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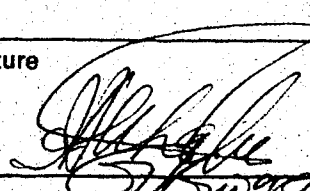

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A MODEL VOCATIONAL AGRICULTURE CURRICULUM FOR SECONDARY SCHOOLS OF KANO STATE, NIGERIA

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

IN

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DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION

EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A MODEL VOCATIONAL AGRICULTURE CURRICULUM FOR THE SECONDARY SCHOOLS OF KANO STATE, NIGERIA, submitted by Ibrahim Adamu Khaleel in partial fulfilment of the requirements for the degree of Master of Education in Vocational Education.

Supervisor

Date August 13, 1980

DEDICATION

To my parents and the people of Kano State, I dedicate this thesis.

ABSTRACT

The purpose of this study was to review and perform a content analysis of existing programs of studies in vocational agriculture that were offered in selected high schools in the Mountain Plains Region of the United States of America, and from this analysis develop a model vocational agriculture curriculum for the secondary schools of Kano State, Nigeria.

In order to conduct the research two populations were involved. The first population consisted of 20 state supervisors of vocational agriculture in the Mountain Plains Region of the United States, who were asked to cooperate in the study by furnishing the researcher with the names and addresses of the principals of secondary schools in their states where a program in vocational agriculture was taught. Of the 20 letters that were mailed, 14 replies were received representing a 70% return. The second population consisted of school administrators or principals and their schools whose names were received from the state supervisors of vocational agriculture. To identify the second population, criteria were established for selecting schools and random numbers were generated to select the 35 schools that were asked to participate in the study.

A letter was mailed to the administrators of the

35 participating schools asking them to make available to the researcher any of the following curriculum materials (numbers in parentheses indicate the quantity of each curriculum material received): course outline (4), curriculum guide (4), course description (4), course of study (3), program of study (1), course guide (1), and syllabus (0). The content of these curriculum materials were reviewed and analyzed to determine if they contained the curriculum components that were identified from the literature on curriculum.

Findings from the content review and analysis indicated that only three out of the 17 documents that were analyzed contained a statement of philosophy on vocational agriculture. Fourteen of the 17 curriculum materials reviewed included statements of aims, goals or objectives while all the received materials contained curriculum content. Learning experiences were provided in 10 of the 17 curriculum documents that were reviewed and analyzed; however, only two of these materials contained evaluation schemes.

From the research a paradigm and a curriculum model were developed and the suggested vocational agriculture curriculum was fitted into both the paradigm and the curriculum model.

On the basis of the data and the findings of the research, observations and conclusions of this study were formulated and recommendations were made to the authorities of the Kano State Ministry of Education.

ACKNOWLEDGEMENTS

The author of this report wishes to express his gratitude, thanks and appreciation to the following for their advice, co-operation, understanding and criticisms that were given to him during the time of this study.

This study was made possible by the excellent co-operation, understanding, long hours of reading of the draft, endless meetings and hard work received from Dr. Clarence H. Preitz who was the supervisor and the chairman of the author's thesis committee. To him, the author extends a special note of thanks and gratitude.

To Drs. A.K. Clark, Department of Industrial and Vocational Education and Jean Young, Department of Elementary Education all of the University of Alberta, the author wishes to express his sincere appreciation for serving as members of the thesis committee and for their advice.

These acknowledgements will not be complete without my express and sincere thanks and appreciation to Dr. H.P. Lapp, Department of Agricultural Engineering, The University of Manitoba and Dr. Gordon Yaciuk, International Development Research Centre, Edmonton, who served as reviewers of the content of the suggested vocational Agriculture curriculum for secondary schools of Kano State, Nigeria. Their advice, comments and criticism greatly

enhanced the quality of the recommended curriculum. Grateful appreciation is also expressed to state supervisors of vocational agriculture in the Mountain Plains Region of the United States who assisted the researcher by providing the names and addresses of the principals of secondary schools in their state that offered a program in vocational agriculture; to the school administrators who furnished the author with the necessary curriculum materials that made this study possible.

To my Nigerian friends, and in particular Messrs. Alhasan Yusuf and Nasiru Ahmed for taking the trouble of sending some documents from Nigeria, I am deeply thankful. To Miss Joanna Lubberts, who worked so patiently and diligently in typing this manuscript, I am grateful.

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CHAPTER I

THE PROBLEM

In 1970 Nigeria was the world's largest exporter of peanuts (groundnuts) with 291,000 metric tonne (MT) being exported. However, in 1973 only 30,000 MT of this crop left the country. The export of peanuts was formally prohibited by the Nigerian Government in 1976. The farmers in the Northern part of the country supplied almost half of the peanuts that were exported from Nigeria. In an article, Smith (1979) pointed out that:

> The Northern states {of which Kano State is one} are the centre of groundnuts {peanut} cultivation, which covers nearly 2.3 million acres, almost half falling in Kano State. There are about 1.1 million farmers. Groundnuts are a peasant cash crop, with average holdings averaging 2 - 4 acres. (p. 930)

In another article, a correspondent in the West African Magazine had this to say about Kano State as a producer of peanuts:

> Probably no land in Africa has been farmed continuously so long as that of Kano Emirate. Today this land yields increasing quantities of groundnuts, making the state the biggest producer of this crop in Nigeria, with about half total population. (1970, p. 452)

In the late 1970's, Nigeria in general, and Kano State in particular found itself in a situation whereby not only the production of such cash crops as peanuts, coffee, cocoa, cotton and palm kernels declined, but some food crops such as rice and palm oil had to be imported to satisfy the needs of the country.

The causes for the decline in agricultural production can be attributed to either natural or alien causes. Natural causes were: floods that occurred in some parts of Southern Nigeria, and the drought of 1973-74 that took place in the Northern part of the country. Alien causes were: government policies that established marketing boards for various crops (e.g., groundnuts, cocoa, and cotton to name a few), control on price of agricultural products by the Federal government through the marketing boards, and the prominence given to production of oil at the expense of the agricultural sector of the economy. Smith (1978) emphatically pointed this out when he wrote:

> Nigeria is overwhelmingly dependent on a single commodity, petroleum, which constitutes more than 90 percent of {the} total exports.
>
> The shift reflects not only the dramatic surge in oil production but also a long period of stagnation for agricultural production. (p. 877)

Another important factor that led to the decline of agriculture was the migration of the youth from rural areas to urban centres in order to have a "share in the national cake" or the "oil boom." These youths were attracted by the rapid industrialization of the urban centres, the perceived

availability of work on the part of the youth, lack of social and recreational facilities in the rural areas, and the lack of improvement in farming techniques.

Lack of the appropriate education has been cited by authorities as another cause of the decline of agriculture in Nigeria. Some of these individuals are concerned that the Nigerian educational system is cognitively oriented. In an article, Damper (1979) pointed out that "the fault lies with our system of education which focuses more attention on literacy and numeracy . . . . The system can be said to be too 'bookish'" (p. 6).

Nigeria's foreign reserves have been continually reduced because of the need to import foodstuffs. This resulted in more attention being directed to the problems that faced the agricultural sector--greater food production.

The Federal Government in its White paper on National Policy on Education (1977) made a strong reference to agriculture and its cause when it stated:

> In respect of agriculture, Government has already launched a nation-wide programme of mass participation in and orientation towards food production. Facilities will be available for effective participation in these programmes by providing farm implements, fertilizers, seeds and seedlings and the services of the extensive staff of various State Ministeries of Agriculture. (p. 8)

In a recent speech delivered before the Nigerian National Assembly, President Shehu Shagari (1979) *inter alia*,

took a similar position when he said:

> Joint ventures with foreign partners in the field of large scale agriculture will be encouraged and assisted. Emphasis will be placed on modern techniques of farming, storage, distribution and processing {which constitute agri-business}. . . .
>
> My administration will encourage the local manufacture of light farming tools and machinery. (p. 8)

All the above government concern and efforts to boost agricultural production are laudable; however, no appreciable result will be achieved without the provision of the appropriate education and training to those who are to participate in such government efforts. To provide modern farming implements to the farmers who lack the knowledge and skills necessary for their use will not alleviate the problem of the decline in agricultural production. A similar view was expressed by Lapp (1973) that:

> The introduction of mechanization into the practice of agriculture in the States {the Northern States} has presented a current and urgent need for the training of tractor operators and mechanics . . . .
>
> The efficiency of agricultural mechanization is dependent upon skillful management and a high standard of servicing, maintenance, repair and overhaul program in mechanical workshops. (p. 16)

Result of a preliminary search conducted by the author on the educational system of Nigeria reveals that there is no vocational agriculture program of study that is offered at the secondary school level in Nigeria in general,

and Kano State in particular. There is, however, an agricultural science syllabus available for those students who are preparing for a college education in this field. For those secondary school students who are interested in agriculture as a vocation, their chances are limited because they are denied the right to pursue a career in agriculture. There is, therefore, an urgent need for the development of a program of study in vocational agriculture at the secondary school level for these students.

Statement of the Problem

The purpose of this study was to review and analyze existing programs of studies in vocational agriculture that are offered in selected high schools from the Mountain Plains Region of the United States of America, and from this analysis develop a model vocational agriculture curriculum for the secondary schools in Kano State, Nigeria.

Significance of the Study

The review of the literature shows that the government of Nigeria has made efforts to solve its problem of the decline in agricultural production. Considerable attention has been given by the government to the ways of boosting both agricultural production as well as employment in this sector of the economy, and to increase the amount of foodstuffs available in the nation.

It was with this view in mind that a vocational

agriculture program at the secondary school level in Kano State, Nigeria was developed. The program should be broad and flexible, such that students who satisfactorily achieve its objectives could move directly to employment or continue with their college studies.

The results of this study may be significant because they might be used by educational planners to design and implement a program of studies in vocational agriculture that is appropriate for use in secondary schools in Nigeria.

The outcomes of this study may also have significance by identifying the blocks of instructional content that might be used by teachers of vocational agriculture as they prepare their basic units of instruction.

Another aspect that may be generated by the results of this study is the instructional material that may be used to support instructional content. The results of a study such as this for a developing nation like Nigeria is that it may serve as the foundation of an articulate program in agriculture beginning and extending through the tertiary level of education.

Objectives of the Study

This study had the following general and supporting objectives.

General Objective. The general objective of this study was to develop a curriculum of vocational agriculture for the secondary schools in Kano State, Nigeria.

Supporting Objectives. This study had the following supporting objectives:

1. To review secondary school vocational agriculture programs from selected high schools from the Mountain Plains Region of the United States of America that meet the criteria established for selecting these schools.
2. To identify the major components of the programs, course outlines, course descriptions, curriculum guides or syllabi for vocational agriculture at the secondary school level that were received from participating schools that may have relevance for the model curriculum of vocational agriculture that was developed.
3. To determine the scope of the vocational agriculture programs, course outlines, course descriptions or syllabi that were offered in the secondary schools that were involved in the research.
4. To determine the sequence of courses that comprise the vocational agriculture curricula that were offered in the secondary schools that made up the population of this study.

Limitations of the Study

The following are the limitations that were imposed on this study.

The study was limited to the vocational agriculture programs from selected secondary schools in the Mountain Plains Region in the United States of America

(U.S.A.) that were asked to become involved in this investigation.

The study was also limited by the kinds of information that was furnished the researcher, such as curriculum guides, programs of studies, program descriptions, courses of studies, or syllabi for vocational agriculture that were received from selected high schools in the Mountain-Plains Region of the U.S.A., that were participants of the research.

Another limitation of the study was the kind of information that a library research yielded on the current concepts and trends that vocational agriculture at the secondary school level will take in the next decade.

Assumptions

The central assumption for this study was that the instructional content that was identified from the curriculum guides, programs of studies, program descriptions, courses of studies or syllabi that were received from participants included the basic concepts and principles which must be presented to students in a vocational agriculture program if they are to receive an education that is relevant to that occupation.

Another assumption for this study was that the advice received from experts who were selected to review the model vocational agriculture curriculum and who served in Nigeria under the auspices of Canadian International Development Agency (CIDA) was reliable and valid.

Finally, it was assumed that from the review and content analysis of the vocational agriculture programs, programs of studies, course outlines, course descriptions or syllabi, sufficient data was gathered to develop a model curriculum in vocational agriculture for the secondary schools in Kano State, Nigeria.

Definitions of Terms

The following were the operational definitions of terms that were used throughout this study.

Agricultural Education. The definition of the term agricultural education varies with the author writing on this topic. There are as many definitions for this term as there are authors. For the purposes of this study, the definition given by Stevens (1967) was found to be suitable. Stevens defines agricultural education as:

> Education in agriculture for the specific purpose of contributing to the occupational development of each student. It is education that is relevant to personal achievement of economic goals. (p. 1)

Agriculture. A review of the literature indicates there are a number of definitions for the term agriculture. The definition by Hammons (1950) was accepted as an operational definition for this study. According to Hammons:

> Agriculture has to do with farming. It is both an art and a science. As an art it is a composite of manipulative skills in the control of plant and animal life in producing utilities for man. As a science agriculture has its organized body of knowledge of causes, effects, laws, principles, for guiding and

> directing the agricultural skills. Agriculture is also both a method of making a living and a mode of life. (p. 3)

Curriculum. The word "curriculum" has as many meanings as the authors writing on this topic. Many definitions were reviewed in detail and the definition by Derr (1977) was selected for this investigation. Derr states: "curriculum is used to refer to a set of things, which are taught, designated for learning, and given to pupils to be learned by them" (p. 152).

Program. The operational definition that will be used for the term "program" was Pautler's (1971) who defines program as:

> The pursuit of a certain specialization such as cosmetology, electronics, etc. Course is defined as one segment of the total program. A unit is still a smaller sub-division of a course. (p. 52)

Vocational Agriculture. After reviewing a number of definitions for the term vocational agriculture, the researcher selected the one by Good (1973). This author defines vocational agriculture as: "education in agriculture for persons engaged in or expecting to engage in an agricultural occupation, either nonfarm or farm" (p. 23).

Vocational Education. Living in a dynamic society where technology, occupations, and culture are changing rapidly, a definition of vocational education should take these phenomena into consideration. It is in this context that Thompson (1973) defined vocational education in this way:

> Vocational education is any education that provides experience, visual stimuli, affective awareness, cognitive information, or psychomotor skills; and that enhances the vocational development processes of exploring, establishing, and maintaining oneself in the world of work. (p. 216)

Population

The study had two distinct populations. The first population constituted personnel who hold administrative positions in vocational agriculture in state departments of education located in the Mountain Plains Region of the United States of America.

The following states are identified as forming the Mountain Plains Region: Colorado, Iowa, Kansas, Minnesota, Nebraska, North Dakota, South Dakota, Utah, and Wyoming.

This region, and the states that make up the region, were selected to be involved in the research because some of the farm crops from this region are similar to the farm crops of Kano State. Another reason for selecting this region was that the topography of the region and the soils found in this region are similar to that of Kano State, Nigeria.

The second population for this study included the principals of all the secondary schools in the Mountain Plains Region where a program in vocational agriculture was offered. How this population was identified is discussed in the appropriate section on methodology.

Sample

From the second population, a random sample was selected using a table of random numbers, until a sample of 50 percent of the schools that meet the criteria established for the research were selected. Each school was assigned a serial number.

To generate a table of random numbers, computer program APL PAR = D of the Division of Educational Research Services (DERS), University of Alberta was used.

Methodology

A search of the Educational Research Information Centre (ERIC) data base was conducted by the researcher to identify reference sources that were concerned with the current concepts, principles and practices in vocational agriculture. The following ERIC descriptors were used to conduct the information retrieval search: agricultural colleges, agricultural education, agribusiness, agricultural occupations, agricultural trends, agricultural research projects, vocational agriculture, and vocational agriculture teachers.

To identify schools in the Mountain Plains Region of the United States of America (U.S.A.) that offer a program in vocational agriculture at the secondary school level, a manual library research was made of periodicals that are concerned with vocational education. In addition, educational indexes that report the findings of educational

research were reviewed. The purpose of these searches was to identify state supervisors of vocational agriculture in the states that comprised the survey area for this study.

The researcher composed a letter that was sent to the state supervisors of vocational agriculture in Mountain Plains States who were identified in the previous step. The purpose of this letter was to ask the co-operation of these supervisors to participate in the study by furnishing the researcher with the names and addresses of the principals of secondary schools in their states where a program in vocational agriculture was taught. A total of 20 letters were mailed to the state supervisors. Appendix A, page 216, includes a list of the names and addresses of the state supervisors involved in this phase of the research as well as a copy of the letter that was mailed. Of the 20 letters that were mailed, 14 replies were received representing a 70% return.

For those state supervisors who were deliquent and who did not provide the requested information by the established deadline date, a follow-up letter was prepared and mailed. The purpose of the follow-up letter was to increase the rate of return for the names of the principals and the names and addresses of their schools in which a program in vocational agriculture (see Appendix B, page 220) was offered. The follow-up letter did not yield any additional returns of the materials that were requested. Out of the nine states of the Mountain Plains Region, returns were received from the following seven states: Iowa, Kansas,

Minnesota, North Dakota, South Dakota, Utah and Wyoming. No response was received from either Colorado or Nebraska.

Criteria were established that were used to select those secondary schools to participate in this study from the list of schools that were received from each participating state supervisor. For selecting these schools, these were the criteria that were used:

1. THE SCHOOL SHOULD ENROLL AT LEAST 500 STUDENTS IN ITS PROGRAMS. Curriculum Information Center (CIC), School Directory: School Year 1978-79, Volume V; Mountain Plains Region, was the reference source that was used to verify each school selected that satisfied this criteria.
2. THE SCHOOL MUST OFFER AN ARTICULATED PROGRAM OF VOCATIONAL AGRICULTURE THAT INCLUDES COURSES THAT ARE OFFERED IN GRADES 10, 11 and 12. To verify if the selected schools meet this criterion the CIC's School Directory: School Year 1978-79, Volume V; Mountain Plains Region, was used.
3. THE SCHOOL MUST EMPLOY AT LEAST TWO VOCATIONAL AGRICULTURE TEACHERS. To identify the schools that satisfy this criterion, the list of principals and the names and addresses of their schools that was received from the state supervisors of vocational agriculture in the Mountain Plains States was used as the reference source.
4. THE SERVICE AREA (COUNTY) WHICH THE SCHOOL SERVES MUST HAVE A POPULATION BASE LARGER THAN 25,000 INHABITANTS. To identify if the schools that were selected to participate in the study meet this criterion the County and

City Data Book 1977: A Statistical Abstract Supplement by the U.S. Department of Commerce Bureau of the Census 1977 was used.

From the list of secondary school personnel involved in teaching vocational agriculture and the schools that met the criteria established for this research, a random sample was selected to participate in the research. Seventy schools out of over 1000 schools were identified to satisfy the criteria established to select schools used for this study. To select the random sample for this study, a table of random numbers was generated using computer program APL PAR = D from the Division of Educational Research Services (DERS) of the University of Alberta. The sample selected was 50% of those schools that were identified by the researcher as meeting the criteria established for selecting participating schools. This procedure yielded 35 schools.

The researcher prepared a letter that was mailed to the administrators of the 35 schools selected to participate in the research asking them to cooperate in the research by providing the researcher with course outlines, curriculum guides, programs of studies, course descriptions, and syllabi. This initial letter of contact also explained the role that the participants would have in the study. Included in this mailing was a self-addressed stamped envelope for the participants to return the information that was requested (see Appendix C, page 222, which includes a

copy of the letter). Of the 35 letters that were mailed, 18 (51.4%) replies were received.

For those participants who did not meet the deadline date, a follow-up letter was prepared and mailed. The major purpose of the follow-up letter was to increase the rate of return for course outlines, curriculum guides, programs of studies, course descriptions, and syllabi that were analyzed and provided information to design the model vocational agriculture curriculum for secondary schools of Kano State, Nigeria (Appendix D, page 228, includes a copy of the follow-up letter). This procedure resulted in one additional response. Of the 19 responses that were received, however, two were unusable for the following reasons: one letter was returned because the vocational agriculture teacher was no longer at the school; and in one school the vocational agriculture program was offered at the post secondary school level only.

The curriculum guides, programs of studies, course outlines, and syllabi that were received from participants were analyzed to determine if they included the following curriculum components: a philosophical statement in support of vocational agriculture; performance objectives and content to be taught to the learner. These curriculum materials were also analyzed to determine if there was articulation with other academic disciplines such as mathematics and science, including both the natural and the physical sciences.

To assist in the design of the proposed model vocational agriculture curriculum for the secondary schools of Kano State, a review was made of the works of curriculum model builders such as Johnson Jr., MacDonald, Taba, and Tyler. The purpose of this review was to help the researcher identify major components that should be integrated into any model program for a secondary education program in vocational agriculture.

After the model was designed, it was placed in the hands of specialists in agriculture who reside in Alberta or Canada and who have served in Nigeria under the auspices of the Canadian International Development Agency (CIDA) as an agricultural specialist. The purpose of having this panel of consultants review the material was for them to determine if the components of the model were viable for this Nigerian state. The ideal situation should have been to place the developed model in the hands of Nigerian specialists in agriculture, but for the time limit within which the study was conducted and the communications difficulties in Nigeria, this procedure was impossible to follow.

Following this review by the panel of consultants, the comments and recommendations made by them for improving the model was made and the revised model was proposed to the educational authorities in Kano State, Nigeria.

CHAPTER II

REVIEW OF THE LITERATURE

Chapter I presented all phases of the research design and included the problem statement as well as the methodology that was used to carry out this study. The operational definitions that will be used throughout the study are also part of the content of the first chapter.

Chapter II is divided into three main sections. The first section deals with the educational system of Nigeria. In this section a heavy emphasis is placed on education in Kano State as well as description of traditional education in Nigeria. Content of the first section of this chapter also includes an overview of the structure of education in Nigeria with a description of agriculture education as it existed at the time of the study.

The second section of this chapter is devoted to a review and analysis of the writings of authorities who have written on the topics of curriculum design and curriculum development.

The third and last section of the second chapter is concerned with the research that has been completed on agricultural education at the secondary school level that is related to this study.

Nigeria--Its Geographical Location

Nigeria is located on the west coast of Africa, lying within the tropics, it is bounded on the west by the Republic of Benin, on the north by the Niger Republic, and on the east by the Republic of Cameroun. The southern boundary of Nigeria is the Atlantic Ocean. Figure 1 shows the location of Nigeria within the African continent.

Nigeria has a land area of 913,072.64 square kilometres (km^2) with two major rivers, the Benue and the Niger. It is from the latter river that the name "Nigeria" was derived. The climate of the country varies from tropical at the coast to sub-tropical further inland. There are two main seasons, the dry season lasting from November to March and the rainy season from April to October. Humidity is high with temperatures varying from 90° to 110° F (Nigeria Dairy, 1979, p. 6).

Nigeria is considered a heterogeneous state with a population of approximately 70 million which includes a large number of Hausas, Fulains (Fulfulde), Ibos, Yorubas, Edos, Efiks, Ijaws, Tivs and Kanuris. The Hausa, Ibo and Yoruba are the dominant ethnic groups as well as the languages of Nigeria. English is the official language of this Nation.

As a political entity, Nigeria came into existence in 1914 when it was colonized by England. In the early part of this century England proclaimed as a protectorate Northern

Figure 1

Nigeria Within the African Continent

Source: New African Yearbook 1979, Facts and Figures, p. 9.

and Southern Nigeria. Later in its history, Nigeria was divided into the following three provinces: the Northern, the Western and the Eastern Provinces. The 1946 constitution made it possible for the three provincial (changed in 1946 to regional) administrations of these provinces to advise the central government on regional matters. Under a new constitution which was written in 1951, the three regional administrations were classified as regional governments under a ministerial system of government. In 1957, eastern and western regions of Nigeria were granted internal self-government. Two years later in 1959, northern Nigeria was granted the same status of self-government as the other two regions.

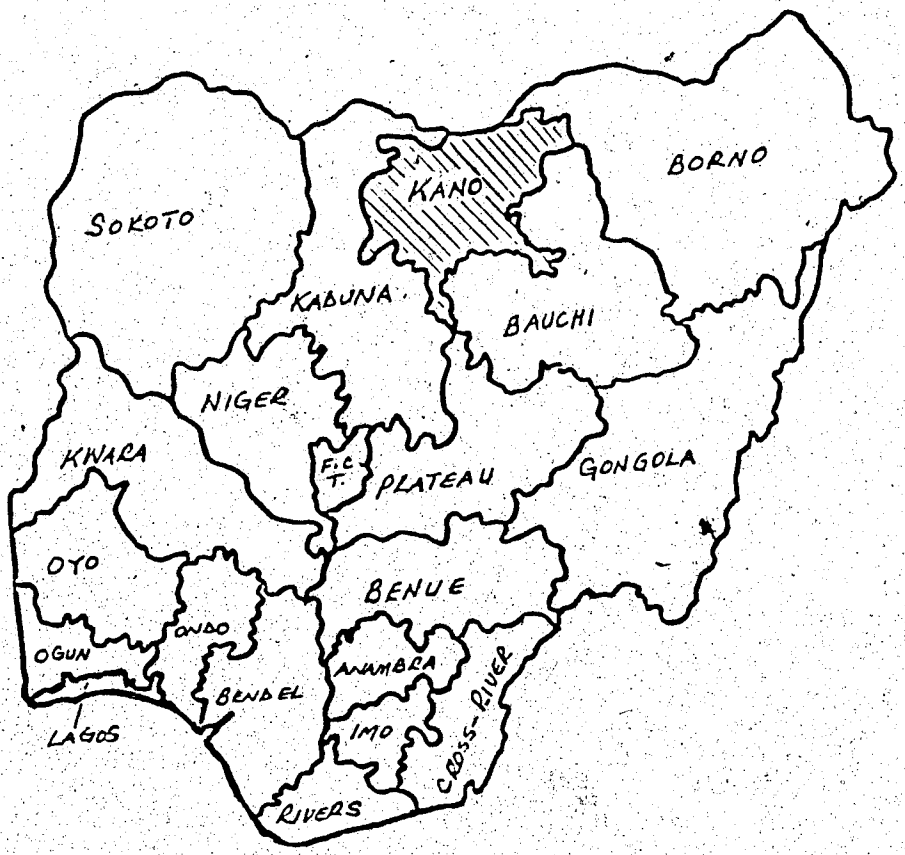
On October 1, 1960, Nigeria was granted independence from England and three years later on October 1, 1963 a Republican Constitution was adopted. In 1964, a new region, called Midwest region, was added to the three (Northern, Southern and Eastern Regions) existing ones. In 1967, the four regions of Nigeria were divided into twelve states. These twelve states were expanded to nineteen when seven new states were added on February 3, 1976. Figure 2 shows the nineteen states of Nigeria.

Government

Since independence in 1960, Nigeria has had five different governments. From 1960 to 1966, Nigeria was ruled by a civilian government, with a parliamentary system having an executive Prime Minister and a ceremonial President.

Figure 2

Map of Nigeria Showing the 19 States
and the Federal Capital Territory (F.C.T.)



Source: West African Magazine No. 3239, August 1979, front page.

Early in 1966, a military coup was conducted with General Ironsi as head of state. However, this military regime did not last long. Six months later, a second military coup took place. This coup brought General Gowon (then a Luitenant Colonel) to head the government. Gowon's regime lasted for nine years, from August 1966 to July 1975.

A third military coup occurred in July 1975. The late General Murtala Muhammed (then a brigadier) headed the government that was formed after Gowon was deposed. This regime initiated far reaching economic, political and social policies. Seven new states were created, a constitution drafting committee was established and given the mandate to draft a new constitution for returning Nigeria to civilian rule in 1979, new universities were created and new local government guidelines were established.

In February 1976 in an abortive coup, General Murtala was assassinated and was succeeded by General Obasanjo, who ruled the country until October 1, 1979. On that day General Obasanjo handed over the power of the government to a newly elected civilian government, which is headed by an executive president.

The Nigeria Economic Base

Nigeria is endowed with both human and mineral resources, with agriculture the mainstay of the economy. Agriculture has always been the most important single occupational activity of the Nigerian economy. The Nigeria

Diary (1979) gave support to this statement when it said, "Eighty percent of the total working population is engaged in it {agriculture} producing" such things as yams, cassava, plaintains, rice, beans, sugar-cane, and citrus fruits for food and cocoa, oil palm produce, groundnuts (peanuts), rubber, cotton, and timber "for export and also raw materials for industry" (p. 9).

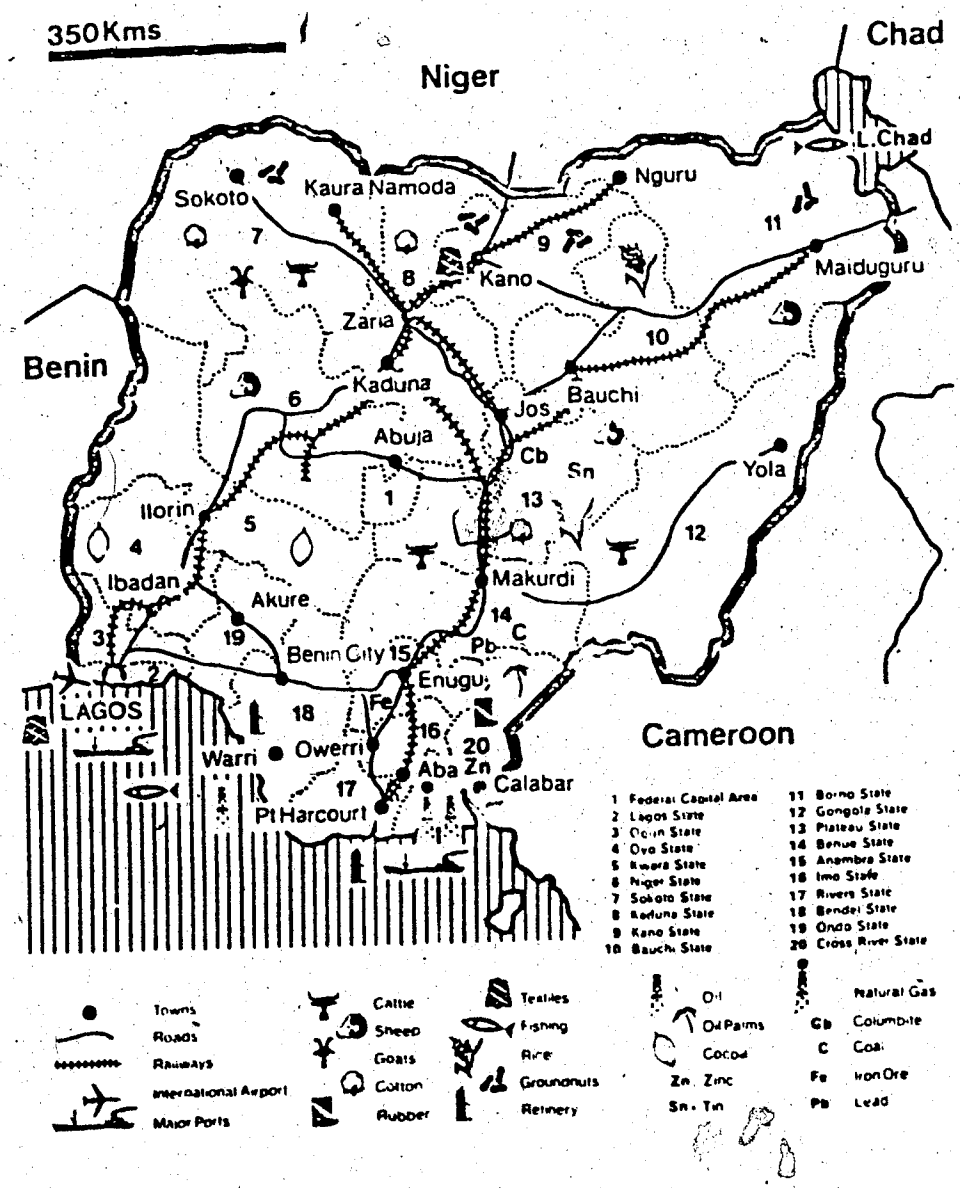
There are well over 2,000 industrial establishments in Nigeria that contribute modestly to the Gross National Product (GNP). In the 3rd National Development Plan (1975-1980) an allocation of one billion naira (approximately $2.0 billion Canadian dollars) was made to the steel industry which is expected to go into production by 1980 (Nigeria Diary, 1979, p. 10). The construction industries build commercial as well as residential structures, roads, bridges, etc. Manufacturing industries in Nigeria have moved progressively from the production of light consumer goods such as beer, soft drinks, cigarettes, shoes and textiles to the substitution of a wide range of other formerly imported goods like salt, plastics, aluminum goods, etc.

Nigeria has some mineral resources; chiefly among these are tin, columbite, limestone, coal and oil. At the time of this study, Nigeria was the sixth largest producer of crude petroleum in the world. Figure 3 shows the location of the resources of Nigeria.

