in your Institution?
   ( ) Under 1000
   ( ) 1000 - 2000
   ( ) 2000 - 3000
   ( ) Over 3000

5. Highest certificate obtainable at your Institution:
   ( ) Degree Awarding
   ( ) H.N.D., O.N.D.
   ( ) N.C.E. (Tech, T.T.C. (Diploma)
   ( ) City and Guild Certificates

6. Departmental Affiliation:
   ( ) College of Technology/School of Engineering
   ( ) Industrial Arts and Vocational Education
   ( ) Vocational Programs only
   ( ) Vocational and Liberal Education

7. Number of Years you have worked:
   ( ) less than 1 year
   ( ) 1-4 years
   ( ) 4-8 years
   ( ) over 8 years

8. Are you a beneficiary of the T.T.T.P. under the auspices of the U.S.A.I.D. started in 1982
   ( ) Yes
   ( ) No

Section B

DIRECTION FOR RATING

Please read each item carefully and decide which items are adequate for vocational and technical education programs in Nigeria. Respond to each item according to the following scale criteria:

4 -- indicates that this item is Very Adequate
3 -- indicates that this item is Adequate
2 -- indicates that this item is Inadequate
1 -- indicates that this item Cannot Be Determined

Circle the appropriate number in your opinion

CURRICULUM

1.	Goals and objectives clearly defined	1	2	3	4
2.	Nature and scope of programs	1	2	3	4
3.	Grade placement	1	2	3	4
4.	Time allotment	1	2	3	4

5.	Responsiveness of curriculum to Nigeria economic and social demands	1	2	3	4
6.	Student counseling and services	1	2	3	4
7.	Textbooks	1	2	3	4
8.	Laboratory facilities	1	2	3	4
9.	Laboratory equipment	1	2	3	4
10.	Industrial practical experience	1	2	3	4
11a.	Involvement of teachers in curriculum development	1	2	3	4
b.	Involvement of the industries in curriculum development	1	2	3	4
c.	Involvement of curriculum specialist in curriculum development	1	2	3	4

CONTENTS

12.	Student knowledge of basic technical information	1	2	3	4
13.	Student knowledge of specialized technical information	1	2	3	4
14.	Graduates proficiency on the job	1	2	3	4
15.	Supervisory skills of graduates	1	2	3	4
16.	Organizational skills	1	2	3	4
17.	Human relation skills	1	2	3	4
18.	General education skills in English, mathematics, social studies, and health science	1	2	3	4
19.	Periodic evaluation of curriculum	1	2	3	4
20.	Overall rating of vocational and technical education programs	1	2	3	4

STAFFING AND ADMINISTRATION

21a.	Availability of technically competent teachers	1	2	3	4
b.	Availability of pedagogically competent teachers	1	2	3	4
22a.	Certification standards for teachers	1	2	3	4
b.	Certification standards for administrators	1	2	3	4
23.	In-service and staff development programs for teachers	1	2	3	4
24.	Opportunities for potential teachers	1	2	3	4
25.	Remuneration and wages	1	2	3	4
26.	Scholarships and bursaries	1	2	3	4
27a.	Teachers' involvement in goal-setting	1	2	3	4
b.	Teachers' involvement in planning	1	2	3	4
c.	Teachers' involvement in operation	1	2	3	4
28.	Teachers' involvement in professional organization	1	2	3	4
29.	Teachers' opportunities for continuing education	1	2	3	4
30.	Number of technically competent:				
a.	Administrators	1	2	3	4
b.	Supervisors	1	2	3	4
c.	Counselors	1	2	3	4
31a.	Short-range goals and objectives	1	2	3	4
b.	Long-range goals and objectives	1	2	3	4
32.	Organization and administration of programs	1	2	3	4
33.	Operation of programs	1	2	3	4
34.	Funding of programs	1	2	3	4
35.	Quota system of allocating resources (human and materials)	1	2	3	4

SAMPLE INTERVIEW QUESTIONS FOR INDUSTRIAL PERSONNEL

Type of Business or Industry.....

Status of Interviewee.....

1. Are vocational and technical education programs meeting the manpower needs of Nigeria industries?

2.How many of your employees are graduates of Nigeria vocational and technical education programs?