Culturally, Nigeria is very rich because of the heterogenity of its population. Because of this diversity

Figure 3

Nigeria's Resources



Source: New African Yearbook 1979, Facts and Figures, p. 246.

its culture is rich, colourful, unique and something to make any Nigerian proud. According to the Nigeria Dairy (1979):

> Nigeria's unique position in the world of Black and African art and culture can hardly be disputed. Her population of about 70 million, the largest concentration of Black Peoples on earth, has endowed her with over 250 ethnic and language groups. This large number of cultural groups has consequently enhanced the nation's cultural diversity. In all areas of culture, therefore, Nigeria can boast of an immense variety. (p. 8)

In the field of ancient art, Nigeria is known because of the carving and sculpture of the Nok terra Cottas, some of which dated back to 2,000 B.C., the Benin bronzes, one of which was used as the emblem for the recently concluded 2nd World Black and African Festival of Arts and Culture (FESTAC) held in Lagos, Nigeria in 1977.

Kano State of Nigeria

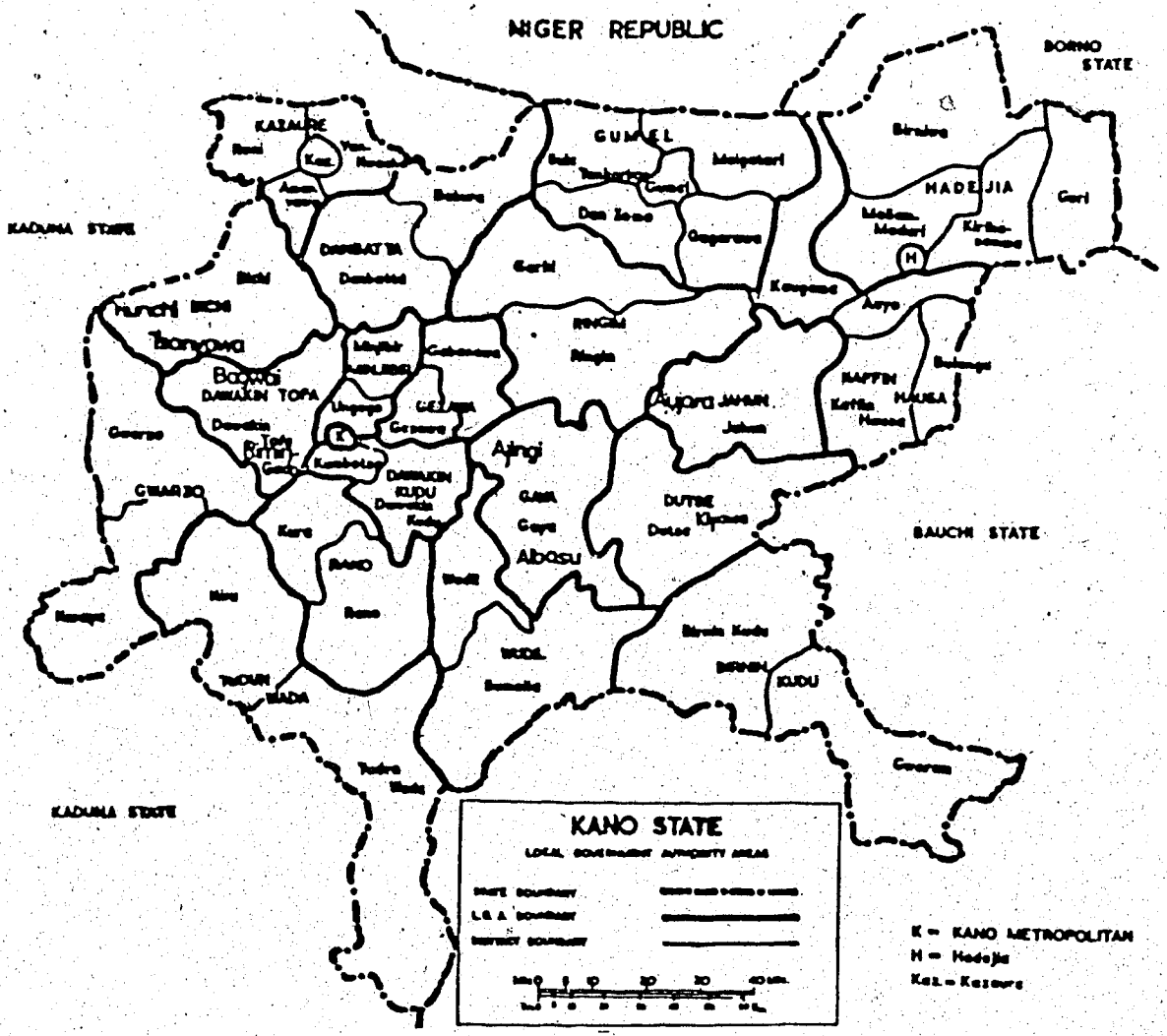
As previously stated, Nigeria is composed of nineteen states with a ministerial system of government for each of these states.

Kano State is one of the nineteen states of Nigeria, with an area of 16,630 square miles, and a population of more than 5,774,842, according to the 1963 census. Kano State has a population density of 374 inhabitants per square mile. Because of its dense population, Kano State is the second most heavily populated state in the Federation (Kano State Diary, 1977, p. 13). Figure 4 shows the location of Kano State in relation to its other neighbouring states.

When the twelve states were created in 1967 from

Figure 4

Kano State of Nigeria



Source: Kano State Handbook 1977, p. 108.

from the former provinces, Kano State was formed from old Kano Province which comprised the following four Emirates: Kano, Hadejia, Gumel and Kazaure.

Kano has a rich history which dates back to A.D. 999 when it became a Hausa Kingdom under Bagauda, who was the son of Bayajida, the founder of the Hausa dynasty. During the nine centuries of Hausa rule, both the Songhai and Borno Empires repeatedly invaded Kano. One of the best known Hausa Emirs was Mohammadu Rumfa, the twentieth emir of Kano, who ruled from A.D. 1473 - 1499 (Kano State Dairy 1977, p. 13). Rumfa introduced far-reaching reforms by:

> Extend{ing} the walls of Kano, building the Kurmi market, introducing new military formation . . ., building a palace and a Juma'a {Friday} Mosque, and inaugurating the observance of Id-el-Fitri {celebrations following the fast in the month of Ramadan}. (Kano State Handbook, 1977, p. 4)

In the 19th century, the Hausa rule came to an end when Shehu Usman Danfodio waged a Holy war against the decadent administration of Hausa Emirs. Today Kano is ruled by Fulani emirs.

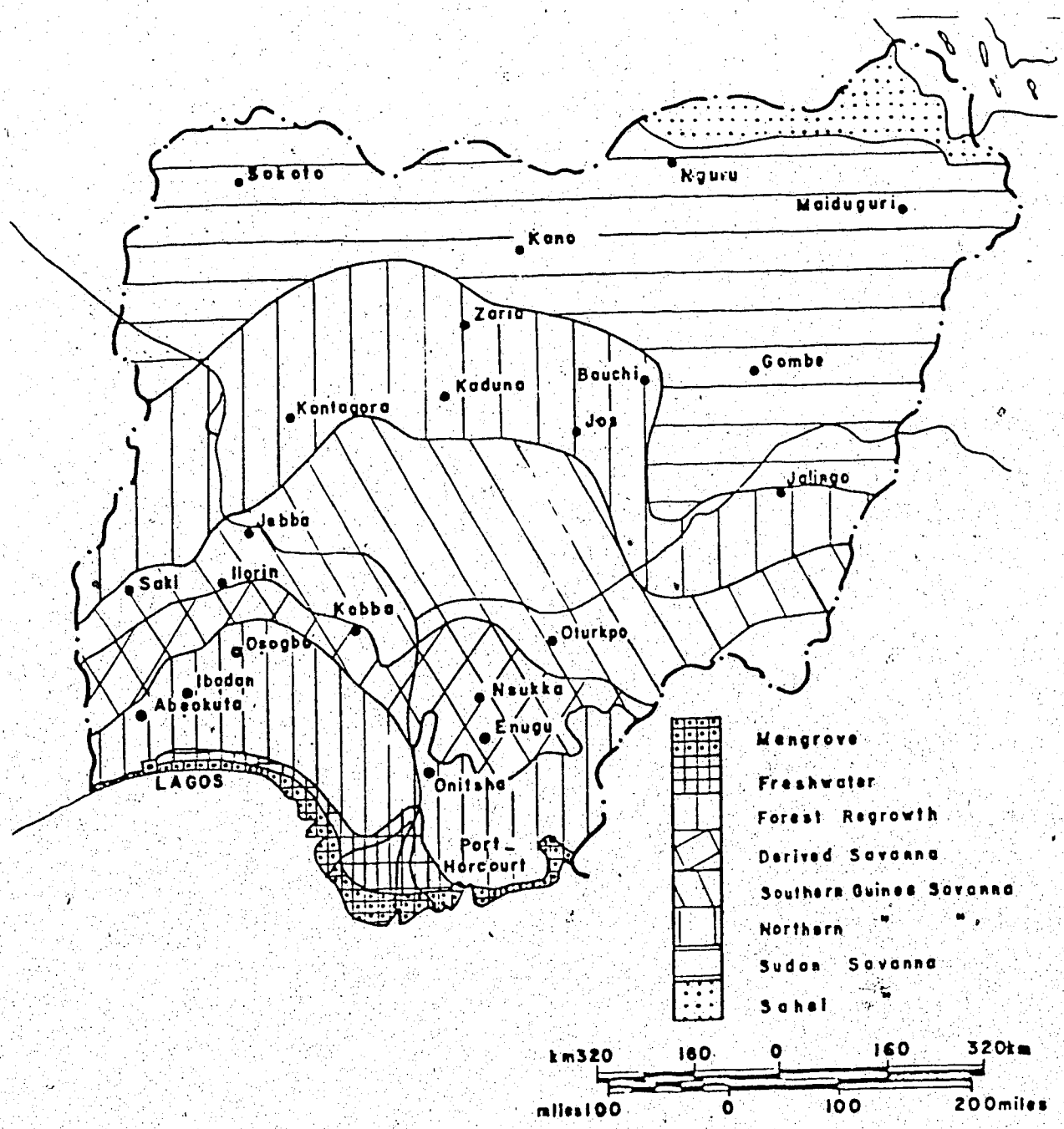
Kano State Vegetation

Most of Kano lies within the Sudan vegetation zone, except parts of its southern border where Guinea vegetation predominates. Figure 5 shows Nigerian vegetation.

The northern border of Kano State lies close to the Sahara which is approximately 840 kilometres (km) from metropolitan Kano. The state is 472.45 metres (m) above

Figure 5

Map Showing Nigerian Vegetation



Source: An Agricultural Atlas of Nigeria by S.A. Agboola, p. 47.

sea level (Kano State Handbook, 1977, p. 18).

There are two large rivers which are located in the southern half of the state. The Hadejia, which is some 328 kilometres (km) long, and Duduru, which is 362.4 kilometres (km) long both of which rise in the Central Plateau of the State and drain northeastward into Lake Chad which is approximately 320 kilometres (km) away. There are no rivers of any significance in the northern part of the State. However, the largest river in the north is River Kano which rises in Riruwai Hills.

Under half of Kano emirate is underlain by granites, schists and gneises of the basement complex. Smooth, rounded inselbergs are found in the southern and western parts of the emirate and are formed of coarse prophysitic granite (Kano State Handbook, 1977, p. 18).

In Gumel emirate, bedded diatoma has been found, which may be used in building low-cost houses. Limestone is said to be present in many localties in Gumel and Hadejia.

The State has arduous climate with relatively wide rapid temperature and humidity fluctuations. The mean daily maximum temperature is 91.6°F (33.1°C) and the minimum being 60.6°F (15.85°C). Humidity sometimes rises to about 100% in an area considered characteristically dry.

As in other parts of Nigeria, Kano State has two main seasons which are the rainy season and the dry season. The dry season lasts from October to May. Temperature ranges between 50°F (10°C) to 90°F (32°C).

Rainfall is concentrated from June to September, which is preceded by violent dust storms followed by tornadoes mainly during the month of May, and at the close of the rains in September and early October. The average annual rainfall is 870.20 millimetres (mm), with about 58% of it in July and August. Rainfall varies considerably from year to year, ranging from 635.00 to 889.00 millimetres (mm) (Kano State Handbook, 1977, p. 19).

The State has a considerable amount of livestock. Statistics that were available for 1976 show that there were 750,000 cattle; 448,000 sheep; 1,600,780 goats; 263,263 donkeys; 85,000 horses; 561 camels; and 2,000,000 poultry (Kano State Handbook, 1977, p. 43; and Kano State Dairy 1977, p. 14).

Principal crops of the State are groundnuts (peanuts), millet, guinea corn, cotton, pepper, maize, cowpeas, rice, wheat, cassava, and a wide variety of vegetables. In 1976, the following tonnes of crops were produced in Kano State:

Crop	Production (tonnes)
Guinea Corn	1,090,200
Millet	905,300
Maize	16,982
Rice	14,300
Cowpea	299,200
Wheat	6,000
Cotton	5,651,000

Source: Kano State Handbook, 1977, p. 35.

Kano State is also endowed with mineral resources, which include tin, columbite and cassiterite.

Kano for centuries was an ancient trade centre with trade links between Nigeria and North Africa.

Today, Kano State is ranked as the second largest commercial and industrial area in Nigeria. There has been rapid development of the industrial sector which is made up of medium and small size industries. At the time of this study, there were 348 such industries with "a combined annual output of over 80 million {about $160 million Canadian dollars}" employed 17,930 people (Kano State Handbook, 1977, p. 51). Some of the products of these industries include furniture, enamelware, cosmetics, mineral waters, metalwork, groundnut products, soap, stationary, etc.

Nigerian Traditional Education

Every society, be it developed, developing or underdeveloped, in Asia, Europe, North America or Africa, has its own way of transmitting its culture from generation to generation in order to sustain and maintain its existence and uniqueness. However, the method used to transmit a culture varies from one country to another. Education plays a decisive and significant role in the transmission of the culture, and the perception of the role and the goals of such education may differ from place to place, nation to nation and people to people. In Old Africa:

> The warrior, the hunter, the nobleman, the man of character or anyone who combined the latter feature with a specific skill was adjudged to be a well-educated and well-integrated citizen of his community. (Fafunwa, 1974, p. 15)

The above concept of an educated man in Africa provided a guide to the curricula practices of education. "Functionalism" was the major guiding principle for the purpose of education of Old Africa. African society regarded education as a means to an end, not an end in itself. Education was generally for the immediate induction of an individual into society and preparation for adulthood. In particular, African education emphasized "social responsibility, job orientation, political participation and spiritual and moral values" (Fafunwa, 1974, p. 15).

African education was usually conducted in an informal way, whereby the parents took the responsibility of training their children in whatever occupation or trade they practiced. "Like father, like son" is an appropriate phrase to apply to traditional African education. For example, if the father was a farmer, the son was trained in farming. If the mother was a weaver, the daughter was taught the art of weaving. The type of training that a child received depended largely on the sex and the vocation of the parents. On the training of youth for an occupation, Ogundijo (1970), cited in Fafunwa (1974), wrote:

> While the boys were receiving vigorous training on the farm under the instruction of their father, the girls were undergoing training at home. Under the strict supervision of their mothers, they were taught {how} to take care of children, prepare food, make clothes, wash {cooking} utensils and take care of the dwelling-place . . . .
>
> Apart from these {domestic} tasks . . . girls had to assist their mothers in their different trades . . . . Girls were also given a code of conduct in preparation for their future role as brides. (p. 34)

The curriculum to be learned was varied and vast, as well as directed more towards practice rather than theory. This type of education has been referred to as "participatory education." Fafunwa explains this type of education in this way:

> Children learnt by doing, that is to say, children and adolescents were engaged in participatory education through ceremonies, rituals, imitation, recitation, and demonstration. They {children} were involved in practical farming, fishing, weaving, cooking, carving, knitting, and so on. Recreational subjects included {amongst others} wrestling, dancing, drumming, acrobatic display, racing, etc.; while intellectual training included the study of local history, legends, the environment (local geography, plants and animals) poetry, reasoning, riddles, proverbs, story telling, etc. (p. 16)

As previously mentioned, Old African education was not segmented into subjects; it was an integrated experience, as "it combined physical training with character building, and manual activity with intellectual training" (Fafunwa, 1974, p. 16).

There was no specific physical structure built to serve as a school in the early days. Education and training were conducted informally as the parents, nephews or nieces were responsible for education and training of the young.

The Coming of Missionaries

The objectives and practices of traditional African education indicated the importance Africans attached to the bringing-up of a "balanced" and "whole" individual, who was to live effectively and efficiently in his or her own environment. The practice of traditional African education contributed significantly for the harmonious and friendly relationship between African groups. Traditional African Education was not for material gains, but a means of integrating the young with the wider spectrum of the society. Then came the Missionaries!

Western education came to Nigeria through the Missionaries and traders, whose sole purpose was to convert the Nigerians into christianity and to trade with them.

The Protuguese were the first Western people to introduce what is termed as "Western education." Lewis (1965) in his book, Society, Schools and Progress in Nigeria, describes the relationship of education to trade when he stated:

> The Portuguese merchants adventurers gave the people of what we now know as Nigeria their first experience of education as practiced in Europe. From the beginning of their trading enterprises overseas in the fifteenth century, education was regarded by the Portuguese as of fundamental importance to the spread of Christianity. (p. 23)

The Portuguese, however, did not have much success in their attempts to educate the Nigerians for two reasons. The first reason was that their trade was limited to scattered

areas of the country. The second reason was the growth of the "transatlantic slave-trade in the sixteenth and seventeen[illegible]ries," which led to the decline of the legitimate tradi[illegible]es and helped to reduce the "educational impact upon t[illegible]ople living in the interior of the country" (Lewis, 1965, p. 23).

Western education made some significant impact upon Nige[illegible]a in the late eighteenth century. The missionaries' "c[illegible]ern" for Christianity and "humanity" coupled with the nee[illegible] to explore and exploit other areas, gave boost to the expa[illegible]sion of Western education in Africa. Western education came to Nigeria through the coastline, that is, through the southern part of the country that neighbours the Atlantic Ocean.

The first formal school was built in Badagry by Rever[illegible] Thomas Freeman in 1842. Freeman moved inland to Abeokuta "to visit immigrants including refugees from slave-raiders. There he started a second mission station also with a small school" (Lewis, 1965, p. 24). In 1846, another mission, a church and a school were built in Abeokuta by the Church Missionary Society (CMS) in which Samuel Ajayi Crowther (a well known Nigerian, who played a significant role in the spread of Western education in Nigeria) was a member.

By 1849 the CMS Yoruba Mission had established "four main stations at Badagry, Lagos, Abeokuta and Ibadan {all in southern Nigeria}. There were five native ordained missionaries, and forty-two trained native teachers working in

sixteen schools," with a total enrolment of "895 pupils" (Lewis, 1965, p. 24). In 1859, a grammar school in Lagos was opened with six children. At Abeokuta a training institution, known as the Theological Seminary, provided instruction in English, Mathematics and New Testament in Greek "for men intended to serve in the ministry of the church. In addition, training was also given in printing and carpentry" (Lewis, 1965, p. 25).

The Missionaries moved inland with the hope of spreading Christianity; however, they met a steep resistance from the people, as Islam was well established in the North. Except for Gbede and Lokoja, there was no Christian missionary station in northern Nigeria before 1900 (Fafunwa, 1974, p. 101). By 1947, there were only three secondary schools and just over 1100 primary schools in northern Nigeria, as compared with 43 secondary schools and nearly 5000 primary schools in the southern provinces (Lewis, 1965, p. 44).

Lewis (1965) summarized the magnitude of Western education in Nigeria in the decade of 1948-58, when he wrote the following:

> At the end of the decade, 1948-58, over 2,500,000 children were attending some 17,000 schools, there were over 25,000 students enrolled in the teacher-training colleges and more than 1800 students pursuing higher education in the Nigerian College of Arts, Science and Technology and the University College Ibadan, and something of the order of 1000 Nigerians were attending colleges and universities overseas. (p. 50)

Other Christian missions that spread both Christianity and education include the Methodists, Baptists, Roman Catholics,

the Church of Scotland Mission, the Qua Ibo of Northern Ireland, the Primitive Methodists Missionary Society and so on (Fafunwa, 1974, pp. 73-91).

According to Fafunwa (1974) the aim of education that the missionaries imparted was:

> The Bible . . . was the master textbook and every subject, no matter how remote, had to be connected in some way with the holy writ. The main purpose of education in the early stages was to teach Christianity with a view to converting all those who came within the four walls of the mission house. (p. 83)

Jones, in the "Report of the Phelps-Stokes Commission, Education in Africa" (1922) pointed some of the major faults of the education that the missionaries provided the Nigerians when he wrote:

> The defects in the educational program, so far as they exist, have usually been due to their {missionaries} conception of education. Some . . . have thought of education as necessary chiefly to understand the spirit of Christianity. . . . the mission have failed to see how their success depends on native welfare, and have therefore been strangely indifferent to the economic value of agriculture, and little concerned with the health and morals of the people. (p. 9)

Even in the early days of Western education in Nigeria, there was a lot of scepticism as to the authenticity of the genuineness of the education provided by missionaries, other than it was the best way to convert people to Christianity.

Fafunwa (1974) very emphatically pointed this out when he said:

> Irrespective of the denominational label, the early Christian schools in Nigeria were conceived by all the Christian denominations as the most important instrument for conversion. Indeed, the school was

> incidental; if Christianity could have been implanted in Nigeria without the use of the school, most missionary groups would have tried to do so. (pp. 90-91)

The content of the curriculum in the mission school, and the control of what was learned was entirely up to the person teaching in any particular mission school. Fafunwa provides an excellent description of the curriculum offered in missionary schools in the following quotation:

> The early school curriculum consisted of Bible reading in the local language, catechism, the story of Jesus, hymns (singing) and prayers, sewing for girls and farming for boys. There was no common curriculum among the missions. Each mission and indeed each school within certain missions followed its own devices, based solely on the teacher in charge. (pp. 87-88)

A passage from Anna Hinderer's Memorials, Seventeen Years in the Yoruba Country, 1873, provides a clearer picture of the learning activities of the early mission schools when she said:

> The first bell rings at half-past eight: from then till a few minutes before nine, when the second bell rings, we can look out and see people coming, . . . some with only the Primer, others more advanced in the art of reading, with various portions of the Word of God; St. Luke, Psalms, Proverbs, and Genesis, being amongst the great favourites . . . . We have about eight or nine classes of different stages; and a very interesting assembly, at the bottom of the church, of those who cannot learn to read. We gather these together, and first tell them a short simple Bible story, and let them tell it us again. . . . Then we teach them a text, or a verse of a hymn, and the last quarter of an hour is always given in all classes to teaching by repetition of some catechism, and sometimes for a change we have the whole school together to go over the creed, the Lords Prayer, and the Ten Commandments, to make sure they are not forgotten. (p. 296)

The effect of Western missionary education on the Nigerian produced a person who overnight became "alien" to his society. The Nigerian was remade into the preconceived image that the missionaries brought with them. Missionary education produced native people who became "political agitators, possessing no roots in nor respect for local traditions, beliefs or environment, out of touch with the mass of the people, . . . ready to create and respond to unrest" (Lewis, 1965, p. 30).

The missionaries taught the Nigerian to adopt but not to adapt, to accept but not to reject or question, to react but not to reflect. The mission boarding schools produced Nigerians who were proud, Nigerians who considered themselves superior to those who remained in the village or town. These missionary Nigerians shun their culture for the white man's. They preferred the music, dress, habits, food, art, etc. of the Western world and not of their indigenous culture.

Fafunwa provided a clear indication of the attitude of the missionaries towards anything African, when he wrote:

> The missionaries themselves, both through their teachings and attitudes, discouraged things African. Consciously or otherwise the missionaries hoped to produce a group of people who were Nigerians only in blood but European in religion, thought and habit. (1974, p. 90)

Nigerian Educational System 1960 to Date

An analysis of the educational system of Kano State will provide some insights and understandings of the Nigerian system of education which varies slightly from state to state. However, the educational philosophy, aims, objectives and structure of this system are similar throughout the nation.

In Nigeria the philosophy, and aims and objectives for the various levels of education are established by the Federal government. The interpretation and implementation of both these facets of education are left to the state governments. The state governments have control over primary and secondary education.

The former military government that ruled the country from 1976 to 1979 in amendment to the 1979 Nigerian Constitution made all forms of post secondary education to be the responsibility of the National Assembly. The December 27th issue of the New Nigerian Newspaper reported these constitutional amendments in this way:

> Part B, Item L - University, technological and post-primary education:
>
> 27. The National Assembly shall have power to make laws for the Federation or any part thereof with respect to university education, technological education or such professional education as may from time to time be designated by the National Assembly.
>
> 28. The power conferred on the National Assembly under paragraph 27 of this item shall include power to establish an institution for the purposes of university, post-primary, technological or professional education.

29. Subject as herein provided a House of Assembly (at State Level) shall have power to make laws for the State with respect to the establishment of an institution for purposes of university, professional or technological education.

30. Nothing in the foregoing paragraphs of this item shall be construed so as to limit the powers of a House of Assembly to make laws for the State with respect to technical, vocational, post-primary, primary or other forms of education, including the establishment of institutions for the pursuit of such education.

(p. III)

The Influence of Western Education on Kano State

As discussed in the previous section, the missionaries came to the interior of Nigeria through the south. Because of this point of entry, Western education was introduced in the southern provinces decades before it was introduced to the northern provinces, which included Kano State.

It is common knowledge in Nigeria that prior to the creation of the twelve states in 1967, Kano Province was considered to be the most backward province of the Federation. This backwardness was not because of negligence, indifference or lack of interest on the part of the people, but the fact was that Islam had been in existence in this state since the eighth century A.D. As Islam spread from North Africa, so did trade and commerce. When the missionaries moved into northern Nigeria, they found Quranic schools and Mosques. Western education was strongly resisted in both the northern part of the country and in Kano State in particular, because at that time the intent of "education" according to Fafunwa was specifically for "Christian" purposes, such as:

> Bible knowledge, Christian ethics, Christian moral instruction, Christian literature, some arithmetic, language and crafts--all geared to produce Christians who could read the Bible. The system also helped to train Christian clerks, Christian artisans, Christian carpenters, Christian farmers, Christian husbands and wives and Christian Nigerians. (Fafunwa, 1974, pp. 71-72)

Additional reasons for the resistance to Western education in northern Nigeria can be attributed to the fear that "a European type of schooling might make the pupils indifferent to the faith of Islam" (Lewis, 1965, p. 29) and the degree of attachment that the majority of the population in this region had for the traditional form of education (Koranic schools).

In September 1975, the then Kano State Military Governor was disturbed by "the relatively poor standard of education and the low percentage of school-going children who actually attended schools in Kano State" (Government View on the Report of Education Committee, June, p. 1). Because of this concern a Review Committee was established and given as its major mandate to "identify the various problems which were hindering the progress of education in the state and to recommend appropriate measures for tackling the problems"(Government views on the Report of Education Committee, June 1976, p. 1).

The Review Committee was chaired by Dr. S.A.S. Galadanci. This committee submitted its final report in January 1976 (which for the purposes of this study will be referred to as the Galadanci Report).

One of the causes for relatively slow educational progress in the state, the Galadanci Report indicates:

> It is common knowledge that western education was introduced in the Federation of Nigeria through western adventurers who came by sea and landed on the southern coast. As a result of this contact, the southern part of the country had an edge, right from the beginning, over the rest of the country especially the far northern part of the country, a position in which Kano finds itself. (1976, p. 4)

Part of the Galadanci Report reiterates what other authorities on Nigerian education have written on the influence that the missionaries have had on the education in the southern part of Nigeria. In part, the Report states:

> Missionaries at first made conversion into Christianity the key factor in the introduction of Western education. . . . Another disadvantage was equating Western education with monetary gain, a factor which can hardly be expected to sell in Kano State. After all, people have abundant evidence to show that you can be rich without going to school --they see thousands of examples every day. (1976, p. 4)

Philosophy of Nigerian Education

The National Policy on Education 1977 outlines the philosophy of education in Nigeria in this way:

> Nigeria'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 of the nation at the primary, secondary and tertiary levels, both inside and outside the formal school system. . . .
> The desire that Nigeria should be a free, just and democratic society, a land full of opportunities for all its citizens, able to generate a great and dynamic economy, and growing into a united, strong and self-reliant nation. . . . (pp. 4-5)

This philosophy for the Nigerian educational system was derived from the overall philosophy and objectives of Nigeria as a Nation. The aims for education were set forth in the Second National Development Plan (1970-1975) and are stated in the "National Policy on Education" 1977. Section 1, sub-section 1 of that policy lists the five main national aims of the country to be:

1. a free and democratic society;
2. a just and egalitarian society;
3. a united, strong and self-reliant nation;
4. a great and dynamic economy; and
5. a land of bright and full opportunity for all citizens. (p. 4)

The national aims of education give support to the philosophy for education in this manner:

1. the inculcation of national consciousness and national unity;
2. the inculcation of the right type of values and attitudes for the survival of the individual and the Nigerian society;
3. the training of the mind in the understanding of the world around; and
4. the acquisition of appropriate skills, abilities and competencies both mental and physical as equipment for the individual to live in and contribute to the development of his society. (National Policy on Education, 1977, p. 4)

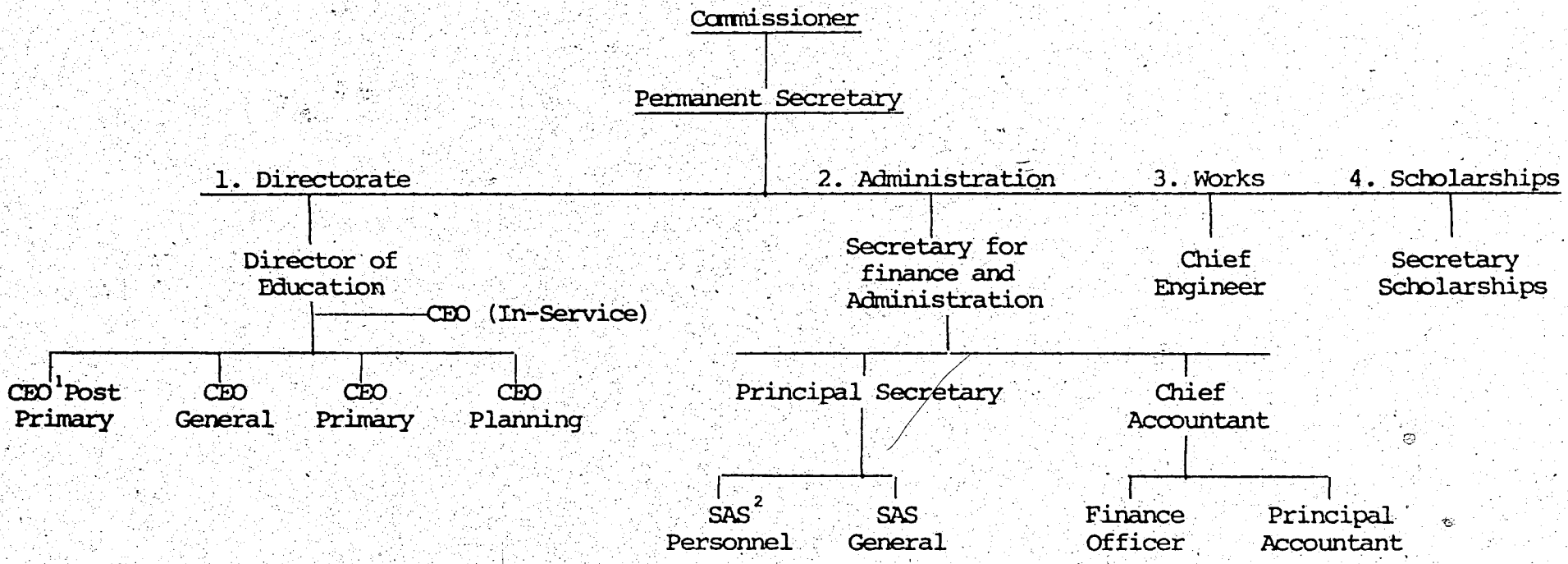
Kano State Educational System

It will be recalled that a previous discussion showed that the Federal Government made the State Governments responsible for both primary and secondary education.

The organization of the State Ministry of Education in Kano State is established in the following chart.

Chart 1

Organizational Chart in the Ministry Headquarters



Key: CEO[1] = Chief Education Officer
SAS[2] = Senior Assistant Secretary

Source: Government Views on the Report of Education, Review Committee, p. 17.

The Kano State Ministry of Education administers the entire educational system with the exception of some post-secondary institutions. Educational policy matters are largely handled by the Ministry of Education which is also responsible for the inspection of schools, administering and grading both entrance and final examinations for schools, certification of teachers and finance. The Ministry of Education has a commissioner (who is appointed by the government in power) with an executive permanent secretary as head.