3. How many positions are not filled in your companies for lack of personnel?

4. How many foreign employees are hired by your company because of lack of indigenous personnel or lack of such program in Nigeria vocational institution?

5. Are the graduates of Nigeria vocational and technical education programs equipped with enough skills to perform on the job?

6. How does your company rate the competencies of these graduates on specific job assignments?

7. How long does your organization train these graduates on the job?

8. Why does your organization prefer training her employees on the job instead of hiring the graduates of Nigeria vocational and technical programs?

9. What are your company's contributions to on-the-job training of learners in Nigeria vocational and technical institutions?

10. What changes will you suggest for the improvement of Nigeria vocational and technical programs?

APPENDIX C

NATIONAL UNEMPLOYMENT RATES

NATIONAL UNEMPLOYMENT RATES, NIGERIA: DECEMBER 1985-DECEMBER 1992

Survey Period	Composite	Urban	Rural
Dec. 1985	6.1	9.8	5.2
March 1986	6.3	9.1	5.6
June 1986	6.1	11.0	4.9
Sept. 1986	5.3	10.0	4.1
Dec. 1986	5.3	9.1	4.6
March 1987	4.5	8.7	3.5
June 1987	6.0	8.6	4.9
Sept 1987	7.4	12.2	6.2
Dec. 1987	7.0	9.8	6.1
March 1988	5.1	7.3	4.6
June 1988	4.5	7.2	3.9
Sept. 1988	4.1	10.0	3.8
Dec. 1988	5.3	7.8	4.8
March 1989	4.4	8.7	3.5
June 1989	4.1	9.2	3.0
Sept. 1989	4.5	8.1	3.7
Dec. 1989	4.0	7.5	3.2
March 1990	3.7	6.9	3.0
June 1990	3.1	5.3	2.6
Sept. 1990	3.2	4.8	2.8
Dec. 1990	3.5	5.9	3.0
March 1991	4.1	5.9	3.6
June 1991	4.2	5.5	3.9
Sept 1991	2.9	4.4	2.6
Dec. 1991	3.1	4.9	2.7
March 1992	3.4	4.7	3.1
June 1992	3.2	4.2	3.0
Sept. 1992	4.9	5.8	2.6
Dec. 1992	3.4	4.6	3.2

UNEMPLOYED BY EDUCATIONAL LEVEL, BY AGE GROUP AND BY SEX, NIGERIA, DEC. 1992

	Composite		Urban		Rural	
	Sept. 1992	Dec. 1992	Sept. 1992	Dec. 1992	Sept. 1992	Dec. 1992
Educational Level						
All levels	100.0	100.0	100.0	100.0	100.0	100.0
No Schooling	15.1	19.0	18.8	19.1	14.3	19.0
Primary	19.9	15.7	14.5	10.4	21.0	16.9
Secondary	62.3	59.2	60.0	65.6	62.8	57.8
Higher than Sec.	2.7	6.1	6.7	4.9	1.9	6.3
Age Group						
All Groups (i.e. 15-59)	100.0	100.0	100.0	100.0	100.0	100.0
15-24	69.1	64.4	71.5	70.5	68.6	65.5
25-44	21.1	28.2	21.8	23.5	20.9	23.2
45-59	9.8	10.4	6.7	6.0	10.5	11.3
Sex						
Both Sexes	100.0	100.0	100.0	100.0	100.0	100.0
Male	50.7	58.6	51.5	49.2	50.5	50.6
Female	49.3	41.4	48.5	50.8	49.5	39.4

Source: Statistical News: Reprinted by permission Federal Office of Statistics, Lagos.