The Kano State Ministry of Education is organized into the following four divisions: Directorate, Administration, Works, and Scholarships (see Chart 1). Directorate Division is responsible for the professional aspects of education and all aspects of educational planning. The major responsibilities of this division includes supervision and quality control, curriculum development, collection of relevant educational data, storage and retrieval of these data, projection and assessment of physical, materials and manpower needs (Government Views on the Report of Education Review Committee, 1976, p. 18).

The Administration Division is responsible for the operational and financial activities of the Ministry. Duties of this division include: personnel matters of para-education staff; transport and communication facilities; annual budgets and estimates; expenditure control; votes (budget); allocation; returns and reports on items of expenditure; and indenting

unallocated stores and bulk purchases (Government Views on the Report of Education Review Committee, 1976, p. 18).

The Works Division has the responsibility for executing all building and physical programs of the Ministry of Education, as well as general maintenance of all physical facilities.

The Scholarship Division is responsible for awarding scholarships to qualified candidates to study at home or abroad in post-secondary institutions (Government Views on the Report of Education Review Committee, 1976, pp. 18-19).

Education Structure: 1980

The diagram found on page 49 shows the educational structure for Nigeria at the time of this study.

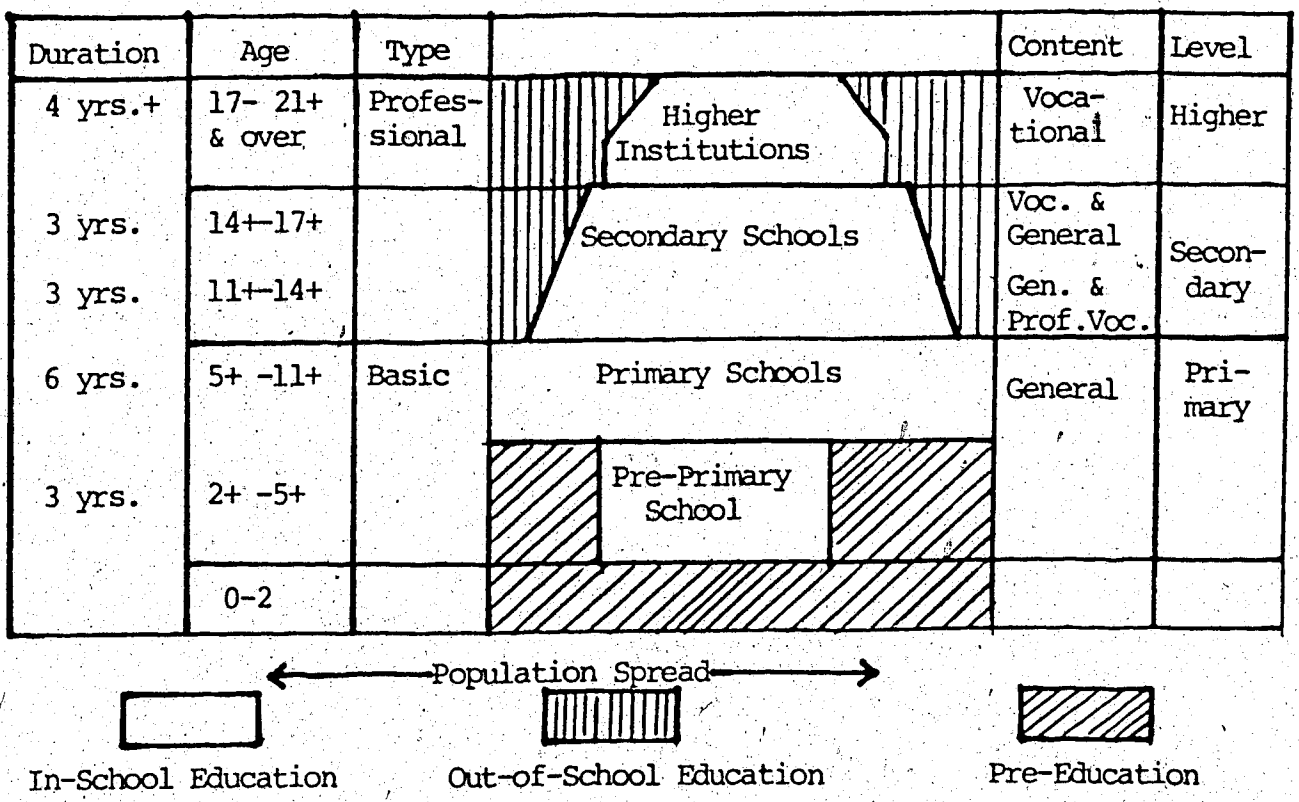
The following is the description of each level of the educational structure of Nigeria in general and Kano State in particular. Since this study is concerned mainly with secondary school education, that section on structure will be discussed in detail, with an overview provided for the rest of the educational levels that make up the system.

The first level of education is pre-primary education, which is education provided to children who are from three to five years of age and is offered prior to their entering primary school.

The basic purpose of pre-primary education is to make the transition from the home to school less painful to the children and cultivate in them an awareness of the society around them (National Policy on Education, 1977, p. 6).

Chart 2

Life Long Education



Source: Federal Republic of Nigeria: National Policy on Education, 1977, p. 1.

The next level of education in the educational structure is primary education, which is given to children who are between five years, six months and 11 years, 6 months of age.

The aims of primary education are basically concerned with literacy and numeracy as well as the awareness of the environment that surrounds the learner.

In order to achieve these aims the Federal Government in its White Paper (1977) prescribes that the learner becomes involved in the study of: science; social norms and values of the local community and country (Nigeria); health and physical

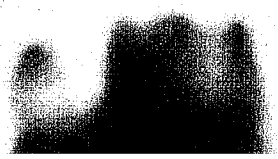
education; moral and religious education; the encouragement of aesthetic, creative and musical activities; crafts, domestic-science and agriculture (p. 7).

In Kano State and, in fact, in the entire country, primary education is free and universal. The Federal Government at the time of the study was moving towards making primary education compulsory.

Articulated with primary education is secondary education, which has these two broad goals: preparation for useful living within the Nigerian society; and preparation for higher or tertiary education.

The National Policy on Education (1977) provides these aims for secondary education:

> a) Provide an increasing number of primary school pupils with the opportunity for education of a higher quality, ...;
> b) diversify its curriculum to cater for the differences in talents, opportunities and roles possessed by or open to students after their secondary school course;
> c) equip students to live effectively in our modern age of science and technology'
> d) develop and project Nigerian culture, art, and languages as well as the world's cultural heritage;
> e) raise a generation of people who can think for themselves, respect the views and feelings of others, respect the dignity of labour, and appreciate those values specified under our broad national aims, and lives as good citizens;
> f) foster Nigerian unity with an emphasis on the common ties that unite us in our diversity;
> g) improve its students with a desire for achievement and self-improvement both at school and in later life. (p. 10)



Secondary education is divided into two levels, with junior secondary school constituting the first level. Senior secondary school forms the second level. Each level is of three-year duration. The former is a school which is for students between the ages of 11 years, 7 months and 14 years, 6 months, while the latter is a school for students whose age range is 14 years, 7 months to 17 years, 6 months.

The following subjects are offered at the junior secondary schools in Kano State. Students are expected to take all of these subjects: Hausa (language), English, Religious knowledge, mathematics, arts and crafts, needlework and dress-making, integrated science, social/cultural studies, human economics, agricultural science, health science and vocational courses (such as machine shop, carpentry, electronics, masonry, etc.).

The senior secondary school is for students who are able and willing to complete a six-year program of secondary education.

Senior secondary schools are classified as follows: grammar, technical, commercial, agricultural or teacher training. The following curricula have been approved for the various senior secondary schools: grammar--this senior secondary school provides the student with the background education to successfully pass the school leaving examinations that will permit the graduate to receive either the West African School Certificate (W.A.S.C.) or the General

Certificate of Education "ordinary" level (G.C.E."O" level). Courses offered in this school include: science and liberal arts subjects. Required courses include handicraft and agricultural science.

Another type of secondary school in Nigeria is the technical secondary school which has these three discrete types of programs: secondary, craftmanship and vocational.

Students enrolled in a technical/secondary school in addition to taking courses in the hard sciences of physics and chemistry must also take courses in woodwork, metalwork and technical drawing. Students who successfully complete this program receive either a W.A.S.C. or a G.C.E."O".

Those students who enroll in a technical craftsmanship school in addition to taking liberal arts courses, English, social sciences, mathematics and language must also take courses associated with the applied sciences. Students who graduate from these schools are granted a City and Guilds Certificate in Civil, Mechanical or Electrical Engineering.

Technical/vocational schools are schools that offer programs in the following occupational areas: motor-mechanics, carpentry, electronics and building construction. Successful candidates will qualify for the Federal Trade Certificate issued by the Federal Government of Nigeria.

The third type of secondary schools are those that are classified as Technical/Commercial Schools. In these schools students study typing, shorthand, bookkeeping,

accounting, in addition to taking courses in English, mathematics, social studies and office routine. Students who successfully complete the program of the school receive either a W.A.S.C. or G.C.E."O" level certificate.

Students who are interested in agriculture may attend a technical/agricultural school where they study mainly theory subjects that will prepare them to enter an agricultural college. Because of the heavy emphasis on theory in these schools, the Galadanci Report (1976) recommended that a "practically oriented" course in agriculture be instituted. At the time of this study there did not exist a vocational agriculture program in any of the secondary schools of Kano State.

The fourth type of school is the teacher training colleges, which normally offer courses for the preparation of teachers. Courses in these colleges are categorized into four groups and can be distinguished as either compulsory or elective courses.

Courses in group one include those that are compulsory for the student and include: English, Hausa, mathematics, education and class teaching. Courses in group two are mandatory and the student must select two from physical and health education, cultural/social studies, and Arabic/French. Those courses that comprise group three include: art, handicraft/needlework and dressmaking, as well as integrated science, from these courses the student selects any two.

From the courses of group four which include home economics and agriculture science, the student selects one subject (Source: Galadanci Report, 1976, pp. 9-10).

Conclusion

At the end of secondary education, a leaving examination that was designed for the West African Examinations Council (W.A.E.C.) is administered to all students. One of the major disadvantages of this procedure is that the educational program of students is designed to meet the requirements of the examination which in turn controls the curriculum. Fafunwa, one of Nigeria's leading educationists, finds this to be less than desirable because of the degree of control that the Council has on education through the school leaving examination. On this very issue he wrote:

> All schools at this level {post-primary} gear their programmes to meet the requirements of examinations administered by the West African Examinations Council. It is an educational truism that examinations control the curriculum and whoever controls a country's examination system controls its education. Regrettably, the success of a secondary school is judged strictly by the performance of its students in the examination set by this council. (1974, p. 193)

Higher education which includes professional education is classified as tertiary education and is given at Universities, Polytechnics and Colleges of Technology; it includes those courses that are given by the Colleges of Education, the Advanced Teacher Training Colleges, as well as the Correspondence Colleges.

At the time of this study, Nigeria had thirteen

Universities which offer full range of programs at the baccalaureate, professional, masters and doctoral levels. Students are admitted to university by one of two routes. The first of these routes is for students who have successfully completed their education at a post-secondary institution. The second route is for students who are admitted to university on a concessional basis. These students must possess a certificate from a secondary school and in addition they must pass the University entrance examinations (which are written and administered by the various Universities).

Technical education in Nigeria is offered in colleges of science and technology or polytechnics, and is considered to be post-secondary education. Kano State College of Technology is a non-university special purpose institution which offers full-time and part-time training programs in a variety of technical fields.

Two of the major objectives of technical education in Nigeria are:

> a) to provide trained manpower in applied science technology and commerce particularly at sub-professional grades; and
> b) to provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development. (National Policy on Education, 1977, p. 10)

Students who successfully complete a program at a polytechnic or a college of science and technology receive either an Ordinary National Diploma (OND) or a Higher National Diploma (HND). The programs offered at these

non-university institutions are normally two years in duration. Students gain admission to a polytechnic by possessing either the West African School Certificate (W.A.S.C.) or the "Ordinary" General Certificate of Education (G.C.E.) of London University.

In 1978, the former military government proposed the two-year programs of the polytechnics and the colleges of science be changed to a four year program with the student spending the fourth year as an industrial intern. The government of 1978 also proposed that there be only one Diploma, the Nigerian National Diploma (NND) instead of two, the OND and the HND. Although both of these proposals were instituted in 1979, these were abolished by the present civilian government which came into office in the same year.

Teacher Education is offered both at the post-primary and post-secondary levels. At the post-primary levels, the institutions are called Teacher Training Colleges (TTCs), while at the post-secondary levels, they are either Advanced Teachers Colleges, Institute of Education Colleges, National Teachers' Institute or Teachers' Centres.

The objectives of teacher education are: to produce highly motivated, conscientious and efficient classroom teachers; encourage the spirit of enquiry and creativity in teachers; identify themselves with the community's aspirations; and to make them adaptable to changing situations (National Policy on Education, 1977, p. 25).

Finance of Education

The financing of education in Nigeria comes from a variety of sources (such as income taxes, cooperate taxes, property taxes and custom and excise duties, as well as natural resources such as oil) that are available to all three levels of government--the Federal Government, the State and the local governments-- because as Fafunwa (1974) said, "the people of Nigeria attach considerable importance to the education of their children" (p. 204).

The Federal Government provides the lion share of money to support education at all three levels--primary, secondary and tertiary. Universities do receive grants from the Federal Government. See Tables 1 to 6 for the Federal Government's grant on education to the states (Appendix G, p. 237).

Agricultural Education in Nigeria

Agricultural Education has been given a separate section because this study is concerned with vocational agriculture at the secondary school level. Because of an increase in population and the amount of food stuffs that must be imported to feed the Nigerian population, both the State and the Federal Government are concerned and are making efforts to increase agricultural production to lessen the need to import foodstuffs.

Agricultural field practices in Nigeria are basically approached in similar ways, but with slight variations from location to location. For instance, the ingenuity of

the African farmer enables him to use various natural phenomena (such as the coming of certain birds at certain times of the year) as guides for farming activities.

Traditional agricultural education in Kano State was through a pseudo-apprenticeship where the father taught his sons how to identify soil suitable for crops and how to plant.

> In subsistence agriculture there was very strict training in the cultivation of the various crops. . . ., children were taught how to discriminate between fertile and non-fertile soil. . . by dipping the cutlass into the soil. (Ogundijo, 1970, cited in Fafunwa, 1974, p. 31)

This informal education of the sons of the farmer does not stop at the identification of suitable soil but also extends to how land is cleared, the methods of farming, understanding of different planting and harvesting seasons, and the methods of testing seeds before planting.

Another important stage in the training of young farmers according to traditional agricultural education was for them to understand the different planting and harvesting season without the use of a calendar. Instead, lunar months were used and still there were ways for the young farmer to know what to plant in each of the seasons.

The initial purpose of farming in early Africa was to produce sufficient food for the family. As time went on, people realized they needed other things besides subsistence food, so cash crops were introduced.

With the introduction of cash crops into the farming

system, the initial purpose of farming was changed. With this change additional responsibilities were added to family members who made a living from farming. Unfortunately, no new innovative techniques were developed to match the progressive expansion of farming. Coupled with the lack of proper techniques were the increase of the Nigerian population; the hostile climate (sometimes draughts, other times floods); and the invasion of the farms by a variety of pests at times helped to reduce agricultural production to a skeleton level where production was not sufficient to feed the Nigerian population.

On the inadequacies of the traditional method of farming, Dugurawa (1979) emphatically stated:

> It has now been realized that the country cannot continue to depend on subsistence farming to feed the ever-increasing population which is characterized by high rate of rural-urban migration.
>
> Able-bodied young men daily abandon the country farm-lands to seek "better living" in the overcrowded and often not well planned towns. (Kano State of Nigeria: Today, January-April, 1979, p. 17)

The Kano State Handbook (1977) pointed to other factors that made agricultural progress in Nigeria slow. These include:

a) {scarcity of land} . . . in terms of labour available--the rapid rise in population means more intensive cropping and the disappearance of the old fallow system which leads to soil exhaustion and erosion;
b) an unfavourable climate which restricts natural cropping to short wet season;
c) a primitive agricultural system--primitive tools allow for farming only small holdings;

d) lack of education, adequate communication and lack of diversified markets and incentives to produce.
(p. 37)

Both the Federal and State Governments i Nigeria are aware and disturbed by the short-fall in agricultural production.

Speaking before a joint session of the Nigerian Senate and the Federal Assembly, on the occasion of the "1980 Budget Statement," reported in West Africa Magazine of March 1980, President Shagari reiterated an earlier concern about the reduction of farm production. In his speech the President pledged that his administration would boost agricultural production when he said:

> I have, on many occasions, reiterated the irrevocable committment of my administration to the goal of self-sufficiency in food production, which is the reason why I approved soon after my assumption of office, the purchase and distribution to farmers of certain essential inputs and equipment including tractors, fishing trawlers, livestock feeds and improved seeds. . . . In the coming fiscal year, we will pursue a number of agricultural programmes in order to achieve the aims and objectives of the green revolution. To this end, a massive campaign will be launched throughout the country {Nigeria} to boost the production of seeds and grains, to be supported by the provision of large quantities of essential inputs, and organized marketing. (p. 560)

On the part of Kano State, the government had taken a number of measures to help in food production. Kano State Handbook reported that:

> In order to maximize {food} production, the State has embarked on a bold policy of eliminating the militating factors against maximum agricultural production such as ignorance of scientific agriculture, lack of capital.

> problem of land tenure, and fragmented holdings, storage, marketing and distribution. . . . One of the measures is by way of encouraging farmers to form co-operative societies in order to attract Government loans. Other farmers are supplied with improved and high-yielding crops, fertilizers, spraying chemicals and insecticides at subsidized prices. (1977, p. 38)

Other measures that the State Government has initiated include the purchase and sale of 50,000 tonnes of fertilizer to farmers at highly subsidized prices. To help farmers purchase additional land and modern farm implements, the Government made available to farmers agricultural loans. The Kano State Ministry of Agriculture and National Resources has constructed about 37 dams in various locations in the state as holding dams for irrigation during the dry season.

All the above Government concern and efforts to boost agricultural production are as laudable as they are desirable, however without organization, planning and the involvement of every segment of the society, the desired result might not be achieved. The modern implements introduced to the farmers call for education and training of those who are to use such implements if technical efficiency is to be raised in both the farming sector and to improve its attractiveness and status as a modern occupation.

Although the Governments have made every effort to boost food production, there was no attempt to incorporate voctional agriculture education at the secondary school level.

If technological innovations proposed by these governments are to be adopted by the farming population, education must be the hand madien of these innovations.

Design of the Curriculum Model

This section deals with establishing a definition for the term "curriculum" as it is defined by leading authorities in the literature on curriculum. Also included are the components that curriculum authorities state should be included in a curriculum such as: philosophical statement; aims, goals and objectives; curriculum content; learning experiences; and evaluation. The work of the major curriculum model builders and the paradigms is a part of the content of this section.

Curriculum Defined

Definitions for the term "curriculum" abound in the literature that has been written by authorities in curriculum. Among authorities in curriculum there is no consensual agreement on the definition for the term curriculum. Derr (1977) charged that "no one of {the various curriculum} definitions has been able to command the support of the bulk of theoreticians and practitioners in the field of curriculum" (p. 145). Zais (1976) concurs with Derr when he wrote that "another indication of the developmental state of curriculum is the lack of precision in the meaning of its basic terminology {curriculum} " (p. 6).

Oliver (1965), Beauchamp (1968), and Bobin (1973)

all agree that unless a clear definition of curriculum is established, any direction taken in curriculum preparation is likely being built on an unstable foundation. Beauchamp (1968) stated his position on this issue when he said:

> The important term for curriculum theory is "curriculum." From a theoretical point of view, it is impossible to develop subordinate points of view, or relationships, with other components of education until ground rules are laid down through meanings ascribed to the basic term "curriculum." (p. 66)

Babin (1973) presented another major concern about the definition for curriculum when he cautioned that "if curriculum is too narrowly defined by educators, their investigation will be restricted; if curriculum is too loosely defined, investigations may be inhibited" (p. 45).

Beauchamp (1968) highlights further the dilemma that curriculum specialists face in defining curriculum when he stated:

> With so many uses and interpretations of curriculum. . . it is easy to imagine the confusion that reigns among subordinate concepts. The problem for organized thinkers in the area is to search out the relationships that need to be established and which will lead to explanatory and predictive generalization. (p. 7)

But Sockett (1976) did not agree with Beauchamp when he countered:

> We must realize that there could be no one answer {for curriculum}, for what we take a curriculum to be will depend on our educational priorities and principles. Every definition of a curriculum will rest on a proposal about education. (p. 22)

Curriculum as a Concept

A review of current definitions of the term curriculum illustrates the problem that is faced by those who are considered to be curriculum theorists such as Bobin and Beauchamp.

Short and Marconit (1968) believed curriculum is a concept of concern for educators, teachers, learners, parents, administrators, and the public. Both of these authors believed that curriculum is a concept with rich and puzzling relationships, which often eludes human understanding (p. 1).

Hammons (1950, p. 7) and Buswell (1942, p. 446) took a slightly different position than those who perceive curriculum as a concept because these writers both agree that curriculum is "course content." Zais (1976) disagrees emphatically with Hammons and Buswell that curriculum is course content, because this writer on curriculum believes that:

> It is extremely simple and, indeed, tends towards the naive. It conceives of curriculum solely as the data or information recorded in guides or textbooks and overlooks many additional elements that need to be provided for in a learning plan. (p. 7)

One of the most prevalent concepts that is adhered to by curriculum specialists is the definition they give curriculum as planned learning experiences. The proponents of this definition include curriculum theorists as Smith, Stanley and Shores (1957, p. 3), Krug (1957, p. 3), Doll

(1968, p. 15) and Saylor and Alexander (1966, p. 5).

Ragan (1966) and Wagner (1958) have a more generic definition for the term curriculum to include whatever a child learns under the guidance and direction of the school. However, Johnson (1967), Beauchamp (1968) and Taba (1962) took issue with this narrow definition of curriculum as learning experience. Johnson, in his writing, took the position that if this definition is accepted, it would be difficult to distinguish a curriculum from instruction. On this issue he wrote:

> Accepted usage identifies curriculum with "planned learning experiences." This definition is unsatisfactory, however, if "curriculum" is to be distinguished from "instruction" . . . there is no experience until an interaction between the individual and his environment actually occurs. Clearly, such interaction characterizes *instruction*, not curriculum. (p. 44)

Johnson does accept the fact that curriculum should be a guide to instruction, and should be viewed as anticipatory, not reportorial. To him curriculum implies intent and he defines curriculum as "structured series of intended learning outcomes" (p. 44).

Zais (1976) gave support to the efforts of Johnson to separate curriculum from instruction as an "attractive and carry impressive logical force" (p. 9); but to do so would have theoretical as well as practical difficulties. He concluded that either Johnson's definition of curriculum is too narrow or curriculum planners should change their titles to "curriculum and instruction planners" (p. 10).

To emphasize "experience" or "learning experience"

in the definition of a curriculum, is to redefine learning. According to Beauchamp (1968):

> The key phrase in almost all definitions of curriculum is "experience" or "learning experience", and in most cases the definition of curriculum, under close scrutiny, reduces itself to a redefinition of learning. Learning is something a pupil does. Only the learner can have a learning experience. (pp. 80-81)

One of the tasks of a curriculum planner is to provide the environment in which the learner may have a learning experience.

Taba (1962) highlighted the problems of those who attempt to separate curriculum from instruction when she wrote:

> Excluding from the definition of curriculum everything except the statement of objectives and content outlines and relegating anything that has to do with learning and learning experiences to "method" might be too confining to be adequate for a modern curriculum. (p. 9)

Zais (1976) believes that a curriculum "can refer either to a written plan for instruction or to the functioning curriculum that operates to guide and govern the environment and activities of live classroom situations" (p. 11).

In an article "Curriculum: A Concept Elucidation" in Curriculum Inquiry, Derr (1977) gave the following definition for the term curriculum, "a set of things which are taught, and designated for learning, and given to pupils to be learned by them" (p. 152).

From the above discussion, it is evident that there are as many definitions for the term "curriculum"

as there are writers on this subject. Although there are a wide number of definitions in the literature, the definitions are different only in degree and not in content. The researcher accepted Derr's (1977) definition as the definition for the term curriculum which is used in the report.

Sources of Curriculum

Curriculum sources often are referred to in the literature as the foundations or the determinants of the curriculum. These foundations of the curriculum are "those basic forces that influence and shape the content and organization of the curriculum" (Zais, 1976, p. 15).

These basic sources according to curriculum theorists are the society, the learner, the discipline of knowledge and the learning theories. Schwab (1969), Taba (1962), Zais (1976), and Lawton (1978) all agree that any curriculum based on any one of the sources is "incomplete," "doctrinaire," "limited in usefulness" and cannot on its own be justified. Schwab (1969) points out the danger of basing curriculum on only one of these sources:

> A curriculum based on theory about individual personality, which thrusts society, its demands and its structures, far into the background or ignores them entirely, can be nothing but incomplete and doctrinaire, for the individuals in question are in fact members of a society and must meet its demands to some minimum degree since their existence and prosperity as indiyiduals depend on the functioning of their society. In the same way, a curriculum grounded only in a view of social need or social change must be equally doctrinaire and incomplete for societies

> do not exist only for their own sakes but for the prosperity of their members as individuals as well. (p. 86)

Lawton (1978) states:

> None of these three 'theories' {child-centred, knowledge-centered, and society-centered} can on its own be a complete justification for a curriculum, we find ourselves in a very difficult situation. (p. 2)

Taba (1962) charged that the emphasis on a single basis, has provided an unnecessary versus thinking, but this should be combined into one comprehensive curriculum theory (p. 9).

Beauchamp (1975), Smith, Stanley and Shores (1957) and Johnson (1967) place heavy emphasis on the culture as a source of curriculum. Smith, Stanley and Shore (1957) state:

> The curriculum of the school in any society, {includes} . . . a set of educational objectives, a body of subject matter, a list of exercises or activities to be performed and a way of determining whether or not the objectives have been reached by the students . . . . These things comprising the curriculum are always, in every society, derived from the culture. (p. 8)

Johnson (1967) believes that the only possible source of curriculum is the total available culture (p. 45).

In an article, Curriculum Sources, Wilhelms (1962) believes that the body of knowledge makes it easier for the new learner to cover in hours the fruits of a life time's work, and with little or no guidance the young learner can genuinely discover for himself what only a Newton could discover the first time (p. 65).

The disciplines or bodies of knowledge are important to curriculum development, according to Wilhelms (1962) as these bodies of knowledge stimulate thought and feeling and allows us to view our universe from different mountain-peaks or perspectives. He pointed out that "each {of the domains of knowledge} offers high fulfilment to certain men and women with some special set of abilities and interests" (Wilhelms, 1962, p. 65).

From the brief analysis of sources of curriculum, it is clear that there are at least three foundations or determinants for a curriculum. These are: the learner, the society or culture in which the learner resides, and the disciplines or bodies of knowledge found in that society.

Curriculum Components

Tyler (1949), Smith *et al.* (1957), Taba (1962), Beauchamp (1975), and Zais (1976) all agree what the elements are that constitute a curriculum. According to these authorities, the elements or components of a curriculum are: a philosophical statement; aims, goals and objectives, which give direction to the philosophical statement); curriculum content (which must be taught to a learner if the goals are to be achieved); learning experiences (interaction between learner and environment); and evaluation (a means to determine if teaching and learning were effective).

There is universal agreement among curriculum theorists on the function that a philosophical statement has

in designing a curriculum. The functions of such a statement is to give direction to both the society and educational system of the society. Authorities such as Silvius and Bohn (1961), Tyler (1949), and Zais (1976) support this point of view. According to Silvius and Bohn (1961), a philosophical statement in a curriculum "serves as a guide post for the development of the entire instructional program and basically serves as the first step in the development of a functional program of instruction" (p. 12).

Tyler (1949), writing on the use of philosophy to select educational objectives, wrote:

> An adequate formulation of an educational and social philosophy will include the answers to several important questions. In essence the statement of philosophy attempts to define the nature of a good society. One section of an educational philosophy would outline the values that are deemed essential to a satisfying and effective life. (p. 34)

In relation to Nigerian Education, the Federal Government has adopted education as an instrument for effecting national development. Addressing the issue of the philosophy of Nigerian Education, the National Policy on Education (1977) had this to say:

> Nigeria'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 of the nation at the primary, secondary and tertiary levels, both inside and outside the formal school system. (p. 4)

From the above discussion, it is evident that authorities on curriculum consider the development of a philosophical statement to be relevant to the design of an

educational program. A philosophical statement gives purpose and direction to the educational system of a society.

Aims, Goals and Objectives

From a thorough review of the literature on curriculum construction or development it is evident that terms such as aims, goals and objectives are often used as synonyms and it is difficult to show a sharp line of demarcation because the way that authors use these terms interchangeably.

Taba (1962) in her classic textbook on curriculum, Curriculum Development: Theory and Practice, opens her discussion on the objectives of education in this way:

> An educational program, like any activity, is directed by the expectations of certain outcomes. The chief activity of education is to change individuals in some way: to add to the knowledge they possess, to enable them to perform skills which otherwise they would not perform, to develop certain understandings, insights, and appreciations. The statements of these expected or desired outcomes are usually called either educational aims or educational objectives. (p. 194)

In order to clarify the confusion that exists on the difference between these terms "aims," "goals" and "objectives," Zais is one author who attempted to show a hierarchy for these terms by showing that a relationship exists between each term. This writer explains that curriculum aims are statements that describe expected life outcomes, which is based on a value schema and borrowed from philosophy. Curriculum goals refer to school outcomes, and may reflect goals of a school system. Curriculum objectives

are more proximate to the learner, as they indicate specific outcomes for classroom instruction (1976, p. 306).

Silvius and Bohn (1961, p. 95) agree with Zais because these two authors believe that the more abstract the statement of intent (philosophical statement), the closer are the aims to the philosophical statement. The more specific and proximate to the learner of the statement of intent, the closer it comes to instructional objectives. This position is also ascribed to by Taba (1962). If aims are stated on general levels to provide orientation to the main emphasis in educational programs, they might be described as "a philosophy of education." But when aims are stated to indicate an individual acquiring certain knowledge, skills, and attitudes, "this more specific levels are usually referred to as educational objectives" (p. 196).

Aims, goals and objectives give direction and guide to what the curriculum should cover, what to emphasize, content to select and which learning experiences to stress and what to evaluate.

As there are various sources of curriculum, there are also various sources for the aims, goals and objectives of that curriculum. Some curriculum specialists believe objectives eminate from the culture, while others identify the learner and the disciplines of knowledge as other sources of educational objectives. The proponents of culture as the source of educational objectives include Smith, Stanley and Shores (1957), Johnson (1967) and Beauchamp

(1968). Smith *et al*. (1957) state:

> The objectives of education are derived from the culture. Since the culture consists of the ideals, ideas, methods of thinking, skills, attitudes, institutions and other man-made aspects of environment whatever ends the school attempts to achieve will be ends recognized as desirable in the cultural systems to which the school belongs. (p. 107)

The opponents of using the culture as the only source of educational objectives include Tyler (1949), Taba (1962) and Zais (1976). These three curriculum theorists recognize that the society, the learner, and the disciplines of knowledge all have significant importance for educational objectives. On this issue Tyler (1949) wrote:

> The point of view taken in this course is that no single source of information is adequate to provide a basis for wise and comprehensive decisions about the objectives of the school. Each of these sources should be given some consideration in planning any comprehensive curriculum program. (p. 5)

Taba (1962) identifies some of the sources of educational objectives when she stated:

> {There are} . . . several sources from which ideas for educational aims and objectives are and should be derived. One of these is the analysis of the particular culture and society which the educational program serves. . . . It is equally important to consider what is known about individuals as persons and their needs for self-development and self-fulfilment. . . . Finally, it is necessary to study the subjects which compose the school programs in order to decide which intellectual skills and understandings are appropriate to each. (pp. 194-195)

It is clear from the above analysis that the terms "aims," "goals" and "objectives" are used as synonyms by curriculum practitioners. These curriculum authorities all

concur on the importance of the terms to direct school systems and programs. Content selection, organization and sequencing, selection of learning experiences and teaching methods, as well as criteria for evaluation are based on the aims, goals and objectives of programs.

Curriculum Content

In order to effectively achieve the educational aims, goals and objectives of a curriculum as well as effectively transmit the most important and desirable knowledge, the selection and organization of content is most important.

In the writings of curriculum theorists, many of them use content and subject-matter interchangeably. Saylor and Alexander (1966) defined curriculum content as:

> Those facts, observations, data, perception, discernments, sensibilities, designs, and solutions drawn from what the minds of men have comprehended from experience and those constructs of the mind that reorganize and rearrange these products of experience into love, ideas, concepts, generalizations, principles, plans and solutions. (p. 160)

Hyman (1973) defines content as "knowledge, skills and processes, and values" (p. 4). Zais (1976) accepts the definition of content given by Saylor and Alexander except that Zais defines content in briefer terms as "information, ideas, concepts, generalizations, principles and the like" (p. 324).

Two terms that have a definite interrelationship with content are selection and sequence. Zais (1979), Smith

et al. (1957) and Taba (1962) are of the opinion that the primary basis for selecting any curriculum content are the aims, goals and objectives that have been established for that curriculum. In selecting this content, there is need to establish criteria. Taba (1962) stated when criteria are established assurance is provided so that temporary needs and feelings of urgency will not overwhelm other basic functions of education (p. 265). To develop criteria for selecting content, Smith *et al*. (1957) advise that objectives that are established in terms of expected behaviours should be the bottom line. However, these authorities caution on using only objectives to select content because, first, objectives are seldom chosen as carefully or stated as clearly as this method requires and secondly, educational measurement is in its infancy where instruments are not yet adequately developed to assess a large number of objectives. Another important point to consider is that the curriculum consists of two different things: the content and the learning experience.

Curriculum theorists agree on criteria for selecting content. Significance, utility, interest, and human development are the criteria that Zais (1976, p. 343) has identified for selecting content. Johnson (1968, pp. 74-75) suggests that the criteria for content selection include: significance, relevancy, interest and democratic value orientation. Taba (1962, pp. 267-284) proposes the following criteria for selecting curriculum content: validity and

significance, usefulness, balance of breadth and depth, provision for achievement of a broad range of objectives, learnability and adaptability, as well as appropriateness to the needs and interests of the learner.

Zais (1976) defines sequence "as the order in which curriculum content is presented" (p. 340). Taba (1962) viewed sequence as putting the content and materials into some sort of order of succession (p. 292).

Some authors often refer to sequence as the "vertical" organization of content, to distinguish it from "horizontal" organization, which is the arrangement of content at a given level of organization.

There is no fixed criteria for determining the sequence of content; this depends on the disposition and assumption in the foundational areas of the person developing the curriculum. One curriculum designer might lean toward the structure of subject matter, while another might lean towards the psychological theories that govern human learning.

In their book, Fundamentals of Curriculum Development, Smith, Stanley, and Shores (1957) have identified four principles that underly the sequencing of content. These are: simple to complex; prerequisite learnings, whole to part; and chronology.(p. 233).

Bruner (1967) writes that there are a variety of factors which will help to determine a variety of content sequences for learners when he stated:

> There are usually various sequences that are equivalent in their ease and difficulty for learners. There is no unique sequence for all learners, and the optimum in any particular case will depend upon the variety of factors, including past learning, stage of development, nature of the material, and individual differences. (p. 49)

Learning Experiences

According to leading curriculum practitioners, such as Tyler (1949), Taba (1962) and Zais (1979) all agree that curriculum content and learning experiences are two distinct curriculum components. Tyler (1949, p. 63) believes that learning experience refers to the interaction between the learner and the external conditions in the environment to which he reacts. Learning experiences are the mental operations that students employ in learning content (Taba, 1962, p. 265). These are important for the effective implementation of the curriculum. Zais (1976) stated:

> Good intentions, fine goals and objectives, excellent content, flawless evaluation procedures, . . . are all for naught if the learning activities in which students engage do not provide them with experience whose consequences are educational. (p. 350)

Various curriculum practitioners stress the importance of both curriculum content and learning experiences to achieve the desired goals. If curriculum is a plan for learning, and if the objectives determine important learning content, according to Taba (1962), then it follows that "adequate curriculum planning involves selecting and organizing both the content and learning experiences" (p. 266).

The primary standard to judge the merit of curriculum learning activities is through the curriculum aims, goals and objectives. This is supported by Tyler (1949), Beauchamp (1975), Zais (1976), Smith *et al.* (1957) and Taba (1962).

It is clear from the above analysis of learning experiences that well stated philosophical statement, aims, goals and objectives, as well as well selected and organized content, all are for naught if the learning experiences are not appropriate to the age level of the student.

Evaluation

Not much attention has been given to evaluation of curriculum, and this prompted Zais (1976) to comment:

> In most curriculum books that deal with the topic {evaluation}, it is almost always treated exclusively in terms of the evaluation of student achievement, often in connection with assigning "grades" or "marks." Even in a comprehensive text, which accords curriculum evaluation far broader scope than most treatments of curriculum, the focus of evaluation is principally on "the degree to which pupils attain. . . objectives." (p. 369)

Evaluation is an essential component of curriculum, as it will help indicate the effectiveness and worthwhileness or otherwise of the entire curriculum. There is a controversy among curriculum specialists as to the definition of evaluation. Some define it in a broad sense to include all that the school provides, while others define evaluation as applied to what the student learns. This is a "narrow" definition of the term evaluation.

Tyler (1949) emphasized the importance of evaluation in developing a curriculum when he said:

> It is important to make a more inclusive check as to whether these plans {curriculums} for learning experiences actually function to guide the teacher in producing the sort of outcomes desired. This is the purpose for evaluation, and the reason why a process of evaluation is necessary after the plans themselves are developed. (p. 105)

Cronbach (1963) identified three uses of evaluation: course-improvement decisions, decisions about individual students, and administrative regulation. In Taba's (1962) point of view, the most central and often neglected function of evaluation is the validation of hypotheses on which the curriculum is based. In addition to this central function, the development of curriculum, provision of information on weaknesses and strengths of the program, and an evidence which can be used for more adequate marking, grading and reporting were identified by Taba as other functions of evaluation (pp. 313-316).

Beauchamp (1968, p. 37) identifies four dimensions of curriculum evaluation:

1. Evaluation of teacher use of the curriculum;
2. Evaluation of curriculum design;
3. Evaluation of pupil outcomes; and
4. Evaluation of the curriculum system.

Smith *et al.* (1957), Zais (1976), Taba (1962), Beauchamp (1968) and Tyler (L957) identified the aims, goals and objectives of the curriculum as the basic criterion for evaluation.

Taba (1962) outlined these six items as criteria for evaluation of a program: consistency with objectives,

comprehensiveness; sufficient diagnostic value; validity; unity of evaluative judgement and continuity.

There are mainly two different types of evaluation, namely, summative evaluation and formative evaluation. The principal differences between the two are in purposes, time and level of generalization.

Summative evaluation is conducted at the completion of the curriculum development process, and it provides "a terminal judgement on the completed product in overall, general terms" (Zais, p. 381). Formative evaluation is an on-going activity during the curriculum development process for "additional . . . data that can be used to 'form' a better finished product" (Zais, 1976, p. 381).

Much emphasis is given to product evaluation which asserts the achievement of the student, rather than a comprehensive one that will evaluate both the student and the curriculum. Zais (1976) advises that while the evaluation of student achievement is important, however, "it by no means approaches what may generally be conceived of as comprehensive curriculum evaluation" (p. 369). The implication of this is that evaluation should be conducted for both the learner and the curriculum, periodically [redacted] terminally.

Curriculum Model

From the preceeding discussions the components of a curriculum were identified to be; the philosophical statement; aims, goals and objectives; curriculum content;

learning experiences; and evaluation. The following analysis will show how curriculum theorists relate these components to one another to develop a curriculum model. This can be done through curriculum theory, the importance of which was outlined by Beauchamp (1961) in his book, Curriculum Theory. He stated:

> Several characteristics of the curriculum itself . . . {are} significant for deliberation about curriculum theory. One of these was the definition of the concept "curriculum." Another was the stating and organizing of objectives . . . third . . . was the curriculum content and its organization. . . {as well as} the question of curriculum design. These areas are all problematic for curriculum theory, and they are recognizable as dimensions of theoretical work. (p. 114)

The literature on curriculum development indicates that curriculum theory is non-existent as theories are believed to be developed in the behavioural sciences. However, Taba (1962) argues that there is urgent need for curriculum theory to take care of the problems Beauchamp alluded to. Writes Taba:

> A theory of curriculum development is needed. . . not only {to} define the problems with which curriculum development must deal, but also {to} elaborate the system of concepts which must be used to assess the relevance of these data to education. (p. 6)

It is evident from Taba that curriculum theorists find themselves in a dilemma when they attempt to develop a universal curriculum theory that is objective as well as effective.

Beauchamp (1975, pp. 3-6) is one theorist who believes that all curriculum theories are derived from three broad categories of knowledge which are found in: (a) the

humanities; (b) the natural sciences; and (c) the social sciences.

There is no one standard and acceptable definition of curriculum theory. If the concept of curriculum is to be clearly understood, Taba (1962), Tyler (1967) and Zais (1976) elucidate that a clear definition of the term "curriculum theory" should be provided. Taba (1962) defined curriculum theory in this way:

> A way of organizing thinking about all matters that are important to curriculum development: what the curriculum consists of, what its important elements are, how these are chosen and organized, what the sources of curriculum decisions are, and how the information and criteria from these sources are translated into curriculum decisions. (p. 420)

After an extensive review of the current definitions of curriculum theory, Beauchamp (1975) settled with the following definition:

> A curriculum theory is a set of related statements that gives meaning to a school's curriculum by pointing up the relationships among its elements and by directing its development, its use, and its evaluation. (p. 58)

Zais (1976) defined curriculum theory in terms of a set of logically interrelated definitions, concepts, propositions and other constructs that represent a systematic view of curricular phenomena (p. 87). He ascribes to the function of curriculum theory as a way of describing and explaining curricular phenomena and serves as "a policy for the guidance of curriculum activities" (p. 87).

A term which is related with curriculum theory is curriculum model. Some curriculum theorists treat

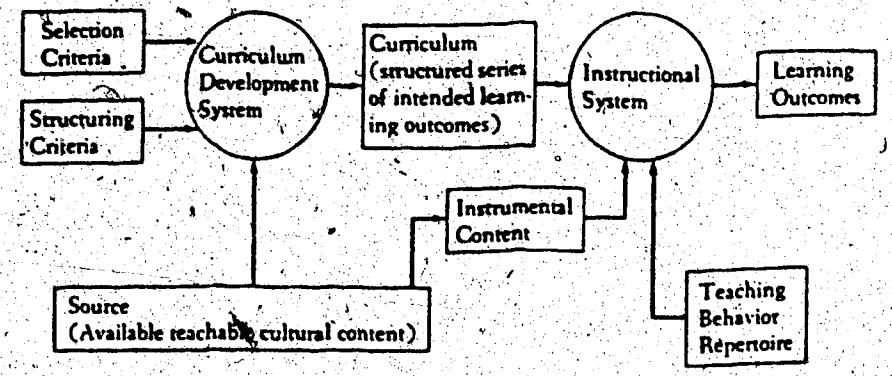
curriculum model as curriculum theory. A model, for example of a house, a bridge or a curriculum, is a true representation of the actual phenomena, however it is not that phenomena the model represents. Model acts or functions as a guide. O'Connor (1957) observes that models in "science act like metaphors in language; they enlighten us by suggesting arguments by analogy from known resemblances to resemblances so far unnoticed" (p. 90). Zais (1976), in his book, Curriculum: Principles and Foundations, defined models in a general term as miniature representations that summarize data and/or phenomena and thus act as an aid to comprehension (p. 91). Rivett (1972) implied a basic purpose for developing models, when he defined a model in this way: "a set of logical relationships, either qualitative or quantitative, which will link together the relevant features of reality with which we are concerned" (p. 9). Thus conceived, the model is a device to help the theorist identify his events and to show the relationships among them.

Figures 6-9 are a sample of curriculum models as designed by curriculum theorists to show how the various components of a curriculum interrelate.

Johnson's Curriculum Model (Figure 6) shows the curriculum as the out-put of the curriculum development system. The curriculum developed from this system, which consists of instructional content to be taught and the behaviour of the teacher, the one teaching the content. From a further analysis of the Johnson Model it can be

Figure 6

Johnson's Model



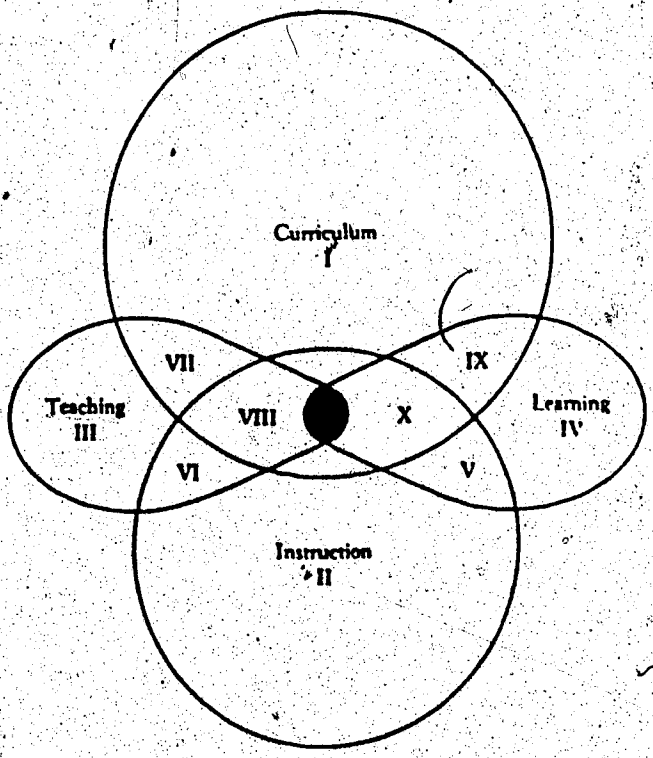
Source: Johnson, M., "Definitions and Models in Curriculum Theory," Educational Theory, April 1967, p. 46.

shown that the instructional delivery system has the following three components: planning, execution (instruction) and evaluation.

Macdonald designed a Curriculum Model (Figure 7) which shows the interrelatedness of the curriculum with teaching, instruction, and learning as the other components of the model. In Macdonald's (1965) Model, the small dark spot represents the point of congruence where curriculum goals are operating in the instructional setting through the agency of effecting teaching activity, which is evident by the change in behaviour of the student. Macdonald describes space V of the model as concomittant learning; space VI as the improvement of teacher behaviour; space VII is described as teacher in-service experiences; and space VII might include supervision experiences. In describing spaces IX and X, Macdonald (1965) wrote: "although few

Figure 7

Macdonald's Model



Source: Macdonald, J.B., "Educational Models for instruction," in Macdonald, J.B. and Leeper, R.R. (eds.), Theories of Instruction, 1965.

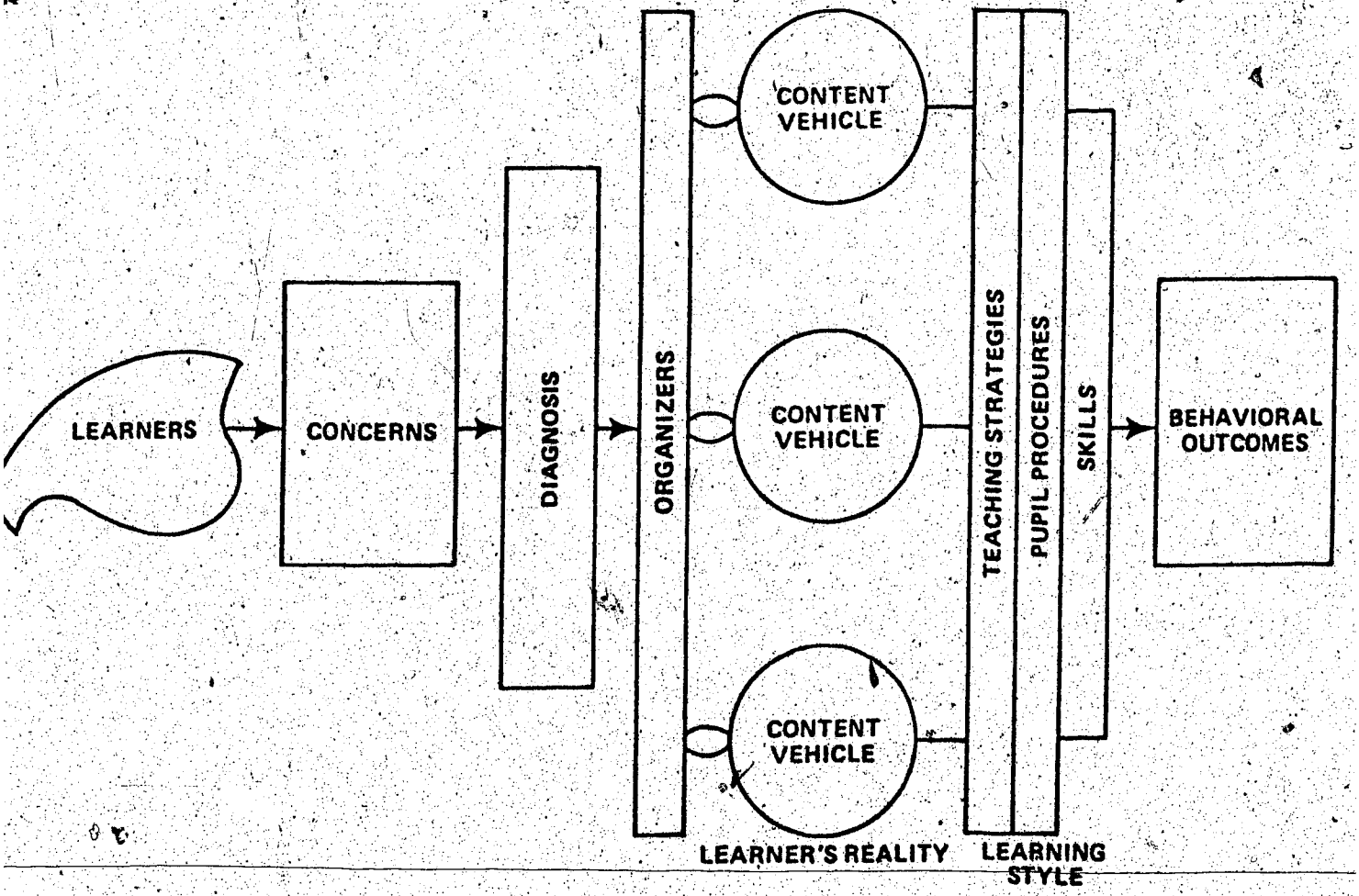
ready examples come to mind, spaces IX and X might deal with pupil-teacher planning experiences" (p. 5).

Although Macdonald's Model does help to clarify the interrelationship of teaching, learning, instruction, and curriculum, it does not clearly show how spaces IX and X are related to the scope of the curriculum.

Weinstein's Curriculum Model (Figure 8) is learner based, on knowledge which can be found in the disciplines of psychology, anthropology, as well as the economy. The concerns that the learner brings to school should be diagnosed

Figure 8

Weinstein's Model



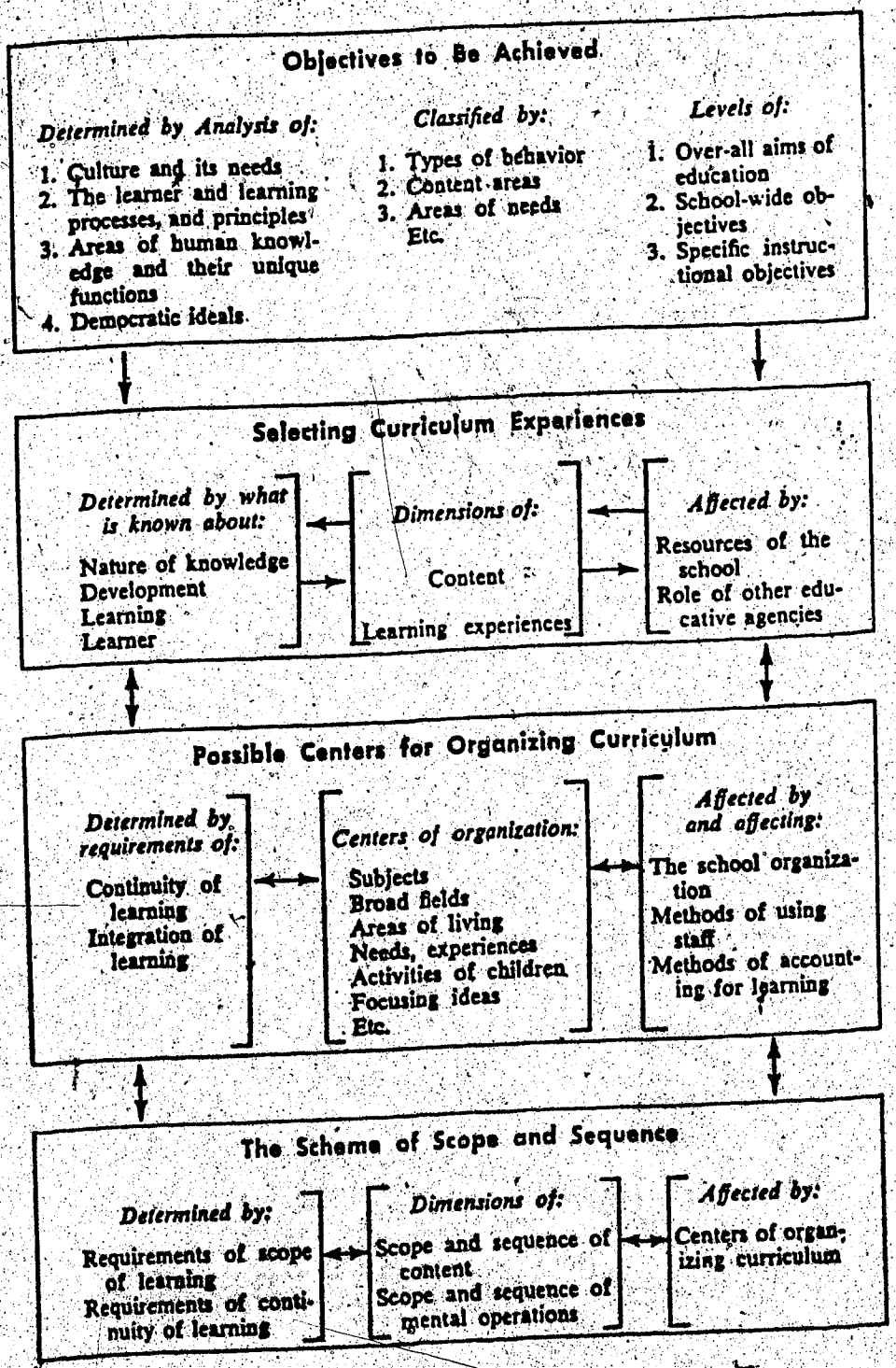
Source: Julian Roberts, "Communicating Curriculum: An Analysis of Current Texts," in A Search for Valid Content for Curriculum Courses, 1970, p. 85.

in terms of that which will affect curriculum, both in content and in design. The content vehicle of this particular model includes: self-concept, connectedness, and power which are associated with the learner's reality.

Taba's Model for curriculum design (Figure 9) includes the identification of the objectives to be achieved

Figure 9

Taba's Model



Source: Taba, Hilda, Curriculum Development: Theory and Practice, 1962, p. 438.

from an analysis of the culture; the learner and the discipline of knowledge. Once these objectives are identified they are used to select curriculum experiences that the learner may be involved with. The determiners, dimensions and affecting factors that influence this phase of the curriculum design are interactive with one another. According to Taba's Model, curriculum content is organized by the requirements of the continuity and integration of learning, which is related to the different centeres of organization. There is an interaction internal to and external to this phase, and the last phase of the model which include content selection, scope and sequence.

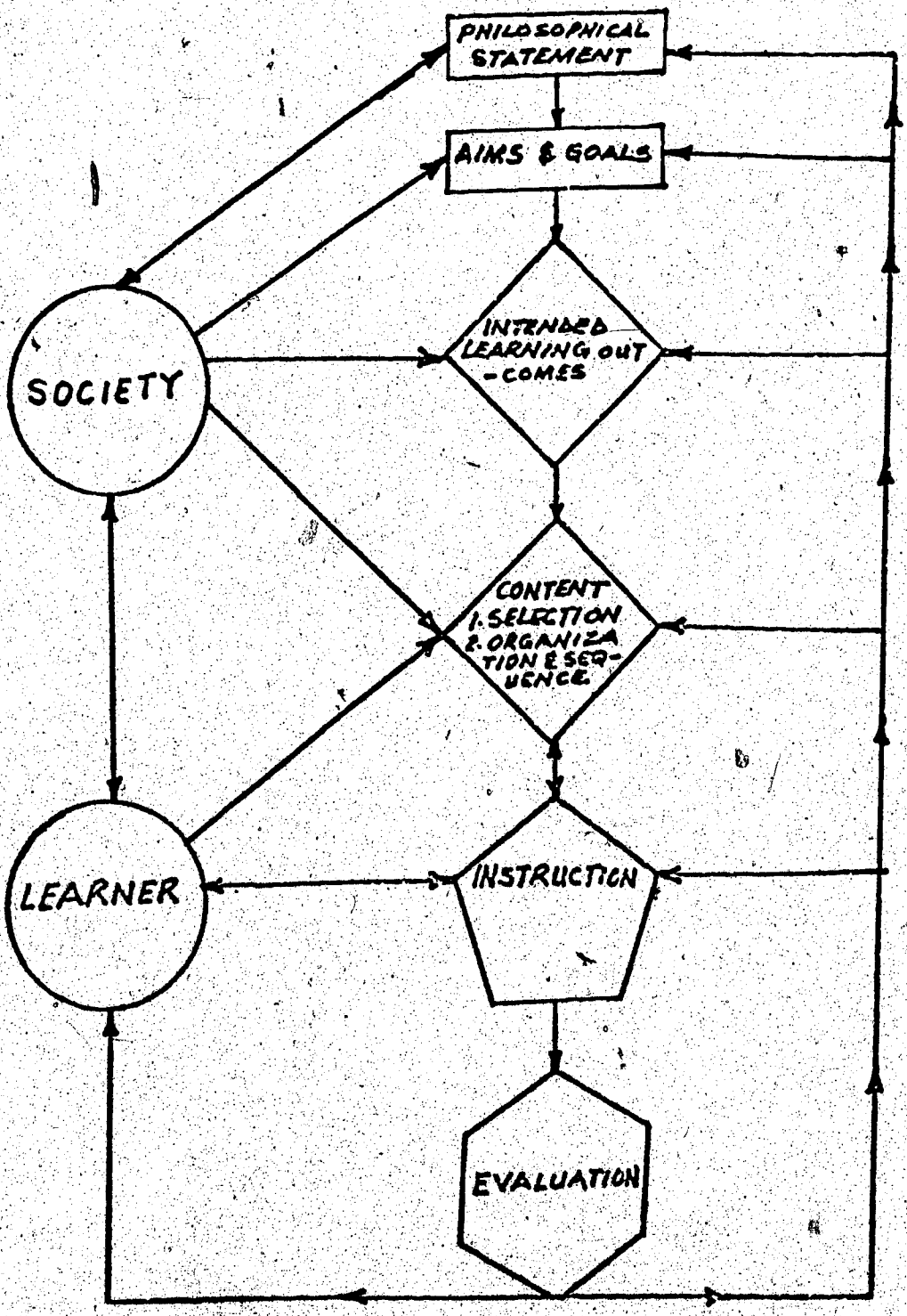
From a review of these curriculum models the following curriculum model (Figure 10) was developed for this study. This model is designed on a conceptional framework that was acquired from a review of curriculum development.

In this model, the philosophical statement is to be derived from two major sources--the society and the learner--because these two sources are in a constant interaction with each other. The disciplines of philosophy, sociology, anthropology, psychology, etc. are used to help diagnose the interests and the needs of both the society and the learner. A double barbed arrow serves to link the philosophical statement with the society, because the philosophical statement gives direction to the mores and values of a society.

The aims and goals of education are derived from the

Figure 10

Curriculum Model for this Study



philosophical statement. In the model the two components are linked by an arrow to the source of the aims and the goals of education.

Although aims and goals are very broad statements of educational intent, such as, "the acquisition of appropriate skills, abilities and competencies both mental and physical as equipment for the individual to live in and contribute to the development of his society" (National Policy on Education 1977, p. 4), they give direction to the intended learning outcomes.

Learning outcomes are more content and subject specific, and can be used to give direction to a particular course, e.g. vocational agriculture. These intended learning outcomes will influence the content selection that is to be an integral part of the content for a particular course in vocational agriculture, e.g. Plant Science. The learner will have a major influence on how the content of the curriculum or the course is organized and sequenced.

The model shows that the instructional phase follows content selection. At this level there is interaction between the learner, the teacher, and the learning experiences (the content that the learner is to acquire). It is at this stage that objectives become extremely specific and are stated in performance terms so that they are student specific.

Evaluation which is both summative and formative is the last component. Formative evaluation is a continuous

process as the various components of the model are developed. At the developmental phase, each component is assessed before it is finally tried as part of the curriculum.

After instruction, the teacher will evaluate the learner to determine if learning took place. At the same time, evaluation is made of instruction to identify weaknesses and strengths of the teaching process. In the model the arrows from evaluation to the rest of the curriculum components are used to indicate continuous assessment of each component in order to make the curriculum dynamic.

Related Literature

A review was made of the indexes that are used for reporting research findings in education; as well the data base of information retrieval systems such as Educational Research Information Center (ERIC) was searched. From both the reviews and the search of ERIC it was found that a large number of studies were completed in agricultural education on a wide variety of subjects. In conducting the search of ERIC the following descriptors were used: agricultural research projects, and agricultural trends. From these studies, the following six: Curtis (1974), Pandya and Curtis (1977), Cullen and Lawrence (1978), Brimm and Cooper (1974), Harzman (1978), and Okorie (1974) were identified that were directed at vocational agriculture at the secondary school level and that have implications for the current study. From the review and search conducted no

studies were identified that are explicitly based on vocational agriculture curriculum.

Curtis, 1974

Curtis (1974), from Pennsylvania State University, conducted an investigation that dealt with grade eight students who showed interest in agriculture courses and the actual number of these students who later enrolled in grade nine courses in agriculture. This study involved 18 school systems in Pennsylvania where vocational agriculture was taught. The instrument used by Curtis was the Agricultural Biological Interest Inventory, and was used to measure agricultural interests of the participants. The variables that Curtis considered in this investigation included: student interests, academic background, sex and father's occupation.

A total of 2,376 grade eight students made up the population of this research; of these participants 1,281 were boys and 1,095 were girls. Of the 2,376 students who were involved in the study, 1,497 (987 boys and 570 girls) indicated their desire to enroll in one or more courses in agriculture in a high school grade. However, 221 of those who indicated an interest in agriculture courses actually enrolled in a grade nine agriculture course. Curtis compared the interest scores of those grade eight students who responded "yes" or "no" to future enrollment in agricultural class and those who actually enrolled. From this comparison, Curtis found that "students who enrolled had

significantly higher interest scores than those students who responded "yes" but did not enroll" (The Agricultural Education Magazine, July 1974, p. 20). Curtis gave the following as possible reasons why large numbers of students indicated interest in agriculture but few enrolled in it: in most schools, agriculture is offered on all or none basis; there were no courses in agriculture specifically taught on an interest basis only; the study involved 9th grade students only, therefore nothing can be said of students who might have registered in agriculture courses in grade ten or subsequent grades; and agriculture courses offered in high schools have vocational orientation (The Agricultural Education Magazine, July 1974, pp. 18-19).

Another finding of this study was that of the 510 girls who expressed an interest to enroll in a course in agriculture none actually enrolled in such a course in the ninth grade. Curtis (1974) felt that the lack of girls enrolling in agricultural programs could be partly attributed to social pressures both from the peer group and teachers. Curtis found that there was no significant correlation evident between father's occupation and student interest to enroll in agriculture courses. Another result of this study was that of the 221 students who actually enrolled in agricultural courses, 153 of them were identified by their agriculture teachers as being educationally disadvantaged.

The result of Curtis' research indicated that interest of the students who are to enroll in an agriculture

program is very important to the success of both the students and the program. However, it was also found that some student do enroll in some agriculture courses for interest per se while other students enroll in agriculture courses to earn a living through it. These findings reveal the need for a broad and flexible vocational agriculture program, such that students with different needs, interests and backgrounds could benefit from such a program. These findings will serve as a guide to the author in developing a vocational agriculture curriculum for the secondary schools of Kano State, Nigeria that will serve not only for students who are vocationally inclined to agriculture, but also to students who are avocationally inclined to it.

Pandya and Curtis (1977)

Pandya and Curtis (1977), both of Pennsylvania State University, conducted a longitudinal follow-up study of the research that Curtis completed in 1974, which was concerned with the interest of grade eight students to enroll in agriculture courses in grade nine. The follow-up study had these major purposes: to re-evaluate the data that was initially collected with the Agricultural Interest Inventory in the 1974 Curtis investigation; to determine if the students involved in that study did enroll in vocational agriculture; and to determine the success of the students who did enroll in a course in vocational agriculture.

To collect data for their study, the researchers

sent the name of students who participated in Curtis' earlier study to the agriculture teachers of the students' respective schools. These teachers were requested to identify those students who successfully completed two or more years of vocational agriculture classes in high school. Out of 221 students from the 1974 study of Curtis who initially enrolled in vocational agriculture, 129 were identified as being successful in that course. From the 2,376 students who were involved in the earlier study of Curtis, there were 2,155 who did not enroll in any agriculture classes. From this later group 228 students were randomly selected to respond to a questionnaire which consisted of 18 different "yes" and "no" response items. The first 10 items of the research questionnaire dealt with previous agricultural experiences, while the remaining eight items dealt with subject-matter for study in agriculture. Chi-square was the statistics used to analyze the responses of the participants to the questionnaire.