APPENDIX D

TABLES

NUMBER OF TEACHER TRAINING INSTITUTIONS BY STATES 1981/82-1985/86

STATE	1981/82	1982/83	1983/84	1984/85	1985/86
Anambra	19	21	21+	21	21
Bauchi	22	22	22	22	11
Bendel	12	21+	21+	21	10
Benue	18	n.a	n.a	18	18
Borno	23	n.a	n.a	n.a	17
Cross River	13	13	13	12	5
Gongola	13	14+	14	14	14
Imo	14	14	14	14	14
Kaduna	22	22	22	22*	24
Kano	23	23	22	13	22
Kwara	13	13	13	13	13
Lagos	8	8	8	8	4
Niger	16	18	18	18	9
Ogun	8	8	8	8	8
Ondo	11	11	11	11	2
Oyo	19	18	18+	18	15
Plateau	16	16	16	16	16
Rivers	19	19+	19+	6	5
Sokoto	27	27	n.a	20	20
F.C.T. (Abuja)	2	2	2	2	1
Total	318	290	263	277	249

Note: n.a.=Not available; Source: Federal Ministry of Education, Science and Technology. Reprinted by permission FMEST from National Rolling Plan 1992-1994.

NUMBER OF STUDENTS IN TEACHER TRAINING INSTITUTIONS BY STATES 1981/82-1985/86

State	1981/82	1982/83	1983/84	1984/85	1985/86
Anambra	15,131	15,273	15,408	17,729	18,539
Bauchi	14,511	19,241	10,814	18,139	12,806
Bendel	27,868+	33,022	35,113	14,549	12,481
Benue	12,734	n.a	n.a	16,594	10,598
Borno	23,668	n.a	n.a	29,207	20,660
Cross River	10,017	8,575	8,285	7,224	1,849
Gongola	14,882	7,063	17,626	16,760	16,518
Imo	10,249	9,993	7,714	4,961	2,214
Kaduna	25,035	28,849	36,958	36,958	35,142
Kano	20,625	23,353	21,875	21,474	21,982
Kwara	13,677	15,177	16,480	13,651	10,466
Lagos	3,659	3,098	n.a	4,907	2,696
Niger	13,657	10,861	8,851	6,804	5,981
Ogun	8,199	7,800	7,268	5,221	3,556
Ondo	9,703	9,631	9,458	7,349	1,093
Oyo	10,992	12,209	14,719	12,136	12,743
Plateau	17,718	19,503	21,314	20,238	18,681
Rivers	7,735	9,191	3,672	2,399	635
Sokoto	29,159	26,343	28,435	17,223	13,506
F. C. T. (Abuja)	210	855	1,345	1,715	1,185
Total	292,429	260,037	265,335	275,238	223,331

Note: n.a.=Not available; Source: Federal Ministry of Education, Science and Technology. Reprinted by permission FMEST from National Rolling Plan 1992-1994.

APPENDIX E

CURRICULUM

NATIONAL BOARD FOR TECHNICAL EDUCATION

HIGHER NATIONAL DIPLOMA (HND)

IN

MECHANICAL ENGINEERING TECHNOLOGY

OPTIONS IN:

AUTOMOTIVE ENGINEERING TECHNOLOGY,
BUILDING SERVICES AND REFRIGERATION ENGINEERING TECHNOLOGY,
MACHINE BUILDING ENGINEERING TECHNOLOGY,
PRODUCTION ENGINEERING TECHNOLOGY,
POWER/PLANT ENGINEERING TECHNOLOGY.

CURRICULUM AND COURSE SPECIFICATIONS

1990

Plot 8. Bida Road, P. M. B. 2239, Kaduna
NIGERIA.

GENERAL INFORMATION:

1.0 PHILOSOPHY OF THE MECHANICAL ENGINEERING PROGRAMME

The Mechanical Engineering programme is designed to reflect a FUNCTIONAL philosophy of education. While seeking to achieve academic excellence and promote the furtherance of knowledge, the mechanical engineering programme also seeks to aid the acquisition of appropriate skills, abilities and competence both mental and physical as equipment for the individual to live in and contribute to the development of his/her society.

The programme is therefore committed to the production of qualified and competent technologists who will be able to face the challenges concomitant with the aspiration of the country to be technologically developed.

2.0 GOAL AND OBJECTIVES OF THE PROGRAMME OPTION

2.1 AUTOMOTIVE ENGINEERING TECHNOLOGY OPTION

This option of the Mechanical Engineering Technology Programme is aimed at producing technologists who understand the design and construction of the various automotive engines and can perform supervisory and management functions in the automotive manufacturing, maintenance and repair industries.