The findings of the follow-up study strengthens the finding of the previous study conducted by Curtis (1974) which dealt with the interest of junior high school students who enrolled in grade nine agriculture courses. These findings also indicated that students who enrolled in grade nine agricultural courses differed significantly in the agricultural experiences they had (such as helping with crops) than students who did not enroll in agricultural courses. One interesting result of the follow-up study

showed that proportionally more non-agricultural students had experiences of operating farm, garden, or lawn machine than agriculture students.

When preferences were compared in learning areas of vocational agriculture, 57.0 percent of non-agricultural students expressed interest in learning about job opportunities as compared to only 39.5 percent of agricultural students. Pandya and Curtis felt that "this data seems to point to a need for vocational counselling as well as appropriate vocational programming to meet student needs" (Agricultural Education, July 1978, p. 11).

This follow-up study shows among other things that interest alone does not necessarily guarantee success in vocational agriculture. Previous experiences in agriculture is an asset to students who enrolled in agriculture courses in order to prepare themselves for vocations in agriculture. The implication of this research to this study is that it will help the researcher to recommend the type of students or the prerequisite that a student should have to enroll in the courses that will be part of the vocational agriculture curriculum that will result from this research.

Cullen and Lawrence (1978)

In 1978, Cullen (a vocational agriculture teacher at North Iredell High School, Olin, North Carolina) and Lawrence, of West Virginia University, conducted a research that was concerned with "parents' evaluation of the vocational agriculture program." Their research was conducted in West Virginia. To obtain a population for their study, the researchers took a random sample of 220 parents of third-year vocational agriculture students who attended schools in West Virginia during the 1976-77 school year. The 220 parents selected to participate in the research were mailed a questionnaire. Ninety (40.9%) usuable questionnaires were received and analyzed.

Data from this study revealed that 85.5% of parents were satisfied with the local vocational agriculture program that was being offered and 92.2% of the participants believed that subjects studied under vocational agriculture would be useful to their children after leaving school. Future Farmers of America (FFA) activities were highly rated by 91.1% of the parents as most valuable for students. The results of the study also indicated that approximately 84% of parents were satisfied with the variety and content of classroom and shop instruction. Participants, however, were less enthusiastic about the adequacy of classroom and shop facilities, reference materials, shop tools and laboratory equipment. Two-thirds of the parents believed that skills learned by their children in vocational agriculture

courses would prepare these individuals for farming jobs; 56.6% thought the children would be prepared for an off-farm agricultural job; and 41.1% agreed that the children had acquired skills which would be used for further education in agriculture.

Concerning the adequacy of student supervision by vocational agriculture teachers to students who had been placed in a work experience program, Cullen and Lawrence found that parents were less than satisfied with this aspect of the teachers' performance. It was found that 24% of the parents indicated that teachers had not visited their students at their work station; 18.9% of the parents said that only one visit had been made. This lack of professional responsibility was of concern to these researchers because they were of the opinion that visits by teachers to work experience stations was a fundamental aspect of vocational agriculture education.

This research indicated the need to involve parents in developing and implementing a vocational agriculture program if it is to succeed. The findings of this study indicate to the author that parents' awareness, co-operation, involvement and approval as well as support should not be underestimated in implementing a vocational agriculture curriculum.

Brimm and Cooper (1974)

Brimm of Tennessee Technical University and Cooper, a vocational agriculture teacher at Cookeville, Tennessee (1974), carried out an investigation to obtain the opinions

of high school administrators in Tennessee's Upper Cumberland Region regarding vocational agriculture programs that were offered in their schools. The number of principals who participated in the study was 32, out of which 23 (71%) responded to the research questionnaire which consisted of 25 items. The data collected were tabulated and reported in a narrative format, using frequency tables and percentages.

The results of the study revealed that 21 (90.1%) principals agreed that vocational agriculture had contributed to the national economy of the United States and has been valuable to secondary school students. The same number of principals believed that vocational agriculture had prepared young people for work as well as any other secondary school subject. The principals unanimously concurred on the students' appreciation for and knowledge of vocational agriculture as more important than the number of students enrolled in this particular program. Ninety-one percent of the respondents agreed that course content in vocational agriculture should be determined by the type of agriculture found in the local area. All the 23 principals disagreed strongly with the practice of limiting admission into vocational agriculture programs to students who are low in academic ability. Eighteen principals believed that an active Future Farmers of America Chapter was essential for an effective program of vocational agriculture. All the principals agreed that priorities be accorded vocational agriculture materials and equipment.

Brimm and Cooper directed their investigation on the opinions of school administrators toward the vocational agriculture programs that were offered in their schools. Overwhelmingly the administrators agreed on the contribution of vocational agriculture to the national economy and that the aesthetic value students attached to the program was more important than the number of students who enrolled in it. Of central importance of this investigation to the study is the finding that 91% of the administrators agreed that course content in vocational agriculture should be determined by the type of agriculture found in the local area. The author will bear this in mind when developing the proposed model vocational agriculture curriculum for Secondary Schools of Kano State, Nigeria.

Harzman (1978)

The author of a research study in Paraguay, Harzman (1978), stated that "in order to increase the food supply and income of farmers in Latin-American countries, a well planned and organized program of agricultural education is essential" (p. 22). The need for such an organized program of agricultural education motivated Harzman to conduct research for a doctoral dissertation (1977) which was titled, "The Identification of Technical Agriculture Competencies for Secondary Students in Agriculture Education Programs in Latin-America, with Emphasis on Paraguay." The purpose of that investigation was to identify the technical agriculture competencies needed by secondary school students in agriculture education

programs in this third world nation.

The methodology used by Harzman was to establish a 24-member jury of experts, who were asked to rate 104 agriculture competencies in eleven categories according to their importance for students in secondary-level agricultural schools in Paraguay. The rating of the 104 competencies was done using a five-point Likert-type scale. Computer analysis of the data was performed by using mean scores, the analysis of variance, and Tukey's multiple comparisons statistical procedures.

The findings of this study revealed that there was a large degree of agreement as to the level of importance for the competency items among the experts who were asked to rate each competency. Out of 104 competencies, 30 were rated "very important," 56 received a rating "of some importance," and the remaining 18 competencies were rated "of little importance." Harzman (1978) believes that data from this study indicated that "it did appear that the jury members placed a higher rating on the applied competencies {such as: perform the practices and techniques used in soil conservation; perform the techniques of applying the various forms and kinds of fertilizer; and apply the management practices and techniques involved in poultry production} than on the theory competencies" (p. 23). Harzman was of the opinion that data from this study would assist the agriculture teachers in Paraguay by providing a basis on which to develop an improved

agriculture education curriculum.

The implication of this research to the study centered on the agreement of the agriculture experts that participated in the research on the rating of important competencies a vocational agriculture program should consist. The finding that the experts placed a higher rating on the applied rather than on theory competencies will be a guide to the researcher in selecting learning objectives and activities for the vocational agriculture curriculum that will result from this research.

Okorie (1974)

Okorie (1974) completed research on agricultural education for a doctoral dissertation at Iowa State University. The title of the research was "The Impact of Agricultural Education on Farm Production in Eastern Nigeria." The participants selected for this study included 46 agriculture teachers and 200 agriculture students from Eastern Nigeria. In reporting the findings of his study, Okorie (1974) did not include the type of instrument that was used to collect data, and the type of statistics that were used to analyze the collected data.

The data analyzed from the study indicate that of 46 teachers who were involved in the research, only four were reported to have taught agriculture for up to 15 years, whereas a majority of the remaining 42 teachers involved taught agriculture between one to three years.

A majority of the teachers experessed deep interest for the provision and the use of teaching aids in their training programs as well as in their secondary school programs. On the subject of job opportunities, Okorie noted that "generally, the teachers were very pessimistic about job opportunities for agricultural students in becoming established in the occupation of farming" (p. 114).

The study conducted by Okorie revealed that only two out of the 46 teachers expressed satisfaction with the government efforts in supporting agricultural programs in secondary schools. Okorie concluded that such a massive "rejection of the government efforts indicates to some extent that something was wrong with the government in its relationship with the agricultural programs in secondary schools" (p. 114). The results of the Okorie study confirmed what the writer indicated in a previous section of this chapter when he wrote about the lack of government attention to vocational agricultural education in the secondary schools of Kano State.

The study of Okorie revealed that agricultural subjects in secondary school in Eastern Nigeria consisted mainly of crops and soil, farm management and animal science, with skeletal instruction in farm mechanics, general agriculture, forestry and horticulture. Okorie pointed out that the agricultural syllabus deals specifically

with basic facts in agriculture, and these facts were designed purposely to enable the students to pass their comprehensive final examinations (p. 88). A large percentage of agriculture teachers maintained that agricultural courses should be taught from a vocational point of view. More than 95% of the 200 students involved in the study indicated the need for agriculture to become part of the secondary school curriculum in rural areas. Similarly, the same percentage of the students expressed great need and interest for the establishment of a national youth organization for the promotion of agriculture.

On the type of farming implements used in the schools, the findings revealed that there was a persistent complaint by the students that the use of hoe and machete for the school farm activities essentially taught the students nothing. More than 92.0% of the students would like to see farm machinery and equipment introduced in the agricultural programs in secondary schools in Eastern Nigeria.

The study conducted by Okorie (1974) in Eastern Nigeria indicated the dire need for the provision of vocational agriculture programs at the secondary school level in Nigeria in general. One major weakness of this particular study was the fact that it was limited to one geographical area of the nation--Eastern Nigeria.

It is clear from the review of the various studies

conducted on vocational agriculture at the high school level that a successful vocational agriculture program should contain, among other things, the integration of both theory and practical learning activities; provisions for classroom, shop and laboratory facilities that are up-to-date; involvement of the parents in developing vocational agriculture programs; establishment of a young farmers' association; and the identification of most important agricultural competencies.

Summary

This chapter was divided into three sections. The first section discussed an overview of Nigeria in general and Kano State in particular. The discussion in this section centred mainly on the educational system in Nigeria, from traditional African education which was conducted in an informal way; the coming of the Missionaries to Nigeria and their influence on the Nigerian both religiously and educationally. The educational situation as it existed during the time of the study was also discussed. A detailed analysis of the levels and administration of education in Kano State was also presented in this section.

The second section of this chapter reviewed the writings of authorities on curriculum. A search for the definition of the term "curriculum" was undertaken and one definition by Derr (1977, p. 152) was accepted for use in this study. The elements or components that comprise a

curriculum were identified from the analysis of literature. The components that were identified for this analysis were: philosophical statement; aims, goals and objectives; content; learning activities; and evaluation. Each of these components were discussed in detail. An analysis of current curriculum models that were developed by curriculum theorists formed the last part of the second section.

Section three discussed six related research investigations that were identified from a literature review and a search of data bases that have implications to this study. The findings of these studies indicated that there was a need to provide for the integration of both theoretical and practical learning activities in vocational agriculture courses. Other elements needed for an effective and efficient vocational agriculture program for secondary school students include: provision for classroom, shop and laboratory facilities; the involvement of parents in developing the vocational agriculture program and the establishment of young farmers' associations. The research conducted by Okorie (1974) on Nigeria's agriculture production revealed the need to provide vocational agriculture programs for the secondary schools.

CHAPTER III

ANALYSIS OF DATA

The content of Chapter II includes an overview of Nigeria in general and Kano State in particular. An extensive discussion on the Nigerian educational system as it existed at the time of the study and a review of the literature on the writings of authorities on curriculum as well as an analysis of six research studies that were concerned with vocational agriculture at the secondary school level and that had implications for this study are part of the content of the last chapter.

This chapter analyzes the data that was received from administrators of participating schools. Part of this analysis was a content analysis of the curriculum materials that were received. This analysis was made to determine if the curriculum materials included the curriculum components that appear in the literature on curriculum.

It will be recalled from Chapter I, under methodology, that 35 schools were randomly selected out of 70 schools that satisfied the criteria that were established to select schools to participate in the study. A letter was prepared and mailed to the administrators of these 35 schools asking them to co-operate in the research by furnishing the researcher with any of the following: a curriculum guide;

a course description; a course outline; a program of study; or a syllabus. Nineteen (54.2%) replies were received, two of which were determined by the researcher as being unusable. The reasons why the two letters were unusable were stated in the first chapter.

List of Participating Schools

Table 7 is a list of participating schools, the state in which the school is located, and the type of curriculum material that each school sent.

Identifying Curriculum Components

From the literature review on curriculum in Chapter II, it was demonstrated that there was an agreement among authorities, specialists or practitioners on curriculum that an "ideal" curriculum should consist of the following elements or components: a philosophical statement; aims, goals and objectives; curriculum content; learning experiences; and evaluation.

Results of the Study

Data in Table 8 indicate the curriculum components that were found in the curriculum materials of schools that were analyzed from schools that participated in the research.

Table 7

List of Participating Schools

Name of School	State	Type of Curriculum Material Sent
Haven High School (AVTS)[1]	Kansas	No response
McPherson High School (AVTS)	Kansas	No response
Barnsville High School	Minnesota	No response
Blooming Prairie High School	Minnesota	Curriculum Guide
Byron High School (H.S.)	Minnesota	Course Description
Duluth AVTI[2]	Minnesota	Course Outline
East Grand Forks AVTI	Minnesota	Offers post-secondary programs only.
Farmington High School	Minnesota	No response
Forest Lake High School	Minnesota	Curriculum Guide
Frazee High School	Minnesota	Letter returned
Grand Rapids High School	Minnesota	No response
Hastings High School	Minnesota	Course Guide
Holdings Ford High School	Minnesota	Course Outline
Lewiston High School	Minnesota	No response
Little Falls High School	Minnesota	Course Description
Melrose High School	Minnesota	Course Description
Minneapolis (Roosevelt) High School	Minnesota	Course Description
North Field High School	Minnesota	Course Outline
Owatonna High School	Minnesota	Curriculum Guide
Perham High School	Minnesota	No response
Pierz (Healy) High School	Minnesota	No response
Watertown-Mayer High School	Minnesota	Curriculum Guide
Willmar High School	Minnesota	No response
Winona AVTI	Minnesota	No response

Table 7 (cont'd)

Name of School	State	Type of Curriculum Material Sent
East High School	Wyoming	No response
Lander Valley High School	Wyoming	No response
Bear River High School	Utah	Course of Study
Bingham High School	Utah	No response
Clearfield High School	Utah	Course of Study
Dans High School	Utah	Course of Study
Payson High School	Utah	No response
Spanish Fork High School	Utah	No response
Jamestown Valley Vocational Center	North Dakota	Course Outline,
Minot High School	North Dakota	Program of Studies
Des Moines High School	Iowa	No response

Note: [1]AVTS means Area Vocational and Technical School.
[2]AVTI means Area Vocational and Technical Institution.

of Participating Schools

School Name	State	Curriculum Components				
		Philosophical Statement	Aims, Goals, & Objectives	Content	Learning Experiences	Evaluation
Blooming Prairie H.S.	Minnesota		✓	✓	✓	
Byron High School	Minnesota		✓	✓	✓	
Duluth AVTI[1]	Minnesota		✓	✓	✓	
Forest Lake H.S.[2]	Minnesota		✓	✓	✓	✓
Hastings H.S.	Minnesota		✓	✓	✓	
Holding Ford H.S.	Minnesota			✓		
Little Falls H.S.	Minnesota		✓	✓		
Melrose High School	Minnesota			✓		
Minneapolis H.S.	Minnesota		✓	✓	✓	
North Field H.S.	Minnesota		✓	✓	✓	
Owatonna	Minnesota	✓	✓	✓	✓	
Watertown-Mayer	Minnesota		✓	✓	✓	
Bear River H.S.	Utah		✓	✓		
Clearfield H.S.	Utah	✓	✓	✓		
Dairs H.S.	Utah	✓	✓	✓	✓	
Jamestown Valley Voc. Center	North Dakota			✓		
Minot H.S.	North Dakota		✓	✓		
TOTAL		3	14	17	10	2

Note: [1]AVTI means Area Vocational & Technical Institute.

[2]H.S. means High School.

✓ indicates the presence of that particular curriculum component in the curriculum materials of participating schools.

Blank indicates the absence of that particular curriculum component in the curriculum materials of the participating schools.

Philosophical Statement

It was established from the literature review on curriculum that the first step in curriculum development is to develop a philosophical statement for the curriculum, the function of which is to give direction to both the society and the educational system of the society.

The review of the curriculum materials (see Table 8) received from participating selected schools indicated that only 3 (17.6%) out of the 17 curriculum materials include a philosophical statement. An example will suffice to indicate the type of philosophical statements contained in the curriculum materials reviewed. Part of the philosophical statement on vocational agriculture from the course of study received from Clearfield High School, Utah states:

> It is because of agricultural businesses in this country that the United States is a world leader today, and the United States will remain a leader only as long as this Nation's Agriculture continues to do the job that it has done in the past. (Davis County School District, Course of Study for Vocational Agriculture Department, 1979, p. 1)

Aims, Goals and Objectives

The terms aims, goals and objectives are used as synonyms by curriculum authorities; however, Zais (1976) developed a hierarchical order for aims, goals and objectives. According to Zais, aims are statements that describe expected life outcomes, which are based on a value schema and are borrowed from philosophical statement. Goals refer

to school outcomes, while objectives are more proximate to the learner, as they indicate specific outcomes for classroom instruction (p. 306). For the purpose of this study, aims, goals and objectives are used as synonyms.

Data from Table 8 reveal that 14 (82.4%) of the curriculum materials that were reviewed and analyzed have either aim, goal or objective statements. An analysis of these materials indicates that of the curriculum materials that were received from 17 schools only three contain goal statements, while 13 of the curriculum materials reviewed included objectives. However, it is pertinent to point out that only a small number (two) of the curriculum materials that were analyzed contained both statements of goals and objectives.

Some of the statement of aims and goals are global, such as the goal statements contained in the curriculum material received from Hastings Senior High School, Minnesota, which stated that:

> Vocational education has come to the foreground in the past few years. Our comprehensive high school is trying to meet the needs of those who, upon graduation, will enter the world of work and those who will enroll in vocational schools and for those who are college bound. (Course Guide 1980-81, p. 1)

The goal statement of Agriculture 10, for Blooming Prairie High School reads:

> To teach the proper selection of market and breeding animals for beef, swine, and sheep, the selection of dairy cattle, the accurate determination of land capability and its use. To teach feeds and feeding of the major classes of farm livestock and how animals differ in their

nutritional requirements. To teach production of the lesser known crops, including the small grains, and forage crops. (Curriculum Guide 1980, p. 4)

Where objectives were provided in the curriculum materials that were reviewed, their generality or specificity differ considerably. While in some curriculum materials received from participating schools, the statements of objective are more like statements of aim and goal, for example: to assist students in attaining skills in the use of tools necessary to do simple construction and repair jobs (Vocational Agriculture Department, Curriculum Guide 1980, Owatonna High School, p. 1), while other statements of general objective are similar to performance objectives, such as: students will average a score of 30 or more on livestock judging; students will average a score of 65 or more on soils use (Blooming Prairie High School, Curriculum Guide, 1980, p. 4).

Below is a sample of statements of objectives from various curriculum materials that were reviewed.

Objectives of Vocational Education in Agriculture

A. To train for gainful employment in agriculture
   1. To train for gainful employment in agricultural subjects for those planning to engage in or already engaged in farming or ranching.
   2. To develop competencies in agricultural subjects for those planning to engage in or already engaged in occupations other than farming or ranching that require knowledge or skills in agriculture.
   3. To develop leadership and civic responsibility through participation in group activities of specific youth and adult organizations.

(Course of Study for Vocational Agriculture Department, Davis County School District, Farmington, Utah, 1979, p. 2)

Agriculture I
Objectives:
1. To further the interest in agriculture and the home farm.
2. To develop a suitable supervised farming program (make a beginning).
3. To learn selection, use, maintenance and safety of all shop tools and equipment. (Northfield Vocational Agriculture Course Outline, Northfield High School, 1979, p. 1)

Course Objective: Forestry Occupations
Upon completion of the Forestry Occupation course, the student will have: (1) developed an understanding of occupational opportunities in forestry and (2) developed those competencies which will provide the student with the skills necessary for job entry level employment in forestry. (Forestry Occupation, Duluth Area Vocational Technical Institute, Duluth, Minnesota, 1979, p. 1)

It is apparent from the analysis of the curriculum materials that were received that there is a definite relationship between statements of aims and goals and statements of general objectives. Below is the statement of goals and general objectives of Agriculture II from Blooming Prairie High School Curriculum Guide 1980. It states:

Goals:
To teach the bases of record keeping for the accounting and record analysis. To teach the use of fertilizer to maximize crop returns and increase profits.

Objectives:
1. Students will earn a score of 60% or more on all tests and quizzes.
2. Students will correctly enter the transactions from the sample farm problem to the farm accountbook.
3. Students will determine the fertilizer required from a specified crop from a soil test.
4. Students will make a fertilizer recommendation based upon a soil test. (p. 5)

Content

Content is defined in the educational literature as the information, ideas, concepts, generalizations, principles, and the like, that the student is expected to learn after being exposed to it in a learning environment. In order to effectively and efficiently achieve the educational aims, goals and general objectives of a curriculum, the selection and organization of content is most important if learning is to progress from the simple to the complex.

The result of the content analysis of the curriculum materials of the schools that participated in the study supports the importance given to content by curriculum practitioners. Data in Table 8 show that all the 17 curriculum materials that were analyzed include curriculum content. This represents 100%.

From the review and analysis of the curriculum materials used in the study, the researcher identified five broad areas that make up vocational agriculture. These areas are: AGRICULTURAL MECHANICS, which deals with tools and machinery that are used with farming occupations; PLANT/CROP SCIENCE, which is the study of the different plants, crops and weeds, as well as the diseases and cures of these plants; ANIMAL SCIENCE, dealing with different farm animals, their uses, feeds and feeding, breeding and care and diseases; SOIL SCIENCE, dealing with what soil is, its composition, its importance to man, soil and water, and the minerals in it; and AGRI-BUSINESS AND MANAGEMENT, which

is the study of different careers in agro-industries, recording keeping, accounting, banking insurance and legal aspects of farming. For the purpose of this study, Plant/Crop Science, Animal Science and Soil Science will be referred to as: PLANT/CROP TECHNOLOGY, ANIMAL TECHNOLOGY, and SOIL TECHNOLOGY. This is because of the emphasis that will be given to the practical or applied knowledge and skill of these technologies rather than theoretical knowledge that is associated with each technology.

The scope of the content contained in the curriculum materials that were reviewed was broad and interdisciplinary. That content was a blend of not only agricultural materials, but also that of biology, physics, chemistry, geography, machine shop, woodwork, building construction, drafting and some engineering.

To illustrate:

Vocational Agricultural Shop Course Content:
A. Farming and Shop Safety
   1. Shop rules
   2. Shop safety
   3. Machinery safety
   4. Power tool safety....
F. Arc and Gas Welding
   1. Safety with welding
   2. Learning gas and arc welding
      Flat position, T-welds, Butt welds, Vertical welds, Horizontal welds, brazing, soldering, and cutting.
G. Farm Electricity
   1. Principle of electricity
   2. Safety with electricity
   3. Parallel and series circuits
   4. Timers, sensors, and electric motor controls.

(Watertown - Mayer High School, Curriculum Guide, 1979, pp. 1-2)

Soil Management

Units of instruction include: natural resources, soils, ag. mechanics, leadership development, supervised occupational experience programs, livestock, crops, agri-business, and horticulture. (Melrose High School, Course Description, 1979, p. 39)

Crop Production

Curriculum Content includes: selection, tillage methods, planting procedures, fertilization, cultivation, insect and disease pests and control, harvesting storage, and marketing as they apply to: corn and soybean production, small grain production, legume and grass production, silage and haylage and an overall view of crop program management, rotation, government crop programs, and labor schedules. (Holdingford Public School, Course Outline, 1979, p. 43)

Animal Science

Unit: animal industry and careers; animal physiology; fundamentals of nutrition; providing nutrient requirements; poultry products (meat and eggs); meats (beef, veal, pork, lamb); dairy products (milk, cheese, ice cream, butter and other manufactured products); . . . . (Forest Lake Senior High School, Agribusiness and Natural Resource Department, 1979-80, p. 8)

Agri-Business

Topics covered in Agri-business include: Legal forms of business, marketing, hedging, futures market, agricultural products, agricultural prices, business organizations, directing, advertising, public relations, and business control and management, and agricultural accounting. (Melrose High School, Course Description, 1979, p. 39)

In some of the curriculum materials that were received, the sequence of the content for some of the courses was integrated, where the content that was learned in one course provided the base for subsequent courses. An example from the curriculum material of Clearfield High School for Agricultural Mechanics I, II, and III (Small Engines) is used:

Small Engines

Agriculture Mechanics I: Importance of small engines, makes, models and types. Check-up of engines, compression, combustion, ignition, disassembly repair, assembly adjustments and painting.

Agriculture Mechanics II: Inspection, principles of operation, carburation, ignition, compression, bearings, overhaul stop, start and store adjusting, painting, maintenance.

Agriculture Mechanics III: Review of operations, review of maintenance, overhauls, tune-ups, adjustments, applications.

(Clearfield High School, Course of Study for Vocational Agriculture Department, Utah, 1979, pp. 27, 31 and 35)

Learning Experiences

Some leading curriculum practitioners such as Beauchamp (1968), Tyler (1949), Taba (1962) and Zais (1976) believe that nothing concrete can be achieved from a curriculum if learning experiences are not provided to students. [illegible]962, p. 265) defined learning experiences as the [illegible]operations that students employ in learning content [illegible] curriculum.

The result of the analysis of curriculum materials [illegible]cate that 58.8% of the 17 curriculum materials that were a[illegible]yzed did include learning experiences that could provide f[illegible] interaction between the student and the curriculum c[illegible]ntent.

The Northfield High School, Minnesota, Agriculture I program contains as part of learning experiences such vicarious means of learning as: contests, field trips, film, resource speakers, etc. (Northfield Vocational Agriculture, Course Outline, 1979, p. 2). The course

description received from Byron High School, Minnesota, has advanced crop production as one of the courses offered under Vocational Agriculture. "Class activities {in this course} include using the computer as a crop management tool and much experimentation with plants" (Byron High School, Registration Guide, 1980, p. 2). Agriculture 9 course in Blooming Prairie High School, Minnesota, has the following under "Media Resources: Reading-texts and magazines, audio-visual filmstrips, slides, films, and overhead projections, {as well as} properly organized field trips" (Blooming Prairie High School, Curriculum Guide, 1979, p. 2). The curriculum guide received from Owatonna High School, Minnesota includes learning activities for every course in agriculture offered at the school. For instance, Agriculture II: Agricultural Economics lists these learning experiences to teach curriculum content.

> A. 'Work out' a canned or current problem using the Minnesota Farm Account Book.
> B. Keep records of the home farm using Minnesota Farm Account Book.
> C. Work out depreciation problems.
> (Vocational Education Department, Owatonna High School, Agri-Business and Natural Resources, 1979, Minnesota, p. 61)

Evaluation

To find out whether or not the aims, goals and objectives of a curriculum are achieved, whether or not the content is effectively transmitted through learning experiences and instruction, as well as to find out the weaknesses and strengths of both the curriculum and the

instruction, evaluation is a requisite. There is a controversy among curriculum authorities on the definition of the term evaluation. Some of the authorities define evaluation in very broad terms to include all that the school provides, while other authorities on curriculum define evaluation in a very narrow sense to apply to what the student learns. Regardless of the definition for evaluation that is used, these curriculum authorities all agree that evaluation is important to the development and improvement of a curriculum.

From the review and analysis of the materials received from participating schools, only 2 (11.76%) of the 17 documents that were analyzed contain some form of evaluation.

The curriculum materials for the Vocational Agriculture program at Forest Lake Senior High School includes, at the end of each course outline, a guideline for evaluation that the teacher might use. Course 0911--Forestry--for this school gives the following as an evaluation guide:

Classroom involvement and demonstrated skills and competencies	40%
Special projects	20%
Tests and final exam	20%
Supervised Occupation Experience (SOE)	20%
Future Farmers' Activities (FFA)	Extra Credit

(Agribusiness and National Resource Department, 1979-80, p. 6)

Other course outlines that were analyzed from Forest Lake Senior High School include a similar guideline for evaluating student performance.

Each course that comprises the Vocational

Agriculture program of Blooming Prairie High School includes a section on how students are to be evaluated. The evaluation component for this school is not as comprehensive as the evaluation component of Forest Lake Senior High School.

Summary

The main emphasis of this chapter is on the content review and analysis of the curriculum materials that were received from schools that participated in the study. The name, location, and the type of materials that each school participating in the study sent were provided in this chapter.

The result of the review and analysis of the curriculum materials analyzed was outlined in a tabular form which was followed by a written explanation of the results. The following is a summary of the findings of the study.

Philosophical Statement. Out of the 17 curriculum materials that were analyzed, only three included a statement of philosophy on vocational agriculture.

Aims, Goals and Objectives. Fourteen of the analyzed 17 materials contained statements of either aim, goal or objective. Out of the 17 curriculum materials reviewed only three contain goal statements, while 13 included statements of objective. Only two of the curriculum materials that were analyzed contained both statements of goals and objectives.

Content. All the 17 curriculum materials that were received contained curriculum content. This represents 100%.

Learning Experiences. The result of the review of the materials indicated that 10 (58.8%) of the 17 curriculum materials that were analyzed did contain learning experiences.

Evaluation. The review and analysis of the materials received from participating schools showed only two (11.76%) of the 17 documents included some form of evaluation.

CHAPTER IV

CURRICULUM CONTENT FOR VOCATIONAL AGRICULTURE CURRICULUM

Chapter III contains the results of the content review and analysis of the curriculum materials that were furnished the researcher from the schools that participated in the study. These curriculum materials were reviewed and analyzed to determine if they contained the components or elements of a curriculum that were identified from the review of the literature on curriculum (see Chapter II). The result of the review of each of the curriculum components and a sample from each of the curriculum materials that were reviewed are part of the previous chapter.

Chapter IV is based on the content of the Vocational Agriculture curriculum that was developed from the results of this study and that was sent to the two consultants for their review and criticism. Included as content of this chapter is an explanation of a paradigm which shows the relationship of the vocational agriculture to the general education curriculum at the secondary school level for Kano State. Content of this chapter also includes a discussion on the curriculum model developed for this study. The comments that were made by the reviewers to the curriculum content and the response to these comments by the researcher form the last part of this chapter.

The Paradigm

The vocational agriculture curriculum that was developed from this research is to be an integral part of the general education structure that is offered in the secondary schools of Kano State, Nigeria.

At the time of the study, secondary education was six years in duration, and was divided into the: junior secondary school stage and senior secondary school stage; each of these stages takes the student three years to complete. The junior secondary school is both pre-vocational and academic, and is used to provide the learner with the basics for the next stage of educational development which is the senior secondary level. The senior secondary school is comprehensive and is based on a core-curriculum which is designed to broaden pupils' knowledge and outlook and is used to prepare the student for further education. It is within this educational structure that the vocational agriculture curriculum developed from this study will function. Below is a paradigm that illustrates how this curriculum will be integrated with other curricula that comprise the general education program of both the junior and the senior secondary school. It will be recalled from Chapter II under Education Structure, 1980, that general education is composed of the following courses: Hausa (language), English, Religion, mathematics, arts and crafts, needlework and dress-making, integrated science, social/cultural studies, human economics,

agricultural science, health science and pre-vocational courses that include machine-shop, carpentry, etc.

Figure 11

A Paradigm Showing the Relationship of Vocational Agriculture to General Education at the Secondary School Level

Type of School	Year	VOCATIONAL
Senior Secondary School	Sixth	Vocational agriculture III (emphasis by student in 1 area)
	Fifth	Vocational agriculture II (emphasis by student in 2 areas)
	Fourth	Vocational agriculture I (emphasis by student in 3 areas)
Junior Secondary School	Third	Introduction to Vocational Agriculture
	Second	General Agricul- ture Know myself
	First	Know myself GENERAL

Adapted from Silvius and Bohn; Organizing course materials for industrial education, 1961, p. 64.

Information in the paradigm shows that in the first year of the junior secondary school the learner will concentrate on those subjects that are devoted to general education and that will provide the learner with the necessary skills to communicate verbally, in writing, and through computations. It is at this level that the student learns the basic scientific principles, laws, and theories from courses in the sciences. The study of both English and

Hausa begin at this point of the student's education. Students at this level and with the help of teachers, parents, peers and others make an effort to determine their self-concepts, abilities, capabilities, personality, etc.