Specifically, diplomates of the programme should be able to:

i. interprete design diagrams and instruction manuals of automotive and heavy duty equipment;

ii. know the basic principles underlying the design of an automotive and heavy duty equipment and their application;

iii. construct suitable jigs as may be necessary for the production and assembly of the various components of an automotive;

iv. diagnose any fault in both the engine and other physical structure of an automobile and rectify them;

v. analyse and test the performance of an automotive, using relevant equipment

vi. manage an automotive assembly plants, sales and service workshops/garage and

vii appreciate pollution control, and general safety in the automotive industry

Building services and Refrigeration Engineering Technology option

This option is designed to produce mechanical engineering technologists in building services and refrigeration who can work with professional engineers in consultancy service, technical sales and supply establishments, automotive, textile, breweries, hotels and public organisation. Diplomates of this option, should be able to:

i. install and maintain airconditioning systems and equipment;

ii. carry out system design, fabrication and installation of ductings and pipework for distribution of air, water and refrigerants;

iii. design, install and maintain mechanical services to building, e.g. water supply, lifts, sewages treatment and waste disposal systems, kitchen and laundry equipment;

iv. diagnose and carry out repairs to faulty refrigeration and building services equipment;

v prepare bills of quantities and estimates for new, repair and maintenance work for building services and refrigeration system.

Power and Plant Engineering Technology option

The programme is designed to produce a power and plant technologist for the manufacturing, transportation and power generating industries such as NEPA, NPA, NRC, REB. Diplomates of the programme should be able to.

i. interpret information in mechanical and technical literature and specify requirements for mechanical systems;

ii. install, maintain and repair industrial plants;

iii. install, maintain, diagnose and repair power generating units such as internal combustion engines, gas and steam turbines, hydraulic and pneumatic equipment, e.g. forklift, compressors and steam boilers

iv. supervise mechanical engineering technicians, craftsmen and artisans in a manufacturing and other process and industrial plants;

v. plan and execute maintenance operations in industrial and power generating plants.

Machine Building Engineering Technology options

The programme is designed to produce a technologist in machine building and tool making industries. Diplomates of the programme should be able to:

i. take active part in the design planning and operation of a machine tool production process;

ii. design jigs and tools and produce proto-types of the items;

iii. diagnose problems associated with engineering machines and equipment as well as supervise their assembling installation and maintenance;

iv. set up small-scale machine production/assembly and maintenance companies

v. undertake direct and supportive roles in academic, research and teaching.

Production Engineering Technology

The programme in production engineering technology is aimed at producing technologists with knowledge and skills for production and maintenance of the mechanical engineering and milar industries. Diplomates of the programme should be able to:

a. use and operate various machine tools and equipment in the production of engineering components.

b. understand the principles and application of production management techniques;

c. design tools and jigs and produce proto type of such items;

d. fabricate metal products using various techniques and processes;

e. plan and carry out installation, maintenance and repair of plant, machines and equipment;

f. manage materials and human resources in the production industries at this level

3.0 ENTRY REQUIREMENTS

The general entry requirements for the HND programme include:

a. all the requirements for admission into the ND programme in mechanical Engineering Technology;

b. a minimum of lower credit pass (CGPA) of 2.50 and above in the ND examination in Mechnical Engineering Technology; and

c. a minimum of one year cognate work experience.

In exceptional cases, the ND diploma e with a pass grade (CGPA) 2.0 - 2.49) in the ND examination that had two or more years of cognate work experience may be considered for admission into the HND programme. However, the number of candidates should not be more than 10% of the total student intake in each class.

4.0 DURATION

4.1 The programme is designed to run for four semesters, that is two academic sessions

5.0 CURRICULUM

5.1 The curriculum of HND programme consists of four main components; These are:

a. General Studies/Education

b. Foundation Courses

c. Professional Courses

d. Project

5.2 The General Education component shall include courses in:
English Language, Communication, Industrial Management and Engineer in Society
The General Education component shall account for not more than 15% of the total contact hours for the programme.

5.3 Foundation Courses include courses in Mathematics.
The number of hours for the programme may account for about 10-15% of the total contact hours.

5.4 **PROFESSIONAL COURSES** are courses which give the student the theory and practical skills needed to practice in the field at the technologist level. These account for between 60-70% of the contact hours.

6.0 **PROJECT WORK** shall be evaluated at the end of the fourth semester of the second year or for each of the courses.

7.0 **CURRICULUM STRUCTURE**

The structure of the Higher National Diploma programme consists of four semesters of classroom, laboratory and workshop activities in the college.
Each semester shall be of 18 weeks duration made up as follows:

i. 15 weeks of teaching, i.e. recitation, practical exercises, quizzes, test, etc: and

ii. 3 weeks for examinations and registration.

8.0 ACCREDITATION

The Higher National Diploma Programme shall be accredited by the National Board for Technical Education before the diplomates can be awarded the diploma.

Details about the process of accreditting a programme for the award of Higher National Diploma are available from the Executive Secretary, National Board for Technical Education, Plot 8, Bida Road, Private Mail Bag, 2239, Kaduna Nigeria.

9.0 AWARD OF HIGHER NATIONAL DIPLOMA

The award of the Higher National Diploma should be based on the following:

i satisfactory performance in all prescribed course work which may include class-work, tests, quizzes, workshop practice and laboratory work.

ii satisfactory performance at all semester examinations;

iii satisfactory completion of final year project work.
Normally, continuous assessment contributes 30%, project work 10% while semester examinations are weighted 60% to make a total of 100%.

Higher National Diploma should be awarded in four classes:

i. Distinction — GPA of 3.50 and above

ii. Upper Credit — GPA of 3.00 — 3.49

iii. Lower Credit — GPA of 2.50 — 2.99

iv Pass — GPA of 2.00 — 2.49

10.0 GUIDANCE NOTES FOR TEACHERS

10.1 The new curriculum is drawn in unit courses. This is in keeping with the provisions of the National Policy on Education which stresses the need to introduce the semester credit units which will enable a student who so wished to transfer the units already completed in an institution of similar level from which he/she is transferring.

10.2 In designing the units, the principle of the modular system by product has been adopted, thus each of the professional modules, when completed provides the student with technician operative skills, which can be used for employment purposes.

10.3 As the success of the credit unit system depends on the articulation of programmes between the institutions and industry, the curriculum content has been written in behavioural objectives, so that it is clear to all the expected performance of the student, who successfully completed some of the courses or the diplomates of the programme. There is a slight departure in the presentation of the performance — based curriculum which requires to be stated the conditions under which the performace are expected to be carried out and the criteria for the acceptable levels of performance. It is a deliberate attempt to further involve the staff of the department teaching the programme to write their own curriculum stating the conditions existing in their institution under which the performance can take place and to follow that with the criteria for determining an acceptable level of performance. Departmental submission on the final curriculum may be vetted by the Academic Board of the institution.

Our aim is to continue to see to it that a solid internal evaluation system exists in each institution for ensuring minimum standard and quality of education in the programmes offered throughout the polytechnic system.

10.4 The teaching of the theory and practical work should, as much as possible, be integrated. Practical exercises, especially those in professional courses and laboratory work should not be taught in isolation of the theory. For each course, there should be a balance of theory to practical in the ratio of 50 : 50 or 60 : 40 or the reverse.

11.0 FINAL YEAR PROJECT

Final year students in this programme are expected to carry out a project work. This should be on individual basis. The project should as much as possible, be a marketable product. Project reports should be well presented and should be properly supervised.
The department should make their own arrangement of schedules for project work.

NATIONAL BOARD FOR TECHNICAL EDUCATION.
PLOT B. BIDA ROAD.
KADUNA.
NIGERIA.

MAY 1990

AUTOMOTIVE ENGINEERING TECHNOLOGY OPTION

SEMESTER ONE

15 weeks/semester
Hours/week.