In the second year and succeeding years less emphasis is placed on the learning of knowing self and greater emphasis is placed on the study of the liberal arts subjects that were studied during the first year. In this year of the six-year program the student becomes exposed to Vocational Agriculture through the course content of General Agriculture. General Agriculture is a course that provides the student with an overview of Nigerian agriculture and its importance to the economy of Nigeria as well as its importance to Nigerian society.

It will be noted from the paradigm that in the third year of the six-year program of the secondary level, the student spends approximately one-quarter of the time studying agriculture and the other three-quarters of the student's time is spent studying the liberal arts component of general education. In this year, Introduction to Vocational Agriculture is the course that is used to have the student develop the requisite knowledge, understandings, and attitudes toward agriculture as a business as well as a vocation. The proposed content for this course is detailed in a subsequent section of this chapter.

The purpose of the first three years of the six-year program is to introduce all students to vocational

agriculture so that they get a "feeling" of what vocational agriculture is and the contribution it can make as either a vocation or an avocation.

The paradigm illustrates that as the student continues to study at the senior secondary school level, the amount of time that the student spends studying vocational agriculture is increased, while the amount of time that the student spends studying the liberal arts component of general education is decreased.

In the fourth year those students who have made a decision to work in agriculture as a vocation begin to concentrate more heavily on vocational agriculture. This concentration begins when the student studies Vocational Agriculture I by reviewing what was done in the General Agriculture course that was completed in the third year of the junior secondary school. From the content of Vocational Agriculture I, the student should develop skills that will permit him to comprehend, analyze and apply in a practical situation the basic concepts taught in this course. In this course the student begins to study the interrelationship of agricultural mechanics, animal technology, plant/crop technology, soil technology and their effect and influence on agricultural production and agri-business. The content of this practical course is detailed in the next section of this chapter.

According to the paradigm the next course in the vocational agriculture sequence is Vocational Agriculture II. This course is a continuation of Vocational Agriculture I

and the student studies in greater depth the technologies that were previously taught. At this point in the student's development the student is expected to select any two of the areas from plant/crop technology, animal technology, agricultural mechanics, soil technology, or agri-business. One-half of course time will be devoted to practical activities that will include on-the-job training, work programs, site visits to farms and experimental stations.

In the sixth year of the program, students who are vocationally inclined toward vocational agriculture will be required to enroll in Vocational Agriculture III. In this course the student will concentrate on one of the areas selected from plant/crop technology, animal technology, soil technology, agricultural mechanics, or agri-business. The content of this course is so designed as to force the student to spend three-quarters of his time in a practical working situation in the area selected for concentration. The course content of this course is built upon the content of the two previous courses to develop the spiral effect of the curriculum.

The content of the curriculum at this stage should be of first year college quality and students will cultivate the skills of objective judgement. Principles and concepts are mainly to be used instead of mere facts and information. Serendipity and synergy will be encouraged. Skills as well as business practices and management should be mastered at this stage.

The purpose of the second three years of the program is to give both college bound and students seeking employment in agriculture the understanding, knowledge and skills necessary for successful entrance into either college or the world of work.

Use of the Curriculum Model

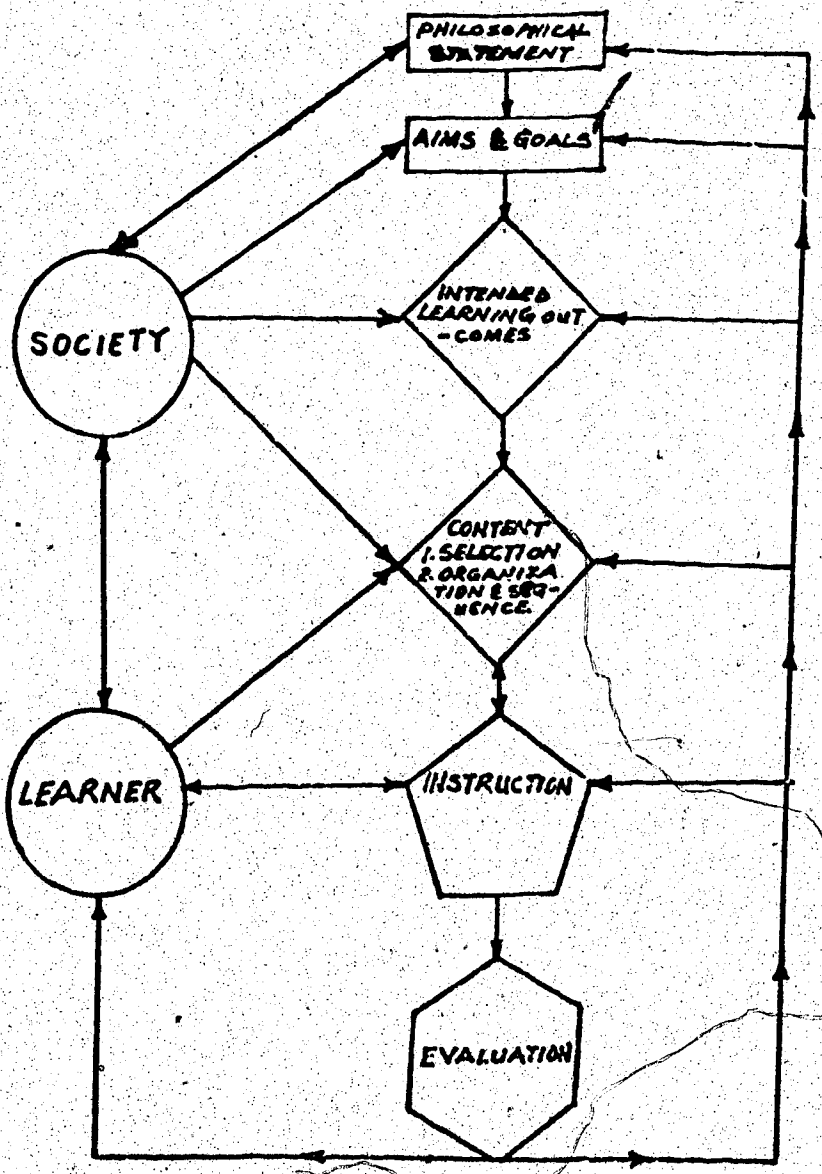
The curriculum model (Figure 10) that was developed from the review of the works of curriculum theorists and model builders such as Johnson (1967), Macdonald (1965), and Weinstein (1970) was used as a guide for this study in developing the vocational agriculture curriculum for the secondary schools of Kano State, Nigeria. For detailed explanation of the curriculum model, see Chapter II.

Philosophical Statement. It was found from the review of the literature on curriculum that the function of philosophical statement is to give direction to both the society and the educational system of that society.

The Nigerian Constitution places the responsibility for the establishment of the philosophy of Nigerian education on the Federal Government. This makes it unwise for the researcher to attempt to develop a new and separate philosophical statement for the vocational agriculture curriculum for secondary schools of Kano State, Nigeria. It is in view of this reason the philosophy of Nigerian education as stipulated by the Federal Government in its National Policy on Education (1977) was adopted for this curriculum

Figure 10

Curriculum Model for This Study



and is stated in this way:

> Nigeria'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 of the nation at the primary, secondary and tertiary levels, both inside and outside the formal school system. . . .
> Nigeria should be a free, just and democratic society, a land full of opportunities for all its citizens, able to generate a great and dynamic economy, and growing into a united, strong and self-reliant nation . . . . (pp. 4-5)

Aims, Goals and Objectives. It was confirmed from the educational literature that aims, goals and objectives give direction and guidance to what the curriculum should cover; what to emphasize; content to select; and which learning experience to stress as well as what to evaluate. Aims, goals and objectives are used as synonyms for this study.

The developed vocational agriculture curriculum, as pointed out above, will be integrated with the secondary school curriculum, and this demands that its aims, goals and objectives should be in harmony with the aims, goals and objectives of secondary education as established by the Federal Government of Nigeria. Secondary education in Nigeria has the following broad aims:

> 1. Preparation {of students} for useful living within the society; and
> 2. Preparation {of students} for higher education. (National Policy on Education, 1977, p. 10)

Provided in this National Policy on Education are also the more specific aims of secondary education, which are outlined as to:

a) Provide an increasing number of primary school pupils with the opportunity for education of a higher quality, irrespective of sex, or social, religious, and ethnic background;
b) [illegible]ify its curriculum to cater for the [illegible]nces in talents, opportunities and [illegible]ossessed by or open to students [illegible]their secondary school course;
c) [illegible] students to live effectively in our [illegible]rn age of science and technology; and
d) [illegible]se a generation of people who can think [illegible]r themselves, respect the views and [illegible]eelings of others, respect the dignity of [illegible]abour, and appreciate those values specified under our broad national aims, and live as good citizens. (p. 10)

Added to the above aims of secondary education, the vocational agriculture curriculum has the following objectives which were developed from the research:

1. It is the prerequisite of the vocational agriculture program to help students integrate, reinforce and apply the academic disciplines.
2. To meet the needs, interests and abilities of those students who, upon graduation, will enter the world of work and those who will enroll in colleges of higher learning.
3. To expose students to a comprehensive representation of the technologies in agriculture and their effect on human life, as well as the "know-how," "why," "when," "where" and "what" aspects of agriculture.
4. To make students aware of the opportunities and intelligently plan career programs in agriculture requiring college or other types of education.
5. Provide exploratory experiences to students who are avocationally inclined to agriculture.
6. To develop and apply on the part of the student desirable personality traits, habits, attitudes, human relations, business management and leadership skills that are required for success in agricultural occupations.
7. To prepare students to be more understanding and efficient consumers of farm products and appreciate agriculture for its intrinsic values.

Intended Learning Outcomes (ILOs)

An intended learning outcome (ILO) was defined by Posner and Rudnisky (1978) as the "statement of what the student is to learn" and it may be a statement "about facts, ideas, principles, capabilities, skills, techniques, values or feelings" (pp. 15-16). ILOs were used in the curriculum model instead of objectives because objectives were used as synonyms to aims and goals. Performance objectives were omitted from the curriculum content of the model because the researcher felt that these specific instructional objectives should be left for the instructor of the course to determine in order to instruct the students effectively.

The intended learning outcomes (ILOs) are provided prior to the content of each phase of the vocational agriculture curriculum.

Curriculum practitioners all concur that content includes: information, ideas, concepts, generalizations, principles and the like. The areas identified as content of the vocational agriculture curriculum are broad and mostly categorized under a concept or a principle. It is suggested that the teacher should break either the concept or principle into smaller units according to students' level of ability and the resources and the facilities that are available to the teacher to give meaning to the content.

Below is an outline of the proposed content of the vocational agriculture curriculum for the first to the sixth

year of secondary school that was submitted to the two reviewers who are specialists in agriculture and who served as agricultural specialists in Nigeria.

Data in Table 8 show that 14 of the 17 curriculum materials received included aim, goals, and objectives. The objectives from these materials included both general and specific objectives. It was from the specific objectives that the intended learning outcomes (ILOs) for the proposed curriculum were developed.

The content for the proposed curriculum was partially taken from the curriculum materials that were received and analyzed. Additional content was taken from the West African Examination Council Syllabus, 1980.

First Year - Know Myself

Intended Learning Outcomes (ILOs)

1. Assists students to determine or become aware of what they are.
2. Helps students identify their interests and abilities.
3. Develops in the students the sense of responsibility in one's actions.

Content

I. Individual differences
   A. worth as an individual;
   B. I as a person;
   C. temperament, motivation, etc.

II. Interest

A. what is an interest?

B. how is interest developed?

C. the effect of interest on the individual.

III. Ability

A. what is an ability?

B. physical and psychological traits associated with ability.

C. awareness of abilities, capabilities and limitations.

Reviewer's Comments. No comments were made by reviewers on all aspects of the first year curriculum content.

Researcher's Response. Since the reviewers made no comments on the material for the first stage of the entire program, the research made no modification or alterations to this portion of the curriculum.

Second Year - General Agriculture

ILOs

1. Assists students to know themselves (through application, differentiation, synthesis and some judgement).
2. Develops desirable personal habits and skills in interpersonal relationships.
3. To acquaint students with the field of agriculture and its relationship with other fields.
4. To help students develop an appreciation for agriculture, its importance and some basic agricultural tools.

Content

I. Values, attitudes and goals.

A. what they are;

B. how they are developed;

C. differences in values, attitudes and goals:

1. from one person to another;
2. society to another society

D. respect for other value systems.

II. Elements of team work

A. what is team work?

1. its advantages
2. its disadvantages

B. temperament

1. co-operation
2. sympathy
3. caring for others

III. What agriculture is:

A. brief history and introduction

B. agricultural developments, from

1. traditional agriculture
2. to improved agricultural method
3. mechanized agriculture

IV. Importance of agriculture to:

A. the individual

B. his family

C. community

D. state

E. country

These should be taught through: 1) food; 2) economy 3) skills (occupational).

V. Basic tools used in agriculture:

A. hoe;

B. plough;

C. sickle;

D. matchete;

E. ox-plough; etc.

Each should be taught by using the following topics: 1) meaning and use; 2) names of parts; 3) advantages and disadvantages of using it.

VI. Opportunities in agriculture

A. career opportunities in agriculture

B. where to find information on jobs

C. requirements in any of the occupations

VII. Relationship between general and agricultural education

Reviewer's Comments. The two reviewers did not make any comments on the second year of the six-year vocational agriculture program.

Researcher's Response. The proposed curriculum and the second year of the six-year vocational agricultural program will be left intact.

Third Year - Introduction to Vocational Agriculture (General Overview)

ILOs

1. Develop students' understanding, knowledge and appreciation of the importance of vocational agriculture to the society.
2. Introduce the students to the major areas or parts of vocational agriculture.
3. At the completion of this course, the student should have the understanding, knowledge and basic skills necessary for any of the major parts of vocational agriculture.
4. Students will become aware of the major occupations and career opportunities that are associated with vocational agriculture, as well as the development of leadership

qualities in vocational agriculture.

Content

I. Review of second year's work

II. Concept of vocational agriculture

A. what it is

1. how it developed out of agriculture

B. the importance of vocational agriculture to

1. the individual
2. the life of the society both educational, political, social and economic.

III. Introduction to major areas of vocational agriculture, namely: agricultural mechanics, animal technology, crop/plant technology, soil technology and agri-business and management.

A. Agricultural Mechanics--introduction:

1. meaning
2. job opportunities
3. job requirements
4. tools used - both hand and power tools
5. areas in agricultural mechanics - welding, metalwork, woodworking, building, electricity, machinery, and irrigation.

B. Animal Technology -- introduction:

1. meaning
2. areas - dairy, beef, swine, sheep, poultry, etc.
3. job opportunities
4. job requirements.

C. Crop/Plant Technology -- introduction:

1. meaning
2. career opportunities in crop/plant technology
3. job requirements
4. basic plant science
5. areas of crop/plant technology - horticulture and forestry.

D. Soil Technology -- introduction:

1. meaning
2. the importance of soil technology
3. different soils and fertilizers
4. job opportunities
5. job requirements

E. Agri-business:

1. meaning
2. importance of agri-business
3. areas - occupations, management, accounting, etc.
4. agricultural products - marketing and recording
5. advertising, etc.
6. careers.

Reviewers' Comments. Reviewer II put a question mark and commented at the end of ILO number 3. The comment that was made was "at this young age." ILO number 3 reads:

> At the completion of this course, the student should have the understanding, knowledge and basic skills necessary for any of the major parts of vocational agriculture.

Because this intended learning outcome is part of the mosaic on which the ILOs for the fourth, fifth and sixth years of the program are built this ILO will remain.

On the inclusion in the third year of job opportunities and job requirements as one of the parts of the major areas of vocational agriculture, Reviewer I remarked: "I wonder if this is a good place to talk about job requirements." It was the contention of Reviewer I that by deleting job requirement from the third year, students would have more time to learn about the five major areas that make up vocational agriculture before learning about jobs that each area provides.

The researcher accepts both these comments and rationale given by the reviewer. Because of this job opportunities and job requirements will be moved to the fourth and subsequent years.

Fourth Year - Vocational Agriculture I

ILOs

1. To develop skills and competencies in any three of the five major sections of vocational agriculture.
2. Students will develop an understanding of the interrelationship between agricultural mechanics, animal technology, crop/plant technology, soil technology, and agribusiness.
3. To develop safe working habits while in the shop, be it in school or at home.

Content

I. Agricultural Mechanics

A. Meaning and its history

B. Farming and shop safety

1. shop rules and shop safety
2. using safety precautions - farm accidents and their causes, how to prevent fires, etc.
3. machinery safety - names, operations and care
4. power tool safety - how they operate, care and names.

C. Hand tools, e.g. cutlasses, hoes, forks, mattock, trowels, shears, secateurs, chain measurer

1. selections, names, uses and functions
2. proper care of hand tools
3. hand tools safety
4. common types of hand tools - file, hacksaw, chisels, reamers, measuring tools, hammers, woodboring tools, etc.

D. Machine tools -- introduction:

1. power drill
2. power saw } name of parts, uses and safety rules
3. lathe

E. Cold metal work: sheet metal - layout, cutting, bending, jointing and sawing

F. Arc and gas welding

1. history
2. uses
3. equipment and flames
4. safety
5. welding (practical)

Commenting on the provision in the curriculum content at the fourth year to teach machine tools and arc welding, Reviewer I asked, "how many places have electricity {in Nigeria}?" This was a reasonable comment for this reviewer to make because at the time the reviewer was in Nigeria, not many cities, let alone rural areas had electricity; however, in the last decade the Nigerian governments (both state and federal) have made a concerted effort to provide both pipe borne water as well as electricity to both urban and rural areas. Most of the present secondary schools in Kano State have a technical department with shops and laboratories in which machine tools such as power drills, power saws and small engine lathes are provided. Because electrical power is available in these schools to meet the electrical power

requirement of these machines, the decision was made to reject this reviewer's comment and to retain arc welding and machine tools as part of the curriculum content.

G. career opportunities in agricultural mechanics.

H. reading of blueprint and preparing bill of materials

1. importance of being able to read blueprint and make simple sketches
2. instruments used.

Reviewer I commented on the provision of blueprint reading as part of the curriculum content by asking "how important is this to a high school student?"

The researcher takes the position that blueprint reading is important not only to a high school student but also to any layman. Without a working knowledge of this graphic form of communication, both are hampered. Students are expected to initiate some projects or solve a given problem that needs this language of communication. Because of these needs the author made the decision that blueprint reading remain as part of the curriculum content, and move it to the fifth year.

I. Selecting and using nails, screws, bolts, hardware and glue.

No comments from either Reviewer I or Reviewer II. This curriculum content will remain in the fourth year phase of the vocational agriculture program.

II. Animal Technology

A. farm animals - purposes of their production

1. types of animals and uses
2. feeds and feeding
3. diseases and their control
4. common problems in breeding livestock

B. Areas in animal technology

1. beef production: classes of beef cattle producers; breeds and breed selection; fitting and showing beef cattle
2. dairy: importance of dairy to human nutrition; selecting a breed for dairy; fitting and showing dairy cattle
3. poultry: selecting a breed; poultry records; poultry and egg shows
4. sheep and goats: classes and breeds; fitting and showing
5. swine: breeds of swine; fitting and showing
6. Opportunities in beef production, dairy production, poultry production, sheep and goats production and swine production. Job available and requirements.

The curriculum content of the fourth year, under II) Animal Technology includes animal fitting and showing as concepts to be taught. On this Reviewer I pointed out that "animal shows are not {important}."

The researcher disagrees with this comment because of the fact that there are annual agricultural shows in most parts of Kano State. These shows provide the farmers the opportunity to compete in all aspects of agriculture. Therefore, animal fitting and showing will remain as part of the recommended curriculum content.

III. Crop/Plant Technology

A. Basic plant science

1. seed germination
2. nutrient intake and translocation

3. major crop areas in Nigeria, Kano State and the local community
4. relationship of crops and their environment
5. economic importance and uses of farm crops
6. crop improvement
7. identification of crops
8. weeds - identification and eradication
9. insects
10. crop diseases

B. Opportunities in plant/crop production

IV. Soil Technology

A. Soil formation and classification

1. importance of our soil and its management
2. origin of soil
3. chemical nature of the soils
4. physical nature of soils
5. animal life and the soil
6. plant life and the soil
7. water and the soil

V. Agri-business

A. Introduction to agri-business

B. Opportunities and careers in agriculture

C. Farm management

1. record keeping
2. farm analysis
3. cost analysis application
4. inventory and balance sheet
5. job application
6. agricultural accounting.

"Who will teach the course?" "Teachers' availability?" were the questions asked by Reviewer II on the provision of curriculum materials for the five major areas of vocational agriculture.

The researcher believes that these are central and very important questions if the program is to be a success. On the question of teaching staff, see recommendations under

teaching staff.

Fifth Year Vocational Agriculture II

ILOs

1. Students will be able to intelligently select the appropriate materials needed for a particular project in agriculture.
2. Develop skills in planning and executing a project in agriculture.
3. Students will be able to analyze a given problem and synthesize and originate solutions.

Content

I. Agricultural Mechanics

A. Farming and shop safety continues

B. Cold metal, drills and drilling, shearing and cutting threads

C. Hot metal work

1. structures of metal
2. uses of metal
3. bending
4. hardening
5. annealing
6. tempering

D. Gas and arc welding

1. cutting
2. brazing
3. leaning and arc welding - flat position, T-welds, butt welds, vertical welds, horizontal welds

E. Farm machinery

1. farming machinery (the ones available in the local area the school is situated in) maintenance and care
2. lubrication
3. fuels
4. adjusting belts and chains
5. power take offs
6. safety and correct operator procedures

F. Building construction

G. Reading of blueprint

H. Small engines

1. inspection
2. principles and operation
3. carburetion
4. ignition
5. compression
6. bearings
7. overhaul
8. adjusting
9. painting
10. maintenance

I. Electricity

1. codes, terms and use
2. splices, housewiring
3. cleaning and servicing motors

"How common is arc welding?" "No way!" were some of the comments of Reviewer I on the inclusion of either arc welding or electricity in the vocational agriculture curriculum. This is interrelated with the assumption held by this Reviewer on the availability of electricity in Nigeria. For arc welding, the researcher accepts that it should be made optional; where the equipment and resources are available it should be taught. The content of electricity will change from the following:

I. Electricity

1. codes, terms and use
2. splices, housewiring
3. cleaning and servicing motors

to:

I. Electricity: science of electricity

1. what is the meaning of electricity?
2. some simple terms used in electricity
3. importance of electricity to human beings
4. how electricity is produced
5. simple cells and how they work
6. conductors, resistors, etc.
7. parallel and series wiring
8. other simple electrical concepts.

II. Animal Technology

A. Animals and their names and uses of their parts

B. Feeds and feeding. Use of main animal feedstuffs, e.g. palm kernel meal, blood meal, bone meal, maize, guinea corn, groundnut cake fish meals.

1. forage crops - guinea grass, elephant grass, giant star grass, andropogon, etc.
2. classes of nutrients, feeding cattle for beef, dairy, swine, sheep and poultry
3. how to store animal feeds

C. Beef production

1. cross breeding
2. performance testing
3. pasturing
4. reproduction problems
5. disease control - nature and causes of disease, detecting disease, use of drugs.

D. Dairy production

1. feeds and feeding
2. sanitation
3. managing the cow herd
4. milking procedures
5. housing and equipment
6. management and care of young stock

7. cow pools
8. grade A requirements
9. care of milk after it is obtained

E. Poultry production

1. feeding and managing the laying flock
2. diseases and parasites
3. marketing poultry products
4. controlled environment for top egg production
5. housing
6. care of eggs after production

F. Sheep and goats production

1. feeding and managing the breeding flock
2. production testing
3. marketing
4. parasites of sheep and goats

G. Swine production

1. feeding and managing of breeding stock
2. feeding and managing of market hogs
3. producing "meat type" hogs
4. breeding profitable market hogs

H. Opportunities in animal technology

I. Horse

1. selection and care
2. feeding

III. Crop/Plant Technology

A. Horticulture - all its facets

B. Forestry - introduction, importance, etc.

C. Corn, millet and sorgham production

D. Cash crops production

E. Rhizomes, tubers, bulbs and corns

F. Plant insects, diseases and their control, e.g. smut of cereals, maize-rust, swollen shoot of cocoa, mosaic of cassava, rosette and leaf-spot of ground-nut, nematodes of crops, etc.

G. Chemicals - insecticides, pesticides, herbicides, etc.

The teaching of chemicals such as insecticides, pesticides, etc. was not encouraged by Reviewer I, who suggested the teaching of "better management practices to keep down chemical use!" This point is taken and the teaching of cultural practices will be incorporated into the curriculum, in addition to the teaching of the basics of chemicals used in agriculture.

Section G) Chemicals will change to:

G. cultural practices and chemicals

1. what cultural practices are?
2. advantages of cultural practices over chemical use
3. common chemicals and their uses, e.g. insecticides, pesticides, etc.

H. Opportunities in plant/crop technology

IV. Soil Technology

A. Minerals in the soil

B. Commercial fertilizers

C. Farm manure

D. Land judging

E. Soil tests

F. Soil conservation

G. Opportunities in soil technology

V. Agri-business

A. Legal forms of business

B. Agricultural products and prices

C. Legal description of home farms; traditional land

tenure systems

D. Study of land description

E. Farm accounting and record keeping

F. Use of credit for production and marketing

G. Taxes and insurance

H. Advertising and public relations

On the provision of advertising and public relations Reviewer I vehemently opposed such provision with an emphatic "No!"

The researcher was convinced that such provision may not be necessary, in which case this curriculum content was deleted.

Sixth Year - Vocational Agriculture III

ILOs

1. To develop students' skills necessary for effective development of farm and non-farm projects.
2. To help students develop skills that will enable them to objectively and intelligently address issues that concern agriculture.
3. To develop leadership quality in students.

Content

I. Agricultural Mechanics

A. Safety precautions

B. Farm machinery

1. tractor - operations, maintenance and care
2. corn planters, farm sprayers, forage and grain cutting machines - operations, safe use, maintenance and care

C. Plumbing

D. Inert gas welding

E. Arc welding (advanced)

F. Planning and developing a home shop and selecting tools

G. Electricity

H. Surveying and mapping

I. Drainage and irrigation

J. Building construction

II. Animal Technology

A. Review of what was learned in previous years

B. Beef production and management

1. selecting and establishing the breeding herd
2. selection of feeder cattle
3. feeds and feed utilization by beef cattle
4. feeding and management of stockers and fattening cattle
5. food nutrients
6. digestion, absorption and use of food
7. measuring the usefulness of feeds
8. breeding herd through genetic improvement

C. Dairy Production

1. dairy products - milk, cheese, ice cream, butter and other manufactured products
2. housing and equipment
3. keeping cattle healthy
4. nutrient requirements and how to furnish these in a dairy diet
5. testing good dairy products
6. opportunities in dairy production

D. Poultry

1. opportunities in poultry production
2. breeds and classes
3. brooding, feeding, egg structure and grading
4. turkeys, ducks and fowl
5. poultry judging

E. Sheep/Goat Production

1. opportunities in sheep/goat production
2. selection and judging breeds
3. care
4. castrating and docking

F. Swine Production

1. breeds, crossbred hogs
2. selection and judging
3. pasture crops for swine
4. care of sow and litter
5. diseases and parasites
6. opportunities in swine production

G. Other Animals - care and management of horses, dogs, cats, rabbits, guinea-pigs and donkeys as well as camels.

III. Soil Technology

A. Determining soil fertility

B. Commercial fertilizers

C. Use of lime

D. Organic matter

E. Soil conserving practices

F. Soil erosion

G. Irrigation

H. Soils and field crop industry and career opportunities

I. Soils evaluation and use

V. Crop/Plant Technology

A. Horticulture

B. Forestry

C. Cereal crops - wheat, oats, barley, corn, sorghams, millet and rice

D. Weeds - perennials, annuals, biennials, noxious and poisonous weeds, eradicating weeds

E. Forage crops

1. kinds of forage
2. raising legumes
3. raising grasses
4. establishing pastures

F. Vegetable crops

V. Agri-business

A. Farm management

B. Income tax

C. Farm management agriculture mathematics

D. Farm laws

E. Tenancy and farm leases

F. Hazards and insurance

G. Farm opportunities and cooperations

H. Government programs

I. Living in today's world

J. Opportunities in agri-business

K. Marketing farm products

L. How to complete application forms.

Reviewers' General Comments. After going through the whole curriculum content that was developed for secondary schools of Kano State, Nigeria as a result of the study,

Reviewer I has this to say on the overall viability, desirability, worthwhileness and relevance of the content to the Nigerian situation: "On the whole you {the researcher} have a lot of good ideas and with a few changes this section would be very good {to the Nigerian situation}." Reviewer II summarized his reaction thus: "In general I think you are developing a model for a very important component of the curriculum {of general education} to be offered in the secondary schools in Kano State, Nigeria." He went on to explain how "commendable" this objective is and believes that "the fulfillment of this objective is certainly desirable" but cautioned that "is it achievable?" This concern of whether or not the objective is achievable by Reviewer II stemmed from skepticism in that the vocational agriculture curriculum "may be difficult to gain acceptance . . . along with the other general education courses now included in the curriculum." The researcher is aware of such difficulty, but believes that if initiative and action is not taken to dissipate the negative attitude towards anything but academic, vocational education may never be accepted as another discipline that complements general education. Because of this, the objective certainly is achievable! Reviewer II also appreciates the need to have a comprehensive system of secondary education when he noted that:

> The inclusion of vocational agricultural education in the general education structure for secondary schools in Kano State is a commendable objective. Agricultural production is a major component of the State's general economy to the extent that Kano State is

> commonly referred to as being the Agricultural State in Nigeria. There is a need throughout Nigeria to impart a greater acceptance for the role of agriculture for its own importance and as a profession which is attractive and rewarding.

The major weakness of the curriculum content was pointed out by Reviewer I when he commented, "I think the major point you fail on is that vocational agriculture students will probably work in government job{s} helping subsistence farmers. If this is not true then electricity, tractors, etc. are important." This point was considered in addition to the future outlook of Nigerian agriculture to move out of the subsistence level when the vocational agriculture curriculum was being developed.

The most apparent and major concern of the Reviewers was the provision of teaching staff and facilities to teach the five major areas of vocational agriculture, namely: agricultural mechanics, animal technology, crop/plant technology, soil technology and agri-business. On this aspect, Reviewer II commented:

> I am concerned that secondary schools generally may have difficulty obtaining either the number of staff or staff with qualifications required to carry out the instruction satisfactorily . . . .
>
> The availability of options to permit students to select two areas in year 5 and one area in year 6 suggests that instruction in all five major areas may be offered simultaneously. This would be quite impossible if only one agriculture teacher were available in the school . . . .
>
> In-depth teaching of subject areas as suggested in years 5 and 6 will require laboratories for part of the instruction. These laboratories may not be available or may be only poorly equipped in the general secondary schools.

This prompted Reviewer II to suggest that a separate vocational agricultural school be established. He remarked that:

> Successful implementation of the fourth, fifth and sixth years in a general secondary school system will present difficulties. I think consideration should be given to offering this in-depth vocational agricultural education in separate vocational agricultural schools. This approach will permit the provision of well equipped laboratories and the availability of well qualified staff for instruction.

All the above concerns are real and deserve serious consideration by the researcher. These considerations will be used as a guide for recommendations of appropriate measures that will help to alleviate these problems. On the suggestion that separate vocational agricultural schools be provided for the suggested vocational agriculture curriculum, the researcher totally disagrees with this view, as it will jeopardize one of the major goals of the program, which is: the vocational agriculture program is to help students integrate, reinforce and apply the academic disciplines.

Furthermore, to offer this program in a separate school will implicitly denote "educational apartheid" and will further alienate practical (applied) education from theoretical education. This is also equivalent to the preservation of the well known prejudice against vocational education -- that it is "inferior" to academic education. The researcher did not accept this suggestion and is of the view that the vocational agriculture program integrated with general education will help strengthen the relation between

the two aspects of education.

By and large, both Reviewers were very enthusiastic about the program and hoped that it will be implemented as pointed out by Reviewer II in this way:

> You are doing good work and I am sure that any components of your proposal that can be implemented in the secondary schools of Kano State will be very beneficial to the general economic advancement of the State.

CHAPTER V

SUMMARY, FINDINGS, OBSERVATIONS, CONCLUSIONS, AND RECOMMENDATIONS

Included as the content of Chapter IV was a paradigm of secondary education for Kano State which illustrated the integration of General Education and Vocational Agriculture. Closely related to this paradigm is the curriculum model that was developed from this study. In the last chapter each component of that model was completed using the results of the research. A major part of the content of that chapter was the results of the two consultants who reviewed the proposal curriculum that was developed from the study. The comments of these reviewers were used to make modifications to the proposed curriculum to revise it in its final form as the recommended curriculum and was fitted into the content component of the curriculum model.

The final chapter of this thesis is divided into three sections. The first section deals with the summary of the problem, the review of the literature and the research methodology. Section two outlines the findings of the study, with observations and conclusions that resulted from the research. Recommendations to the authorities in the Ministry of Education, Kano State, Nigeria form the content of the last section of the chapter.