S/No	Code	Title	L	T	P	CU
1.	GNS 301	Use of English III	2	—	—	2
2.	MTM 311	Advanced Algebra	2	—	—	2
3.	GNS 311	Engineer in Society	2	—	—	2
4.	EEC 241	Computer Programming	1	—	2	2
5.	MEC 301	Fundamental of Engineering Design	2	1	—	3
6.	MEC 303	Stress Analysis	2	—	3	3
7.	MEC 304	Instrumentation and Control	1	—	3	2
8.	MEC 305	Mechanics of Machines	2	—	3	3
		Total	14	1	11	19

SEMESTER TWO

S/No.	Code	Title	L	T	P	CU
1.	GNS 302	Communication in English III	2	—	—	2
2.	MTH 312	Advanced Calculus	2	—	—	2
3.	GNS 420	Industrial Management	2	—	—	2
4.	MEC 302	Mechanical Structural Analysis	2	—	3	3
5.	MEC 306	Fluid Mechanics	2	—	3	3
6.	MEA 302	Engines and Transmission Technology and Practice	2	—	3	3
7.	MEA 304	Power and Refrigeration Cycles	1	—	2	2
8.	MEA 306	Automotive Electricity	1	—	2	2
9.	MEA 308	Mechanics of Motor Vehicles	1	—	3	2
		Total	15	—	16	21

SEMESTER THREE

S/No.	Code	Title	L	T	P	CU
1.	MTH 321	Numerical Methods	2	—	—	2
2.	MEC 401	Environmental Engineering	2	—	—	2
3.	MEA 401	Chassis and Vehicle Body Technology	2	—	3	3
4.	MEA 403	Thermo-fluids in I.C. Engines	2	—	3	3
5.	MEA 405	Technology of Vehicle Dynamics and Control Systems	2	—	3	3
6.	MEA 407	Design of Vehicle Control Systems	2	—	3	3
7.	MEA 409	Workshop Organisation and Administration	2	—	—	2
8.	MEC 400	Project	1	—	—	1
			15	—	12	19

ESTER FOUR

Code	Title	L	T	P	CU	CH
MTH 313	Statistical Methods in Engineering	2	—	—	2	2
MEA 402	Fluid Power Engineering	1	—	2	2	3
MEA 404	Engines and Transmission Design	2	—	3	3	5
MEA 406	Transport Economics	2	—	—	2	2
MEA 408	Venicle Structure	2	2	—	4	4
MEA 410	Engines Performance Testing and Tribology	1	—	3	2	4
MEC 400	Project	—	—	—	—	—
		10	2	8	15	20

BUILDING SERVICES AND REFRIGERATION ENGINEERING TECHNOLOGY OPTION

ESTER ONE

15 weeks/semester
Hours/week.

).	Code	Title	L	T	P	CU	CH
	GNS 301	Use of English III	2	—	—	2	2
	MTH 311	Advanced Algebra	2	—	—	2	2
	GNS 311	Engineer in Society	2	—	—	2	2
	ECC 241	Computer Programming	1	—	2	2	3
	MEC 301	Fundamental of Engineering Design	2	1	—	3	3
	MEC 303	Stress Analysis	2	—	3	3	5
	MEC 304	Instrumentation and Control	1	—	3	2	4
	MEH 301	Applied Thermodynamics	2	—	3	3	5
		Total	14	1	11	19	26

ISTER TWO

).	Code	Title	L	T	P	CU	CH
	GNS 302	Communication in English III	2	—	—	2	2
	MTH 312	Advanced Calculus	2	—	—	2	2
	GNS 420	Industrial Management	2	—	—	2	2
	MEC 302	Mechanical Structural Analysis	2	—	3	3	5
	MEC 306	Fluid Mechanics	2	—	3	3	5
	MEH 303	Electrical Power and Machines	3	—	3	4	5
	MEH 302	Energy Conversion and Heat Transfer	2	—	3	3	5
		Total	15	—	12	19	26

SEMESTER THREE

S/No.	Code	Title	L	T	P	CU
1.	MTH 321	Numerical Methods	2	—	—	2
2.	MEH 304	Industrial Safety	2	—	—	2
3.	MEB 401	Cooling and Load Estimation	2	1	—	3
4.	MEB 403	Mechanical Equipment in Buildings	2	—	3	3
5.	MEB 405	Refrigeration Systems	2	—	3	3
6.	MEB 407	Sewage Treatment and Waste Disposal	2	1	—	3
7.	MEC 400	Project	1	—	—	1
			13	2	6	17

SEMESTER FOUR

S/No.	Code	Title	L	T	P	CU
1.	MTH 313	Statistical Methods in Engineering	2	—	—	2
2.	MEB 402	Airconditioning	2	1	3	4
3.	MEB 404	Piping Design	2	1	—	3
4.	MEH 406	Maintenance Management	3	—	—	3
5.	MEB 406	Electro-mechanical Controls in Refrigeration and Airconditioning	2	—	3	3
6.	MEC 400	Project				
			11	2	6	15

MACHINE BUILDING ENGINEERING TECHNOLOGY OPTION

SEMESTER ONE

15 Weeks/Semester
Hours/Week.

S/No.	Code	Title	L	T	P	CU
1.	GNS 301	Use of English III	2	—	—	2
2.	MTH 311	Advanced Algebra	2	—	—	2
3.	GNS 311	Engineer in Society	2	—	—	2
4	EEC 241	Computer Programming	1	—	2	2
5.	MEC 301	Fundamentals of Engineering Design	2	1	—	3
6.	MEC 303	Stress Analysis	2	—	3	3
7.	MEC 304	Instrumentation and Control	1	—	3	2
8.	MEC 305	Mechanics of Machines	2	—	3	3
			14	1	14	19

'STER TWO

Code	Title	L	T	P	CU	CH
GNS 302	Communication in Englis: III	2	—	—	2	2
MTH 312	Advanced Calculus	2	—	—	2	2
GNS 420	Industrial Management	2	—	—	2	2
MEC 302	Mechanical Structural Analysis	2	—	3	3	5
MEC 306	Fluid Mechanics	2	—	3	3	5
MEM 302	Engineering Materials and Applic:tions	2	—	—	2	2
MEM 304	Heat Treatment	2	—	3	3	5
MEP 306	Foundry Technology and Practice I	2	—	3	3	5
	Total	16	—	12	20	28

ESTER THREE

15 Weeks/Semester
Hours/Week.

Code	Title	L	T	P	CU	CH
MTH 321	Numerical Methods	2	—	—	2	2
MEP 405	Jigs and Fixtures Design	2	—	3	3	5
MEP 407	Production Management	2	1	—	3	3
MEP. 410	Metrology and Quality Control	2	—	3	3	5
MEM 403	Hydraulics and Pneumatics	1	—	3	2	4
MEM 405	Machine Elements Design I	2	1	—	3	3
MEM 407	Machine Tool Processes I	2	—	3	3	5
MEC 400	Project	1	—	—	1	1
	Total	14	2	12	20	28

'STER FOUR

Code	Title	L	T	P	CU	CH
MTH 313	Statistical Methods in Engineering	2	—	—	2	2
MEM 402	Machine Tool Design I	1	2	—	3	3
MEM 406	Numerical Control of Machine Tools	2	—	3	3	5
MEM 408	Machine Elements Design II	1	—	3	2	4
MEP 408	Foundry Technology and Practice II	2	—	3	3	5
MEM 410	Machine Tool Processes II	2	—	3	3	5
MEM 412	Machine Assembling, Installation and Commissioning	2	—	3	3	5
MEC 400	Project					
	Total	12	2	15	19	29

PRODUCTION ENGINEERING TECHNOLOGY OPTION

SEMESTER ONE

15 Weeks/Semester
Hours/Week.

S/No.	Code	Title	L	T	P	CU
1.	GNS 301	Use of English III	2	—	—	2
2.	MTH 311	Advanced Algebra	2	—	—	2
3.	GNS 311	Engineer in Society	2	—	—	2
4.	EEC 241	Computer Programming	1	—	2	2
5.	MEC 301	Fundamentals of Engineering Design	2	1	—	3
6.	MEC 303	Stress Analysis	2	—	3	3
7.	MEC 304	Instrumentation and Control	1	—	3	2
8.	MEC 305	Mechanics of Machines	2	—	3	3
		Total	14	1	11	19