Summary

The following is the summary of the problem, related literature and the research methodology that was used in the investigation.

Identification of the Problem

The problem that prompted this research was the decline in agricultural production (especially food) in Kano State in particular and Nigeria in general. The researcher believes that the Nigerian government (both state and federal) have taken various measures to help alleviate this problem, however, education (particularly vocational education at the secondary level) was not given the priority it deserves as one of the possible solutions for the decline of agricultural production.

Purpose of the Study

The purpose of the study was to review and perform a content analysis of existing programs of studies in vocational agriculture that were offered in selected high schools in the Mountain Plains Region of the United States of America, and from this analysis develop a model vocational agriculture curriculum for the secondary schools of Kano State, Nigeria.

To achieve the purpose of this study, the following objectives were established. The general objective of this study was to develop a model curriculum of vocational

agriculture for the secondary schools of Kano State, Nigeria. The supporting objectives of this study were: to review the secondary vocational agriculture programs from selected high schools from the Mountain Plains Region of the United States of America that meet the criteria established for selecting these schools; to identify the major curriculum components of the programs, course outlines, course descriptions, curriculum guides, or syllabi for vocational agriculture that are received from participating schools; to determine the scope of the vocational agriculture programs that are offered in the secondary schools that were involved in the research; and to determine the sequence of courses that comprise the vocational agriculture curricula that are offered in the secondary schools that made up the population of this study.

Related Literature

An overview of Nigeria in general and Kano State in particular was given, which included an overview of the educational system of Nigeria and Kano State, with emphasis on secondary education in that state. It was found that no vocational agriculture curriculum per se existed in the secondary schools of Kano State, although an agricultural science syllabus had been developed by the West African Examinations Council (W.A.E.C.) for secondary school students. A major weakness of that agricultural science syllabus is that it is based on theoretical knowledge rather than

practical or applied knowledge.

The works of curriculum specialists, practitioners, theorists and model builders were reviewed and analyzed to establish a definition of the term "curriculum," as well as to identify the elements or components that make up a curriculum. This review and analysis helped the researcher develop a curriculum model for the study (Figure 10).

Research studies that were conducted on vocational agriculture at the secondary school level and that had implications for this study were reviewed. One of the findings of a research conducted by Okorie (1974) confirmed the lack of government attention in Nigeria to vocational agriculture at the secondary school level.

Methodology

This study had two populations that were involved in the research. The first population consisted of personnel who held administrative positions in vocational agriculture in the state departments of education located in the Mountain Plains Region of the United States, which included the states of: Colorado, Iowa, Kansas, Minnesota, Nebraska, North Dakota, South Dakota, Utah and Wyoming. The role of the state supervisors in the study was to help the researcher identify the schools and their principals in their state that offer a program in vocational agriculture. The second population for this study included the principals of all the secondary schools in the Mountain Plains Region

where a program in vocational agriculture was offered.

From the second population, a random sample was selected using a table of random numbers until a sample of 50 percent of the schools that met the following criteria established for the study were selected. These criteria were that: the school should enroll at least 500 students in its programs; the school must offer an articulated program of vocational agriculture that includes courses that are offered in grades 10, 11 and 12; the school must employ at least two vocational agriculture teachers; and the service area (county) which the school serves must have a population base larger than 25,000 inhabitants. This procedure yielded 35 schools. A letter was prepared and sent to the administrators or principals of the selected schools asking them to co-operate in the study by furnishing the researcher with any of the following curriculum materials: a curriculum guide; a course description; a course outline; a program of study; or a syllabus for vocational agriculture.

Of the 35 letters that were mailed, 18 (51.4%) replies were received. For those participants who did not meet the deadline date, a follow-up letter was prepared and mailed. This yielded one additional reply, making the total number of replies received 19 (54.2%) Of these 19 responses, two were unusable because one letter was returned because the vocational agriculture teacher was no longer at the school, and in one school the vocational agriculture program was offered at the post-secondary school level only.

The curriculum guides (4), programs of studies (1), course of study (3), course outlines (4), course descriptions (5) that were received from participants were reviewed and analyzed to determine if they included the curriculum components that were identified from the review of writings of authorities on curriculum. Another purpose of this analysis was to determine if there was articulation of the curriculum content with other academic disciplines such as mathematics and science, both physical and natural sciences.

From the review and analysis of these curriculum materials, a vocational agriculture curriculum was developed. To ascertain if this curriculum content had reliability, validity, worthwhileness and appropriateness, it was placed in the hands of agricultural specialists who were in Nigeria under the auspices of the Canadian International Development Agency (CIDA). These reviewers were asked to review, analyze, and criticize the proposed curriculum. The comments made by these reviewers for modifying the curriculum content were incorporated into the recommended curriculum for the curriculum model that was designed for this study.

Research Findings

The following findings were generated from the content review and analysis of the research data (curriculum materials) that were received from schools that participated in the study. Each curriculum component is treated separately.

Philosophical Statement

Data from the research conducted revealed that approximately 18 percent of the curriculum materials contain a philosophical statement.

Aims, Goals and Objectives

The findings of the study indicated that 82% of the curriculum documents that were analyzed included aims, goals or objectives for the course for which they were written.

Content

The review and analysis of the 17 curriculum materials that were received showed that 100% of these materials contain curriculum content.

Learning Experiences

Data from the analyzed curriculum materials of participating schools revealed that approximately 59% of these materials contain learning experiences.

Evaluation

The findings from the study indicated that 12% of the 17 curriculum materials reviewed included some scheme of evaluation.

Observation

As a result of the findings of the study, the following observations were made. Out of the five curriculum components identified, it was observed that both the philosophical statement and evaluation scheme were given less emphasis by curriculum developers, especially at the school district and school level where these materials were written. Out of the 17 curriculum materials whose content were analyzed, only three included a statement of philosophy and two some schemes for evaluating student performance.

It was also observed that some curriculum materials that did not contain aims, goals or objectives statement did, however, contain curriculum content. Another interesting observation to the researcher that was drawn from the findings of the study was that all the curriculum documents that contained a philosophical statement for vocational agriculture did not include any scheme of evaluation, similarly all the materials that included some scheme of evaluation did not include a philosophical statement for vocational agriculture.

It was further observed that some personnel in charge of vocational agriculture at the state department of education did not co-operate with the researcher by either responding to the researcher's correspondence or sending the requested materials. This same observation was made concerning the type of co-operation that some school principals selected to participate in the study gave to the researcher.

Out of the nine states that form the Mountain Plains Region of the United States, only three were involved in the study.

The observation was made that the curriculum materials that were analyzed covered the scope for the foundation for entry level skills in vocational agriculture and that these foundational skills, knowledges, and understandings were properly sequenced. A related observation that was made was that in some of the curriculum materials that were analyzed the academic disciplines of physics, biology, chemistry, mathematics and other academic subjects such as English and social studies were being reinforced in the vocational agriculture courses.

Conclusions

On the basis of the findings of the study, the following conclusions were drawn.

Generally, curricula developed at the school district level did not contain a statement of philosophy. It might be assumed that the reason for the omission of a philosophical statement from these documents is that it is included in other publications of the local or district school board.

Almost in all curriculum materials the terms aim, goal, and objective were used as synonyms. This is apparent from statements of aims which were used more as statements of objectives and statements of objectives which were used more as statements of goals.

In general, all curriculum materials that were part of this study contained content. The reason could be because of the perceived synonymous relationship attached to the term "curriculum" to content by some curriculum developers.

One of the weakest of the identified components of the curriculum materials involved in this study was the evaluation component. Without a scheme for evaluating student performance the teacher has no knowledge of how well the student has learned or how well the teacher has taught. The scheme for evaluation may have been known to the teachers and to the students of participating schools, but this scheme was not part of the printed materials of those received from these schools. On the finding of a research conducted by Langenbach (1971) cited in Beauchamp's book Curriculum Theory, 1975, Beauchamp has this to say on the lack of evaluation scheme in curriculum guides:

> Rarely do curriculums contain evaluation schemes or specific implementation instructions. The former probably reflects our artlessness about evaluation in general and about curriculum in particular. (p. 126)

Recommendations

Although the following recommendations are not based on research findings they are directed toward the authorities in Kano State Ministry of Education for their considerations. (The recommendations are not given in order of importance or preference.)

Teaching Staff

For the successful implementation of any innovative curriculum the teaching staff should be made aware of all the facets of such curriculum. It is recommended that teachers to be involved in the instruction of this curriculum should be given orientation to the entire vocational agriculture curriculum including its conceptual framework, rationale, aims, goals and objectives as well as its content.

It is further recommended that the gualification of the teachers to instruct the curriculum should hold either a National Certificate in Education (N.C.E.) or a baccalaureate with industrial experience in farming or in an agro-allied industry.

Another recommendation is that teachers of the vocational agriculture program should from time to time attend refresher courses to upgrade their skills and knowledge and make them aware of current developments in agriculture. The refresher course could be arranged by either the Ministry of Education in co-operation with the Ministry of Agriculture or vice versa.

It is recommended that for the initial implementation of the vocational agriculture curriculum and due to lack of gualified teachers, professionals from each occupational area or major fields of agriculture be engaged to teach on an interim basis. The best students who gr[illegible] from this program may also be engaged to teach it on[illegible]

after completing an intensive course on teaching methods and later securing the necessary qualifications for certification.

Resources and Facilities

It is a common knowledge among educators that vocational education is an expensive instructional program. Because of this, it is recommended that this program be cost shared by the Federal and State governments, the private sector and parents. A suggested scheme for this cost sharing is that the Federal Government provide 40% of the costs, Kano State Government should provide 40% of these costs, with the private sector paying 15% and the parents the remaining 5% of the total costs.

It is recommended that the laboratories and the workshops in secondary schools where this program is offered be built according to accepted standards. Parents should be encouraged to allow their farms to be used by agricultural students. Farmers' co-operative associations should be formed and involved in the program.

Implementation

It is recommended that the recommended vocational agriculture curriculum be implemented on an experimental basis in a rural school where laboratories and workshops are available and with students who will complete the six year program.

It is recommended that a follow-up study be made of these students to ascertain the usefulness, viability, success or failure of the program, as well as its strengths and weaknesses. This will help Ministry officials to decide whether or not to continue the program, modify it, or abandon it.

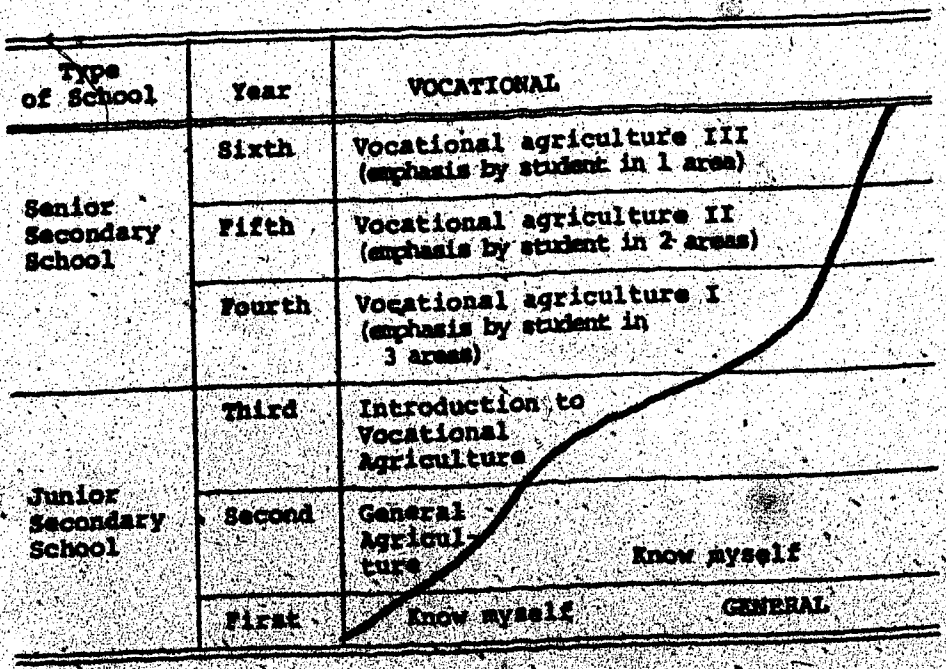
Recommended Curriculum Paradigm and Content

The following are the recommended curriculum paradigm and content of the vocational agriculture curriculum for the secondary schools of Kano State, Nigeria.

Curriculum Paradigm

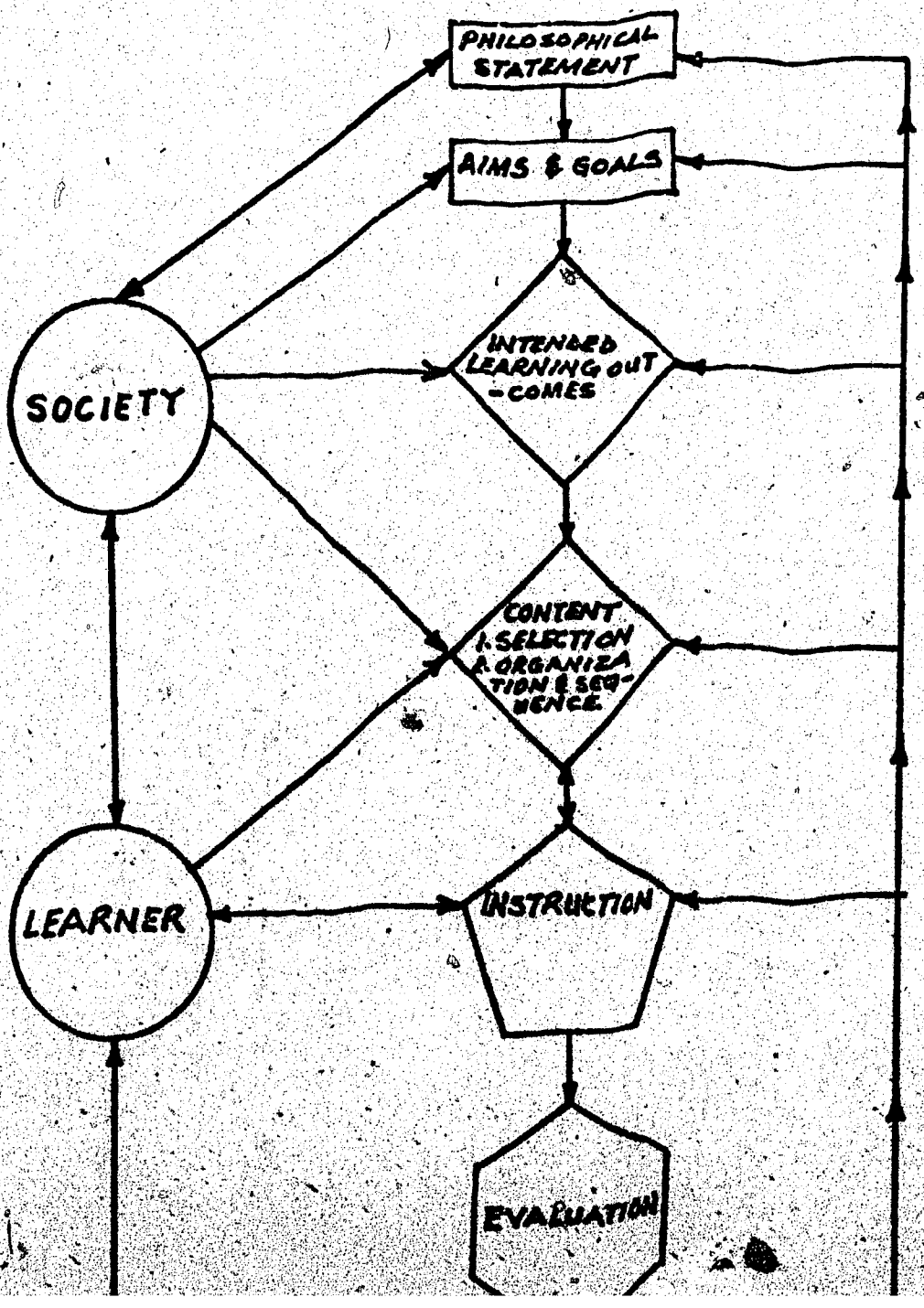
Figure 11

A Paradigm Showing Relationship of Vocational Agriculture to General Education Curriculum at the Secondary School Level



Recommended Curriculum Content for Vocational Agriculture Curriculum

The following is the total recommended Vocational Agriculture curriculum for secondary schools of Kano State, Nigeria, which is based on the paradigm and is fitted into the curriculum model of the study.



Philosophical Statement. Educational policy in Nigeria is the responsibility of the Federal Government; because of this, it will be unwise to deviate and create a separate philosophy of education. Therefore the philosophy of Nigerian education as outlined in the National Policy on Education (1977) was adopted, and is thus:

> Nigeria'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 of the nation at the primary, secondary and tertiary levels, both inside and outside the formal school system. . . .
>
> Nigeria should be a free, just and democratic society, a land full of opportunities for all its citizens, able to generate a great and dynamic economy, and growing into a united, strong and self-reliant nation . . . . (pp. 4-5)

Aims of the Program. It will be recalled from Chapter II that aims, goals and objectives are used synonymously for the purpose of this study. This program is to be integrated into the general structure of the secondary education in Nigeria, which has the following broad aims:

> 1. Preparation {of students} for useful living within the society; and
> 2. Preparation for higher education.
> (p. 10)

The following are some of the more specific aims of secondary education as outlined in the National Policy on Education (1977):

> a. Provide an increasing number of primary school pupils with the opportunity for education of a higher quality, irrespective of sex, or social, religious, and ethnic background;

b. Diversify its curriculum to cater for the differences in talents, opportunities and roles possessed by or open to students after their secondary school course;
c. equip students to live effectively in our modern age of science and technology; and
d. raise a generation of people who can think for themselves, respect the views of and feelings of others, respect the dignity of labour, and appreciate those values specified under our broad national aims, and live as good citizens. (p. 10)

Added to the above secondary education aims, the vocational agriculture curriculum has the following general objectives which were developed from the research:

1. To help students integrate, reinforce and apply the academic disciplines.
2. To meet the needs, interests and abilities of those students who, upon graduation, will enter a college of higher learning.
3. To expose students to a comprehensive representation of the technologies in agriculture and their effect on human life, as well as the "know-how," "why," "when," "where" and "what" of all aspects of agriculture.
4. To make students aware of the opportunities and intelligently plan career programs in agriculture requiring college or other types of education.
5. To prepare exploratory experiences to students who are avocationally inclined to agriculture.
6. To develop and apply personality traits, habits, attitudes, human relations, business management and leadership skills that are required for success in agricultural occupations.

7. To develop an appreciation for the intrinsic value of agricultural production in society.
8. To promote the need for and the practice of efficient farm product consumption.

The reaction of the members of examining committee was that the ILOs that were selected for each course of the curriculum show an integration of teacher centred and learner centred ILOs. It was the recommendation of the members of the committee that those ILOs that were written in teacher centred terms be revised so that these statement were student centred.

The ILOs that are found in the recommended curriculum reflect the recommendation made by the members of the examination committee.

First Year - Know Myself

It should be noted that this first year program of the entire vocational agriculture curriculum was developed not as a result of the study but because the author believes that it will serve as a guidance course that may help the student to know himself, his interest, abilities, etc. The knowledge of self could be used by the student to determine if his interest is in agriculture.

Intended Learning Outcomes (ILOs)

1. Students will be able to determine or become aware of what they are.
2. Helps students identify their interests and abilities.
3. Students to develop the sense of responsibility in one's actions.

Content

I. Individual differences - worth as an individual.
   A. I as a person
   B. My temperament, motivation, etc.

II. Interest - what is interest and how it develops.

III. Ability - meaning
   A. Awareness of capabilities and limitations.

IV. Health
   A. What it is
   B. How to keep healthy
   C. Healthy food, clothes and environment.

Learning Experiences

In order for students to effectively and meaningfully have a dialogue with the content, the following learning experiences are recommended. However, teachers are free to choose either from the following learning experiences or elsewhere the learning experiences that they think will have more effect on learning by students.

1. Interview with parents to ascertain initial behavior, abilities, interests, etc.
2. Students analyze themselves and also write a brief composition on "Who I think I am.".
3. Students, divided into small groups, listen to the members of the group analyze each member.
4. List of occupations that students are interested in.
5. Oral class presentation by students on any topic on personal habits.
6. A film show on how people live together.

Evaluation Guide

The following is an evaluation guide that could be used by teachers.

1. Students to state either orally or in writing the differences they noticed between their self concept prior to this phase of the vocational agriculture program and after this program.
2. A pre-test (on the concepts and principles to be learned) should be given to students before they start the course and a post-test after to find out if learning took place.
3. Instructional evaluation by students. This will help the teacher identify both his weaknesses and students' weaknesses.

Second Year - General Agriculture

ILOs

1. Students will be able to know themselves (through application, differentiation, synthesis and some judgement).
2. Develop desirable personal habits and skills in interpersonal relationships.
3. Students to get acquainted with the fi[illegible] agriculture and its relationship with other fields.
4. To help students develop an appreciation for agriculture, its importance and some basic agricultural tools.

Content

Content to be learned by students during this phase of the program includes:

A. Values, attitudes and goals

1. What are they?
2. How they are developed?
3. Differences in values, attitudes and goals from: (i) one person to another; (ii) family to family; and (iii) society to society.

B. Elements of team work

1. What is team work?
2. Team work's advantages and disadvantages
3. Techniques to develop team work ability--temperament, co-operation, sympathy and care for others.

C. General Agriculture

1. What agriculture is?
2. Brief history of agriculture and introduction
3. Agricultural developments in Kano State, Nigeria and the world.

D. Importance of agriculture to:

1. the individual;
2. his family;
3. community;
4. Kano State; and
5. Nigeria.

The above should be studied through: food (greatest emphasis here); with some emphasis on the economy; and skills (occupational).

E. Basic traditional tools used in agriculture in Kano State, and Nigeria:
   1. hoe
   2. plough
   3. sickle
   4. matchete
   5. cutlasses
   6. forks
   7. budding knives, etc.

F. Relationship between general and agricultural education.

H. Occupations in agriculture.

Learning Experiences

The following learning experiences are recommended for teaching the above content.

1. Case studies dealing with values, attitudes and goals of communities. Students to react either verbally or in writing to: the differences in values, attitudes and goals orientation of the various communities discussed; why there are such differences, etc.
2. Group discussion on present societal controversial issues that do have some implications on values, morals, etc.
3. Visit to "Sarkin Noma's" (farmer's head) farm, and an arrangement by the instructor for Sarkin Noma to give a brief speech on "Farming in Kano State: Past, Present and the Future."
4. Students in groups to visit various farmers and acquaint themselves with the method of farming, types of seeds, tools used and fertilizers.
5. Students to make a library or other field research on agricultural products of Kano State and Nigeria, the

uses these products are put to (e.g., human or animal consumption, used for agro-allied industries, etc.).

6. A small group presentation by students using either slides, overhead projector, pictures or writing on "what is agriculture?"

Evaluation Guide

It is recommended that students should be evaluated on the following:

1. Class participation;
2. How well student gets along with others in group work;
3. Presentation.

Third Year - Introduction to Vocational Agriculture (General Overview)

ILOs

1. Develop students' understanding, knowledge and appreciation of the importance of vocational agriculture to the society.
2. Introduce the students to the major areas or parts of vocational agriculture.
3. At the completion of this course, the student should have the understanding, knowledge and basic skills necessary for any of the major parts of vocational agriculture.
4. Students will become aware of the major occupations and career opportunities that are associated with vocational

agriculture, as well as the development of leadership qualities in vocational agriculture.

Content

Students are expected to learn the following content in the third year of the program.

I. Review of second year's work.

II. Concept of vocational agriculture:

1. what it is; how it developed out of agriculture;
2. its importance to the life of the society, both educational, political, social and economic.

III. Introduction to major areas of vocational agriculture, namely: agricultural mechanics, animal technology, crop/plant technology, soil technology and agri-business and management.

A. Agricultural Mechanics -- introduction:

1. meaning
2. importance of agricultural mechanics to agriculture
3. tools used in agricultural mechanics; both hand and power tools
4. areas in agricultural mechanics - welding, metalwork, woodwork, building, electricity, farm machinery and irrigation.

B. Animal Technology -- introduction:

1. what is animal technology?
2. importance of animal technology
3. areas of animal technology: dairy, beef, swine, sheep, poultry, etc.

C. Crop/Plant Technology -- introduction:

1. meaning
2. basic plant science
3. areas of crop/plant technology: horticulture and forestry.

D. Soil Technology -- introduction:

1. the meaning of soil technology
2. the importance of soil technology
3. different soils and fertilizers.

E. Agri-business -- introduction:

1. what is agri-business?
2. importance of agri-business
3. areas of agri-business: occupations, management, accounting, etc.
4. agricultural products - storage, marketing and recording.

Learning Experiences

For the teacher to impart the above content to the students, the following learning experiences are recommended.

1. Field trips - this should be emphasized, as the intent of this stage of the vocational agriculture program is to give the student the "feeling" of vocational agriculture; as such real life experiences should be provided to the students.
2. Interviews with workers on the jobs is recommended and should serve as follow-up of the field trips. Students either individually or in groups of two, whichever is more feasible, should conduct the interview and report back to the class. The field trip and interview will reveal if there is any disparity between what the workers do and what they say they do.
3. Introducing laboratory and workshop practices are recommended for this phase of the program.
4. Use of films, slides, filmstrip or transparencies to make students aware of the safety precautions and

safety procedures that are paramount in the shops and laboratories of the vocational agriculture program.

5. Pamphlets that are produced both by the Ministry of Agriculture and Natural Resources Kano State, and Ahmadu Bello University, Zaria, Nigeria on agriculture should be used as sources of reference. Other sources such as textbooks (Agboola's Agricultural Atlas of Nigeria, 1978) should be used.

Evaluation Guide

As this phase of the Vocational Agriculture curriculum is a continuation of giving the student a "feeling" of agriculture, and also serves as an introduction to the major areas of vocational agriculture, the following evaluation guide is recommended to be used by the instructor:

1. Written report;
2. Class presentation;
3. Oral examination;
4. Objective test; and
5. Practical projects.

Fourth Year - Vocational Agriculture I

ILOs

1. To develop skills and competencies in any three of the five major sections of vocational agriculture.
2. Students will develop an understanding of the interrelationship between agricultural mechanics, animal

technology, crop/plant technology, soil technology and agri-business.

3. To develop safe working habits while in the shop, be it in school or at home.

Content

In order to achieve the above ILOs, the following will constitute the content of this phase of the vocational agriculture program for the secondary schools of Kano State, Nigeria.

I. Agricultural Mechanics

A. Meaning, its history and importance to Kano State

B. Farming and shop safety

1. shop rules and shop safety
2. using safety precautions - farm accidents, their causes, and how to prevent fires, etc.
3. machinery safety - names, operations and care
4. power tool safety - how they operate, care and names.

C. Handtools, e.g. cutlasses, hoes, forks, mattocks, trowels, shears, secateurs, chain measurer, etc.

1. selections, names, uses and functions
2. proper care of handtools
3. handtools safety
4. common types of handtools - file, hacksaw, chisels, reamers, measuring tools, hammers, woodboring tools, etc.

D. Machine Tools -- introduction (where the machine tools are available):

1. power drill
2. power saw
3. small engine lathe

} name of parts, uses and safety rules

E. Cold metal work: sheet metal - layout, cutting, bending, jointing and sawing.

F. Arc (optional) and gas (mandatory) welding

1. meaning and history
2. uses
3. equipment and flames
4. safety
5. welding (practical)

G. Selecting and using nails, screws, bolts, hardware and glue.

H. Career opportunities in agricultural mechanics: job opportunities and requirements.

II. Animal Technology

A. Farm animals - purposes of their production

1. types of animals and uses
2. feeds and feeding
3. diseases and their control
4. common problems in breeding livestock.

B. Areas in animal technology

1. beef production: classes of beef cattle producers; breeds and breed selection; fitting and showing beef cattle
2. dairy: importance of dairy to human nutrition; selecting a breed for dairy; fitting and showing dairy cattle
3. poultry: selecting a breed; poultry records; poultry and egg shows
4. sheep and goats: classes and breeds; fitting and showing
5. swine: breeds of swine; fitting and showing
6. opportunities in beef production, dairy production, poultry production, sheep and goats production and swine production; jobs available and requirements.

III. Crop/Plant Technology

A. Basic plant science

1. seed germination
2. nutrient intake and translocation
3. major crop areas in the local community, Kano State and Nigeria
4. relationship of crops and their environment
5. economic importance and uses of farm crops
6. crop improvement
7. identification of crops

B. Opportunities in crop/plant production.

IV. Soil Technology

A. Soil formation and classification

1. importance of soil and its management
2. origin of soil, types of Kano State soil
3. chemical nature of soils (introduction)
4. physical nature of soils (introduction)
5. animal life and the soil
6. plant life and the soil
7. water and the soil.

B. Careers in soil technology.

V. Agri-Business

A. Introduction to agri-business

B. Farm management

1. simple record keeping
2. simple farm analysis
3. inventory and balance sheet

C. Opportunities and careers in agriculture.

Learning Experiences

Below are the learning experiences that are recommended for the fourth year Vocational Agriculture I.

1. Practice on safe habits, housekeeping and prevention of accidents. Practical use of tools in the shop.
2. Students to have a safety checklist, which they will use to evaluate the safety standard of the laboratory and shops in which they work.
3. Visits to an animal, and crop farms. Also visits to Ministry of Agriculture and Natural Resources to see laboratory soil tests.

4. It is recommended that teachers should use agricultural software produced by the extension services unit, Ahmadu Bello University, Zaria, Nigeria and those made by the Kano State Ministry of Agriculture and Natural Resources, as well as books written on Nigerian agriculture.

Evaluation Guide

The following evaluation guide scheme is recommended for Vocational Agriculture I:

1. Written report;
2. Oral class presentation;
3. Small projects undertaken in shops and laboratories;
4. Written examination.

Fifth Year -Vocational Agriculture II

ILOs

1. Students will be able to intelligently select the appropriate materials needed for a particular project in agriculture.
2. Develop skills in planning and executing a project in agriculture.
3. Students will be able to analyze a given problem and synthesize and originate solutions.

Content

For achieving the above ILOs, the following content should be presented to the students.

I. Agricultural Mechanics

A. Farming and shop safety continues

B. Cold metal - projects on cold metals through:

1. drills and drilling
2. shearing
3. cutting threads.

C. Hot metalwork

1. structures of metal - introduction
2. uses of metal
3. bending
4. hardening
5. annealing
6. tempering

D. Gas (mandatory) and arc (optional) welding

1. cutting
2. brazing
3. leaning and arc welding - flat position, T-welds, butt welds, vertical welds, horizontal welds.

E. Farm machinery

1. farming machinery (the ones available in the local area in which the school is situated
2. maintenance and care
3. safety and correct operation procedures
4. lubrication
5. fuels
6. adjusting belts and chains

F. Building construction

G. Reading of blueprints

H. Small engines

1. names and types
2. principles and operation
3. inspection
4. carburetion
5. ignition
6. compression
7. bearings
8. overhaul
9. adjusting
10. maintenance

I. Electricity: Science of

1. what is the meaning of electricity?
2. some simple terms used in electricity
3. importance of electricity to human beings
4. how electricity is produced
5. simple cells and how they work
6. conductors, resistors, etc. -- good and bad
7. parallel and series wiring
8. other simple electrical concepts.

II. Animal Technology

A. Animals and the names and uses of their parts

B. Feeds and feeding. Use of main animal feedstuffs, e.g. palm kernel meal, blood meal, bone meal, maize, guinea corn, groundnut cake fish meals.

1. forage crops - guinea grass, elephant grass, giant star grass, and ropogon, etc.
2. classes of nutrients, feeding cattle for beef, diary, swine, sheep and poultry
3. how to store animal feeds.

C. Beef production

1. cross breeding
2. performance testing
3. pasturing
4. reproduction problems
5. disease control - nature and causes of disease, detecting disease, use of drugs.

D. Dairy production

1. feeds and feeding
2. sanitation
3. managing the cow herd
4. milling procedures
5. housing and equipment
6. management and care of young stock
7. cow pools
8. grade A requirements
9. care of milk after it is obtained.

E. Poultry production

1. feeding and managing the laying flock
2. diseases and parasites
3. marketing poultry products
4. controlled environment for top egg production
5. housing
6. care of eggs after production.

F. Sheep and goat production

1. feeding and managing the breeding flock
2. production testing
3. marketing
4. parasites of sheep and goats.

G. Swine production

1. feeding and managing of breeding stock
2. feeding and managing of market hogs
3. producing "meat type" hogs
4. breeding profitable market hogs.

H. Opportunities in animal technology.

I. Horse

1. selection and care
2. feeding.

III. Crop/Plant Technology

A. Horticulture - all its facets.

B. Forestry - introduction, importance, etc.

C. Corn, millet and sorgham production.

D. Cash crops production.

E. Rhizomes, tubers, bulbs and corns.

F. Plant insects, diseases and their control, e.g. smut of cereals, maize-rust, swollen shoot of cocoa, mosaic of cassava, rosette and leaf-spot of groundnut, nematodes of crops, etc.