SEMESTER TWO

S/No.	Code	Title	L	T	P	CU
1.	GNS 302	Communication in English III	2	—	—	2
2.	MTH 312	Advanced Calculus	2	—	—	2
3.	GNS 420	Industrial Management	2	—	—	2
4.	MEC 302	Mechanical Structural Analysis	2	—	3	3
5.	MEC 306	Fluid Mechanics	2	—	3	3
6.	MEP 302	Metal Forming	2	—	3	3
7.	MEP 304	Welding and Fabrication Processes	2	—	3	3
8.	MEP 306	Foundry Technology and Practice I	1	—	3	2
		Total	15	—	15	20

SEMESTER THREE

S/No.	Code	Title	L	T	P	CU
1.	MTH 321	Numerical Methods	2	—	—	2
2.	MEP 401	Metrology and Quality Control	2	—	3	3
3.	MEP 403	Testing and Failure of Materials	2	—	3	3
4.	MEC 401	Environmental Engineering	2	—	—	2
5.	MEP 405	Jigs and Fixtures Design	2	1	—	3
6.	MEP 407	Production Management	2	1	—	3
7.	MEC 400	Project	1	—	—	1
		Total	13	2	6	17

SEMESTER FOUR

S.No.	Code	Title	L	T	P	CU	CH
1.	MTH 313	Statistical Methods in Engineering	2	—	—	2	2
2.	MEP 402	Machine Tools Control	2	—	—	2	2
3.	MEP 404	Machine Tools Processes	1	—	3	2	4
4.	MEP 406	Press and Cutting Tools Design	2	—	3	3	5
5.	MEP 408	Foundry Technology and Practice II	2	—	3	3	5
6.	MEP 410	Materials Handling	2	—	—	2	2
7.	MEC 400	Project	—	—	—	—	—
		Total	11	—	9	14	20

POWER/PLANT ENGINEERING TECHNOLOGY OPTION

SEMESTER ONE

15 Weeks/Semester
Hours/Week.

S.No.	Code	Title	L	T	P	CU	CH
1.	GNS 301	Use of English III	2	—	—	2	2
2.	MTH 311	Advanced Algebra	2	—	—	2	2
3.	GNS 311	Engineer in Society	2	—	—	2	2
4	EEC 241	Computer Programming	1	—	2	2	2
5.	MEC 301	Fundamentals of Engineering Design	2	1	—	3	3
6.	MEC 303	Stress Analysis	2	—	3	3	5
7.	MEC 304	Instrumentation and Control	1	—	3	2	4
8	MEC 305	Mechanics of Machines	2	—	3	3	5
		Total	14	1	11	19	26

SEMESTER TWO

S.No.	Code	Title	L	T	P	CU	CH
1.	GNS 302	Communication in English III	2	—	—	2	2
2.	MTH 312	Advanced Calculus	2	—	—	2	2
3.	GNS 420	Industrial Management	2	—	—	2	2
4	MEC 302	Mechanical Structural Analysis	2	—	3	3	5
5.	MEC 306	Fluid Mechanics	2	—	3	3	5
6.	MEH 302	Energy Conversion and Heat Transfer	2	—	3	3	5
7	MEH 304	Industrial Safety	2	—	—	2	2
		Total	14	—	9	17	23

SEMESTER THREE

15 Weeks/Semester
Hours/Week.

S/No.	Code	Title	L	T	P	CU	CH
1.	MTH 321	Numerical Methods	2	—	—	2	2
2.	MEM 401	Fluid Power Machines	2	—	3	3	5
3.	MEC 401	Environmental Engineering	2	—	—	2	2
4.	MEH 403	Internal Combustion Engines	3	—	3	4	6
5.	MEC 400	Project	1	—	—	1	1
		Total	10	—	6	12	16

SEMESTER FOUR

S/No.	Code	Title	L	T	P	CU	CH
1.	MTH 313	Statistical Methods in Engineering	2	—	—	2	2
2.	MEH 402	Construction and Materials Handling Equipment	3	—	3	4	6
3.	MEH 404	Steam Power Generation and Works Services	3	—	3	4	6
4.	MEH 406	Maintenance Management	3	—	—	3	3
5.	MEC 400	Project	—	—	—	—	—
		Total	11	—	6	13	17

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