G. Cultural practices and chemicals

1. what are cultural practices?
2. advantages of cultural practices over the use of chemicals
3. common chemicals and their uses, e.g. insecticides, pesticides, herbicides, etc.

H. Opportunities in plant/crop technology.

IV. Soil Technology

A. Minerals in the soil.

B. Commercial fertilizers.

C. Farm manure.

D. Lang judging.

E. Soil tests.

F. Soil conservation.

G. Opportunities in soil technology.

V. Agri-business

A. Legal forms of business.

B. Agricultural products and prices.

C. Legal description of home farms; traditional land tenure systems in Kano State, and Nigeria.

D. Study of land description.

E. Farm accounting and record keeping.

F. Use of credit for production and marketing.

G. Taxes and insurance.

Learning Experiences

The following learning experiences are recommended in order for students to have a meaningful dialogue with the curriculum content of this phase of the program.

1. Projects to be carried out both on the farm and in the shops and laboratories.
2. Students to visit industries that have relevance to their areas of specialization.
3. Attend seminars and lectures on agriculture given by various agencies.
4. Agricultural filmshows, talks by management personnel and trips should form a major part of activities for this phase of the program.
5. Work experience and on-the-job training.

Evaluation Guide

Evaluation for Vocational Agriculture II should be mainly concerned with the development of skills and ability to find a solution to a given problem. Also to be evaluated is the procedure a student carries to execute a project.

Reports from industries where students are undertaking work experience should also be part of the evaluation scheme.

Sixth Year - Vocational Agriculture III

ILOs

1. To develop students' skills necessary for effective development of farm and non-farm projects.
2. To help students develop skills that will enable them to objectively and intelligently address issues that concern agriculture.
3. To develop leadership quality in students.

Content

I. Agricultural Mechanics

A. Safety precautions.

B. Farm machinery

1. tractor - operations, maintenance and care
2. corn planters, farm sprayers, forage and grain cutting machines - operations, safe use, maintenance and care.

C. Plumbing.

D. Inert gas welding.

E. Arc welding (advanced).

F. Planning and developing a home shop and selecting tools.

G. Electricity.

H. Surveying and mapping.

I. Drainage and irrigation.

J. Building construction.

II. Animal Technology

A. Review of what was learned in previous years.

B. Beef production and management

1. selecting and establishing the breeding herd
2. selection of feeder cattle
3. feeds and feed utilization by beef cattle
4. feeding and management of stockers and fattening cattle
5. food nutrients
6. digestion, absorption and use of food
7. measuring the usefulness of feeds
8. breeding herd through genetic improvement.

C. Dairy production

1. dairy products - milk, cheese, ice cream, butter and other manufactured products
2. housing and equipment
3. keeping cattle healthy
4. nutrient requirements and how to furnish these in a dairy diet
5. testing good dairy products
6. opportunities in dairy production.

D. Poultry

1. opportunities in poultry production
2. breeds and classes
3. brooding, feeding, egg structure and grading
4. turkeys, ducks and fowl
5. poultry judging.

E. Sheep/Goat production

1. opportunities in sheep/goat production
2. selection and judging breeds
3. care
4. castrating and docking.

F. Swine production

1. breeds, crossbred hogs
2. selection and judging
3. pasture crops for swine
4. care of sow and litter
5. diseases and parasites
6. opportunities in swine production

G. Other Animals - care and management of horses, dogs, cats, rabbits, guinea-pigs and donkeys as well as camels.

III. Soil Technology

A. Determining soil fertility.

B. Commercial fertilizers.

C. Use of lime.

D. Organic matter.

E. Soil conserving practices.

F. Soil erosion.

G. Irrigation.

H. Soils and field crop industry and career opportunities.

I. Soils evaluation and use.

IV. Crop/Plant Technology

A. Horticulture.

B. Forestry.

C. Cereal Crops - wheat, oats, barley, corn, sorghams, millet and rice.

D. Weeds - perennials, annuals, biennials, noxious and poisonous weeds; eradicating weeds.

E. Forage crops

1. kinds of forage
2. raising legumes
3. raising grasses
4. establishing pastures.

F. Vegetable crops.

V. Agri-business

A. Farm management.

B. Income tax.

C. Farm management agriculture mathematics.

D. Farm laws.

E. Tenancy and farm leases.

F. Hazards and insurance.

G. Farm opportunities and cooperations.

H. Government programs.

I. Living in today's world.

J. Opportunities in agri-business.

K. Marketing farm products.

L. How to complete application forms.

Learning Experiences

The learning experiences that are recommended for Vocational Agriculture III are as follows.

1. Individual research work - this involves going to the library and other information retrieval centres to search for information that the student could use to execute a project.
2. Group work - sometimes a group of students to be assigned a given task so as to develop the spirit of team work and leadership qualities.
3. Students to be placed in an agro-base or agro-allied industry for work experience.
4. Discussions, debates, or butt sessions on the current societal issues that have implications to agriculture and people working in it.
5. Practice how to attend an interview and how to fill application forms. Record keeping should also be used.

Evaluation Guide

Vocational Agriculture III being the last phase of the entire vocational agriculture curriculum, it is recommended that students be evaluated by external examiners (from Ministry of Education or W.A.E.C.) in collaboration with the teachers in order to be issued with a certificate, or a diploma that will indicate that the student successfully completed the program. The certificate or diploma should enable the student to either continue with college studies or become employed in farming or any agro-allied industry.

Recommended Program Evaluation Scheme (PES)

The following recommendations are not based on any hard research data for this study, but they are made so that the recommended curriculum in vocational agriculture can be evaluated for its strengths and weaknesses.

A detailed analysis of the curriculum model (Figure 10) that resulted from this study will show that evaluation is continuous not only of the students but also the instructor and the entire program. The following is the recommended program evaluation scheme which could be used for the vocational agriculture curriculum for secondary schools of Kano State, Nigeria.

Scheme 1. Student Evaluation of the Program (SEP)

1. At the end of each term (semester) an evaluation form should be given to students to evaluate whether or not the objectives (which were given to the students at the beginning of each term) were met or not. On the evaluation form provision should be made for students to indicate both the weaknesses and strengths of the program as well as areas that need improvement.
2. At the end of the year, another evaluation form should be given to students to ascertain if the objectives of that particular year's phase of the vocational agriculture curriculum were achieved or not. Also, students should be asked to indicate areas of the course that need modification.
3. At the end of the sixth year of the program, another general evaluation form for the entire program should be made available to the students.

Scheme 2. Teacher Evaluation of the Program (TEP)

1. The teachers for the entire phases of the vocational agriculture program should also evaluate each term's activities. This will help them identify areas that need to remain, areas that need to be modified and the areas that might be deleted. For the teacher evaluation of the program to have any validity, it should be correlated with the students' evaluation of the program

to identify areas of agreement and disagreement so that the teacher could act accordingly to improve the program.

2. End of year teachers' evaluation is to serve as a gauge for the activities taken during the year for each phase of the program and to identify areas that need to be modified. The teachers should also review all of the components of the total program from instruction, content, learning outcomes, aims, goals and objectives as well as philosophical statement. If any of the above components of the curriculum is wanting, then changes can be made.

3. Entire curriculum evaluation by teachers to ascertain if the program's objectives are being achieved or not. Also to determine if instruction is compatible with the curriculum content, and if the content is in concert with the intended learning outcomes, and whether or not the aims and goals of the curriculum complement the philosophical statement that was established for Nigerian education.

Scheme 3. Professional Evaluation of the Program (PEP)

Program evaluation of the Vocational Agriculture program is to be conducted by curriculum practitioners from Kano State Ministry of Education to determine the validity of all facets of the program as well as its worthwhileness and appropriateness.

All the above schemes should be undertaken continuously and whatever changes that are deemed necessary to better the program should be undertaken with dispatch.

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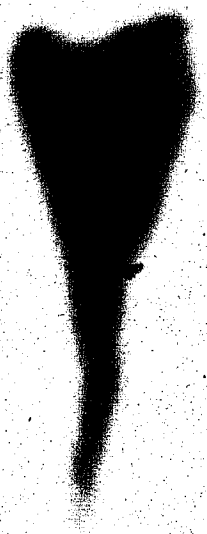

APPENDIX A

Sample Letter and Names and Addresses of
The State Supervisors of Vocational Agriculture in
the Mountain Plains Region of
The United States of America (U.S.A.)

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 0Y1

January 21, 1980

_____
_____
_____
_____

Dear _____,

I am a graduate student, enrolled in the Master's degree program at the above university. Part of the requirement for this degree calls for the completion of a thesis.

The topic that I have selected for my thesis is "A Model Vocational Agriculture Program in the Secondary School for Kano State, Nigeria."

Part of the research design requires that I contact principals of selected high schools that offer a program in vocational agriculture. Because of your position as State Supervisor for Vocational Education, I thought that you might be able to help me identify the schools, and their principals, that offer a program in vocational agriculture. The list will be exclusively used by the researcher to select those schools that may be contacted to collect data for the research.

After receiving this list, the researcher will write to each principal asking them to cooperate in the study.

It would also be appreciated if you could send me a Curriculum Guide that is used in your state/province that gives direction to the program in vocational agriculture.

Thank you for your cooperation.

Yours truly,

Ibrahim Adamu Khaleel
Graduate Student
Department of Industrial and
Vocational Education

IAK/jl

Return Address: c/o Dr. C.H. Preitz

Names of Personnel, either at the State or provincial level, to be contacted in Vocational Agriculture.

	Name	Address
1.	H. Neville Hunsicker, Program Specialist, Agriculture, Agribusiness and natural resources.	Division of Vocational and Technical Education. U.S. Office of Education Department of Health, Education and Welfare 7th & D Sts., S.W. Washington, D.C. 20202
2.	Robert Crawley, Supervisor, Agricultural Education.	Arch Ford Foundation Bldg. Little Rock, Arizona 72201
3.	Siol Koon, Supervisor, Agriculture Education	207 State Service Bldg. 1525 Sherman St. Denver, Colorado 80203
4.	William A. Dannenhauer, Supervisor, Agricultural Occupations.	The Townsend Bldg. P.O. Box 1402 Dover, Delaware 19901
5.	Ralph Edwards, Supervisor, Agriculture Education	State Board for Vocational Education 650 W. State St. Boise, Idaho 83720
6.	William M. Baley, Associale Superintendent, Area Schools and Career Education Branch	Grimes State Office Bldg. Des Moines, Iowa 50319
7.	Les Olsen, Agricultural Education Specialist	State Education Bldg. 120E Tenth St. Topeka, Kansas 66612
8.	J.C. Simmons, Section Chief, Vocational Agriculture/ Agribusiness.	Vocational Education P.O. Box 44064 Baton Rouge, Louisiana 70804
9.	Paul Day, Secondary Vocational Program Supervisor, Agriculture, Natural Resources and Manne Science Occupations.	Division of Vocational - Technical Education Capitol Square Bldg. St. Paul, Minnesota 55101

10.	C.M. Brewer, Supervisor, Agricultural Education	Division of Vocational and Technical Education P.O. Box 771 Jackson, Mississippi 39205
11.	Larry Johnson, Manager, Division of Program Development	Department of Vocational and Occupational Services Office of Public Instruction State Capital Helena, Montana 59601
12.	R. Courtney Riley, Director, Vocational, Technical and Adult Education	400 W. King St. Carson City, Nevada 89710
13.	Rosco Vaugh, Supervisor, Vocational Agriculture	Education Bldg. Santa Fe, New Mexico 87503
14.	Reuben Guenthner Assistant Director Vocational Education	State Office Bldg. 900 East Boulevard Ave. Bismark, North Dakota 58501
15.	Earl F. Kantner, Supervisor, Youth Program	Agriculture Service Division of Vocational Education Ohio Department Bldg. Columbus, Ohio 43215
16.	Ralph Dressen, Supervisor, Agricultural Education	1515 W. Sixth Ave. Stillwater, Oklahoma 74074
17.	Frank R. Stover, Supervisor, Agricultural Education	Rutledge Bldg. Columbia, South Carolina 29201
18.	Larry Nelson, Supervisor, Agricultural Education	Division of Vocational-Technical Education Richard F. Kneip Bldg. Pierra, South Dakota 57501
19.	Jed W. Wasden, Coordinator Secondary Vocational Programs	State Board for Vocational Education 250E, Fifth S. St. Salt Lake City, Utah 84111
20.	Bruce King, Coordinator, Agricultural Occupations	State Office Bldg. West Cheyenne, Wyoming 82002

APPENDIX B

FOLLOW-UP LETTER
to the State Supervisors of Vocational Agriculture
in the Mountain Plains Region of the U.S.A.

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 0Y1

February 27, 1980

_____
_____
_____
_____

Dear _____:

I am checking back with you concerning a letter that I wrote to you on January 21, asking your assistance in research that I am conducting. That research has to do with designing a model vocational agriculture program for secondary schools in Kano State, Nigeria.

Some State administrators of vocational agriculture have provided me with the information that I requested. To be of maximum value and representative of the actual situation in the United States, I need additional information.

There is a strong possibility that information that was requested in my initial correspondence was sent, but lost in the mail. Because of this possibility, I would like to request that you send me a list of secondary schools in your state that offer a program of study in vocational agriculture, and a curriculum guide.

Because of the time frame within which this study is to be conducted, could you reply this letter to me by Friday, March 21.

Thank you for your cooperation.

Yours truly,

Ibrahim Adamu Khaleel
Graduate Student

IAK/jl

APPENDIX C

SAMPLE LETTER
and Names and Addresses of the Administrators of the Schools Selected to Participate in the Research

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 2G5

March 17, 1980

Mr. Howard Moon
Central KS AUTS Haven
High School Haven
KANSAS, U.S.A. 67543

Dear Mr. Moon:

I am a graduate student, enrolled in the Master's degree program in the above university. Part of the requirements for this degree calls for the completion of a thesis.

The topic I have selected for my thesis is "A Model Vocational Agriculture Program for the Secondary Schools in Kano State, Nigeria."

The research design for the study calls for me to contact principals of selected schools in the Mountain Plains Region of the United States that offer a program in vocational agriculture. Your name and the name of your school and address was received from Mr. the state supervisor for vocational education of your state Department of Education.

The purpose of this letter is to seek for your cooperation in the research by furnishing me with a curriculum guide, a program of studies, a course description, a course outline or a syllabus for vocational agriculture course(s) that is currently taught in your school. These materials will be used by me to design the model program in vocational agriculture that will be the result of this study.

Enclosed you will find a self-addressed stamped envelope to return the requested curriculum materials. Because of the time limit that I have established for the research, it will be appreciated if you could return any of the above materials to me not later than April 14th. At that time I will begin to review these materials to identify the various components for the curriculum model.

....2

Any material that is furnished to me will be treated as privileged information and will be used only by the researcher.

Those who cooperate in the research will receive a copy of the abstract.

Thank you for your cooperation.

Yours truly,

Ibrahim Adamu Khaleel
Graduate Student

IAK/jl
Encl.

The following schools will be used in the research as sample schools in the Mountain Plains Region of the United States of America that satisfy the established criteria for the study.

School Name and Address	Principal's Name	Supervisor's Name
1. Central KS AVTS Haven High School HAVEN, 67543	Howard Moon	Les Olsen
2. Central KS AVTS McPherson High School 801 East First St. MCPHERSON 67460	Keith Rickner	Les Olsen
3. Barnesville High School BARNESVILLE, MN 56514	D. Keena	Paul Day
4. Blooming Prairie High School 202 4th Avenue N.W. BLOOMING PRAIRIE, MN 55917	Glen Robinson	Paul Day
5. Byron High School Box 157 BYRON, MN 55920	Charles Skarie	Paul Day
6. Duluth AVTI 2101 Trinity Road DULUTH, MN 55811	Cliff Wickland (Director)	Paul Day
7. East Grand Forks AVTI EAST GRAND FORKS, MN 56721		Paul Day
8. Farmington High School 800 Akin Road FARMINGTON, MN 55024	Leslie Lindell	Paul Day
9. Forest Lake High School 6101 Scandia Trail FOREST LAKE, MN 55025	W. Rand	Paul Day
10. Frazee High School Box 186 FRAZEE, MN 56544	H. Schlepp	Paul Day

School Name and Address	Principal's Name	Supervisor's Name
11. Grand Rapids High School GRAND RAPIDS, MN 55744	I. Keranen	Paul Day
12. Hastings High School HASTINGS, MN 55033	R. Rigg	Paul Day
13. Holding Ford High School HOLDING FORD, MN 56340	E. Lowe	Paul Day
14. Lewiston High School LEWISTON, MN 55952	J. Williams	Paul Day
15. Little Falls High School LITTLE FALLS, MN 56347	J. Will	Paul Day
16. Melrose High School MELROSE, MN 56352	F. Hertzog	Paul Day
17. Minneapolis (Roosevelt High School). 4029 - 28th Avenue S. MINNEAPOLIS, MN 55406	G. Roehning	Paul Day
18. North Field High School NORTH FIELD, MN 55057	W. Gasho	Paul Day
19. Owatona High School OWATONA, MN 55060	D. Landswerk	Paul Day
20. Perham High School PERHAM, MN 56573	D. Drummond	Paul Day
21. Pierz (Healy High School) PIERZ, MN 56364	C. Miedema, Jr.	Paul Day
22. Watertown-Mayer High School WATERTOWN, MN 55388	L. Enter	Paul Day
23. Willmar High School WILLMAR, MN 56201	C. Schlosser	Paul Day
24. Winona AVTI WINONA, MN 55987	W. Hemsey	Paul Day
25. East High School 2800E Pershina CHEYENNE, 82001	Jim Cotton	Bruce King

School Name and Address	Principal's Name	Supervisor's Name
26. Lander Valley High School 100 Main St. LANDER 82520	Arland Carlson	Bruce King
27. Bear River High TREMONTON, Utah 84337	Darwin S. Woodbury	Jed W. Wasden
28. Bingham High 2200 West, 10400 South RIVERTON, Utah 84065	Thomas Owen	Jed W. Wasden
29. Clearfield High 325 South, 1000 East CLEARFIELD, Utah 84015	Grant Steed	Jed W. Wasden
30. Davis High School 325 South Main KAYSVILLE, Utah 84037	Richard S. Stevenson	Jed W. Wasden
31. Payson High 1050 South Main PAYSON, Utah 84651	Vernon J. Finch	Jed W. Wasden
32. Spanish Fork High 99 North, 3rd West SPANISH FORK, Utah 84660	Rulon Nelson	Jed W. Wasden
33. Jamestown Valley Voc. Center 12th Ave., 10th St. N.E. JAMESTOWN 58401	Harriet Shurr	Reuben Guenthner
34. Minot High School 11th Avenue, S.W. MINOT 58701	Richard Olthoff	Reuben Guenthner
35. Des Moines High School P.O. Des Moines Tech 1800 GRAND AVENUE DES MOINES 50307	Donald Blackman	William M. Baley

APPENDIX D

FOLLOW-UP LETTER
to the Administrators of the Schools
Selected to Participate in the Research

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 2G5

May 9, 1980

Charles Sha[illegible]ie
Byron High Scho[illegible]
Box 157
BYRON, Minne[illegible] 55920

Dear Mr. Sha[illegible]e:

On March 17, 1[illegible]0 I wrote you a letter asking you to cooperate in a study I am conducting. The topic of that research is "A Model Vocational Agriculture Pro[illegible]am for the Secondary Schools in Kano State, Nigeria."

Some school principals from the Mountains Plains Region have provided me with the information that I requested. There is the possibility that information that was requested in my initial letter was sent, but lost in the mail. Because of that possibility, it would be appreciated if you send me curricul[illegible]uides, programs of studies, course descriptions, course outlines, [illegible]llabii for the vocational agricultural courses taught in your s[illegible]ol. To be of maximum value and representative of secondary school vocational agriculture in the United States, I would like to include the information from your school.

Because of the time line that has been established for this study, I am requesting that you reply to this letter by Monday, May 26.

The information that you send me will be treated as confidential and will be made available only to the researcher.

Thank you for your cooperation.

Yours truly,

Ibrahim Adamu Khaleel
Graduate Student

IAK/jl

Follow-up list of schools and their principals of the Mountain Plains Region, United States.

1. I. Keranen
   Grand Rapids High School
   GRAND RAPIDS, Minnesota 55744

2. J. Williams
   Lewiston High School
   LEWISTON, Minnesota 55952

3. D. Drummond
   Perham High School
   PERHAM, Minnesota 56573

4. C. Miedema, Jr.
   Pierz (Healy High School)
   PIERZ, Minnesota 56364

5. C. Schlosser
   Willmar High School
   WILLMAR, Minnesota 56201

6. W. Hemsey
   Winona AVTI
   WINONA, Minnesota 55987

7. Jim Cotton
   East High School
   2800E Pershina
   CHEYENNE, Minnesota 82001

8. Arland Carlson
   Lander Valley High School
   100 Main St.
   LANDER 82520

9. Thomas Owen
   Bingham High
   2200 West, 10400 South
   RIVERTON, Utah 84065

10. Vernon J. Finch
    Payson High
    1050 South Main
    PAYSON, Utah 84651

11. Ruboh Nelson
    Spanish Fork High
    99 North, 3rd West
    SPANISH FORK, Utah 84660

12. Richard Olthoff
    Minot High School
    11th Avenue
    S.W. MINOT · 58701

13. Donald Blackman
    Des Moines High School
    P.O. Des Moines Tech.
    1800 Grand Avenue
    DES MOINES 50307

14. Howard Moon
    Central KS AVTS Haven High School
    HAVEN 67543

15. Keith Richner
    Central KS AVTS
    McPherson High School
    801 East First St.
    McPHERSON 67460

16. D. Keena
    Barnesville High School
    BARNESVILLE, Minnesota · 56514

17. Charles Sharie
    Byron High School
    Box 157
    BYRON, Minnesota 55920

APPENDIX E

A Letter to the Members
of the Panel of Consultants,
Their Names and Addresses

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 2G5

May 23, 1980

Professor Herbert M. Lapp
Department of Agric. Eng.
University of Manitoba,
Winnipeg, Manitoba
R3T 2N2

Dear Mr. Lapp:

I am a graduate student, enrolled in the Master's degree program at the above university. Part of the requirement for this degree calls for the completion of a thesis.

The topic that I have selected for my thesis is "A Model Vocational Agriculture Program for the Secondary School for Kano State, Nigeria."

Part of the research design is that a copy of the proposed model for the vocational agriculture education program be reviewed by a panel of specialists in agriculture. Specialists who have served in Nigeria under the auspices of the Canadian International Development Agency (CIDA) as agricultural specialists. Because you have served in such a capacity I would like you to cooperate in the study by serving as a member of the panel of consultants.

Enclosed, you will find a copy of my research design, which contains all aspects of the study. I hope you will accept this task by serving as a member of the panel of consultants. Those who participate in the study will be acknowledged for their time and effort.

Thank you for your cooperation.

Yours truly,

Ibrahim Adamu Khaleel
Graduate Student

IAK/jl
Encl.

Names of Members of the Panel of Consultants

1. Professor Herbert M. Lapp
   Department of Agricultural Engineering
   University of Manitoba
   WINNIPEG, Manitoba
   R3T 2N2

2. Dr. Gordon Yaciuk
   International Development Branch
   Centre Suite 304, 10454 Whyte Avenue
   EDMONTON, Alberta
   T6E 4Z7

APPENDIX F

A Follow-up Letter to
the Members of the Panel of Consultants
Who Reviewed the Developed
Vocational Agriculture Curriculum

FACULTY OF EDUCATION
DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION
TELEPHONE (403) 432-3678

THE UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA, CANADA
T6G 2G5

June 20, 1980

Dr. Gordon Yaciuk
International Development Research Centre
Suite 304, 10454 Whyte Avenue
EDMONTON, Alta.
T6E 4Z7

Dear Mr. Yaciuk:

This is a follow-up letter to the one I wrote to you on May 23, 1980, seeking your cooperation to become a member of the panel of consultants, to whom I will submit the content of the developed vocational agriculture curriculum for the secondary schools of Kano State, Nigeria for review, analysis and criticisms.

Enclosed, you will find a copy of the developed curriculum content. I hope you will review it and outline or point out your criticisms accordingly. Because of the time limit within which the study is to be finished, can you please return the material with your comments to me by July 11, 1980.

I do really appreciate your efforts, cooperation and time spent on this material.

Thank you very much.

Yours truly,

Ibrahim Adamu Khaleel
Graduate Student

IAK/jl
Encl.

APPENDIX G

Federal Government's (Nigeria) Grant on Education to the States

Tables 1-6

Table 1

Capital Grants for Primary Education and Grade 2 Teachers' Colleges by States for Financial Years 1976-77 and 1977-78 (in Naira*)

STATE	1976/77			1977/78		
	Primary	Teacher Training	Total HPE	Primary	Teacher Training	Total HPE
Anambra	8,342,532	4,820,144	13,162,676	2,000,000	2,000,000	4,000,000
Bauchi	2,973,215	5,712,230	8,685,445	3,500,000	2,893,655	6,393,655
Bendel	10,062,666	4,197,842	14,260,508	3,189,030	3,153,405	6,342,435
Benue	3,175,804	4,597,122	7,772,926	3,000,000	2,000,000	5,000,000
Borno	2,601,302	7,045,564	9,646,866	5,000,000	2,837,436	7,837,436
Cross River	10,256,206	7,218,225	17,474,431	3,000,000	3,139,822	6,139,822
Gongola	5,005,510	8,282,974	13,288,484	3,500,000	6,040,000	9,540,000
Imo	8,271,194	3,738,609	12,009,803	2,400,000	2,000,000	4,400,000
Kaduna	11,116,441	8,884,892	20,001,330	7,380,009	2,000,000	9,380,009
Kano	12,131,038	10,892,086	23,023,124	6,000,000	2,000,000	8,000,000
Kwara	9,538,412	3,920,863	13,459,275	2,500,000	2,000,000	4,500,000
Lagos	13,890,626	827,338	14,717,964	3,186,254	2,000,000	5,186,254
Niger	2,025,000	2,762,590	4,787,590	2,400,000	2,000,000	4,400,000
Ogun	321,524	1,860,911	2,182,435	2,000,000	2,000,000	4,000,000
Ondo	717,838	3,270,983	3,988,821	2,500,000	2,000,000	4,500,000

(cont'd...)

Table 1 (cont'd)

STATE	1976/77 Primary	1976/77 Teacher Training	1976/77 Total HPE	1977/78 Primary	1977/78 Teacher Training	1977/78 Total HPE
Oyo	1,744,305	5,123,501	6,867,806	4,000,000	3,127,000	7,127,000
Plateau	6,287,450	3,916,067	10,203,517	2,500,000	2,000,000	4,500,000
Rivers	5,821,876	1,097,122	6,918,998	3,450,497	2,000,000	5,450,497
Sokoto	8,369,744	12,390,887	20,760,631	5,000,000	2,000,000	7,000,000
"Headquarters Allocation"					21,000,000	
TOTAL	122,652,682	100,559,952	223,212,634	66,505,790	68,191,318	134,697,108

* One Naiva (₦1.00) is approximately two Canadian dollars ($2.00).

Source: Implementation Committee for the National Policy on Education, Parts One and Two Blue Print Supplement. Section B Financing of Education, the Federal Government Contribution, 1979, p. 15.

Table 2

Capital Grants for Secondary Education to States
Financial Years 1976-77 and 1977-78

State	1976-77 (Naire)	1977-78 (Naire)
Anambra	757,500	440,000
Bauchi	1,352,500	790,000
Bendel	539,000	315,000
Benue	1,402,500	820,000
Borno	1,642,500	960,000
Cross River	1,650,500	960,000
Gongola	1,474,500	855,000
Imo	1,000,000	580,000
Kaduna	3,421,000	2,000,000
Kano	5,691,500	3,325,000
Kwara	1,549,000	910,000
Lagos	731,000	2,420,000
Niger	1,171,500	680,000
Ogun	172,500	1,125,000
Ondo	304,000	350,000
Oyo	580,500	175,000
Plateau	1,171,500	680,000
Rivers	938,000	525,000
Sokoto	4,450,500	2,590,000
TOTAL	30,000,000	20,500,000

Source: Parts One and Two Blue Print Supplement. Section B, Financing of Education, the Federal Government Contribution, 1979, p. 19.

Table 3

Recurrent Expenditure on Grants for Technical and Vocational Education by State Financial Year 1976-77

State	Sub-head 85	Sub-head 87	Total Subventions
Anambra	266,700	113,320	380,020
Bauchi	13,200	28,330	41,530
Bendel	381,100	141,650	522,750
Benue	148,500	56,660	205,160
Borno	85,800	56,660	142,460
Cross River	577,300	141,650	718,950
Gongola	84,800	56,660	141,460
Imo	479,600	198,310	677,910
Kaduna	221,200	84,990	306,190
Kano	232,100	84,990	317,090
Kwara	176,600	198,310	374,910
Lagos	---	---	---
Niger	71,600	84,990	156,590
Ogun	78,100	84,990	163,090
Ondo	117,400	56,660	174,060
Oyo	193,300	113,320	306,620
Plateau	42,000	28,330	70,330
Rivers	268,300	141,650	409,950
Sokoto	81,600	28,330	109,930
TOTAL	3,514,200	1,699,800	5,214,000

Source: Parts One and Two Blue Print Supplement. Section B, Financing of Education, the Federal Government Contribution, 1979, p. 21.

Table 4

Federal Government Expenditure on Primary, Secondary and Post-Secondary Education*
for the Financial Years 1976/77 and 1977/78

TYPE OF EDUCATION AND EXPENDITURE	CAPITAL		RECURRENT		TOTAL	
	1976-77	1977-78	1976-77	1977-78	1976-77	1977-78*
1. Primary education grants	122,652,682	66,505,790	270,720,490	N.A.	393,373,172	N.A.
2. Grade 2 - Teacher-training: grants	100,559,952	68,191,318	115,590,953	N.A.	216,150,905	N.A.
a) Sub-total: Federal Grants UPE (1&2)	223,212,634	134,697,108	386,311,443	456,641,489	609,524,077	591,338,597
3. Federal Government Colleges	14,502,955	41,900,557	N.A.	N.A.	N.A.	N.A.
4. Federal Sixth Form Institutions	6,622,800	11,760,906	N.A.	N.A.	N.A.	N.A.
5. Federal Secondary Technical Education	200,000	603,376	N.A.	N.A.	N.A.	N.A.
b) Sub-total: Federal Secondary Institutions (3,4&5)	21,325,755	54,264,839	13,613,916	21,746,574	34,939,671	76,011,413
6. Grants for Secondary Education	30,000,000**	20,500,000	--	--	30,000,000**	20,500,000
7. Subvention for Technical and Vocational Schools	--	--	--	5,214,000	--	5,214,000
c) Sub-total: Federal Government Subvention for Secondary Level Education (6&7)	30,000,000	20,500,000		25,714,000	30,000,000	25,714,000
d) Sub-total: Federal Govt. Expenditure on Secondary Level Education (b&c)	51,325,755	74,764,839	13,613,916	26,960,574	64,939,671	101,725,413
8. Federal A.T.T.C.S.	14,688,110	15,718,000	--	30,000	14,688,110	15,748,000
9. Grants to A.T.T.C.S.	2,000,000	2,400,000	--	--	2,000,000	2,400,000
e) Sub-total: Federal Govt. Expenditure on A.T.T.C.s (8&9)	16,688,110	18,118,000	--	30,000	16,688,110	18,148,000
10. Federal Colleges of Technology	1,000,000	7,934,864	3,660,848	6,168,200	4,660,848	14,103,064
11. Grants to Colleges of Technology & Polytechnics	9,411,000	15,000,000	--	23,837,620	9,411,000	38,837,620
f) Sub-total: Federal Govt. Expenditure on Colleges of Tech. & Polytech. (10&11)	10,411,000	22,934,864	3,660,848	30,005,820	14,071,848	52,940,684
g) Sub-total: Federal Govt. Expenditure on Post-Secondary Education (e&f)	27,099,110	41,052,864	3,660,848	30,035,820	30,759,958	71,088,684
Total: Federal Govt. Expenditure on Education (a+d+g)	301,637,499	196,249,972	403,586,207	513,637,883	705,223,706	764,152,694

N.A. = Not available.

* Excluding universities & scholarships.
** A.T.C., Kontagora, only.

Table 5

Expenditure by Programme
Financial Years 1976-77 and 1977-78

1976-77

Naira

Programme	Recurrent	Capital	Total
U.P.E.*	386,311,443	223,212,634	609,524,077
Secondary Education	13,613,916	51,325,755	64,939,671
Advanced Teacher Education	--	16,688,110	16,688,110
Higher Tech. Education	3,660,848	10,411,000	14,071,848
University Education	186,726,000	106,835,000	293,561,000
TOTAL	590,312,207	408,472,499	998,784,706

1977-78

Programme	Recurrent	Capital	Total
U.P.E.*	456,641,489	134,697,108	591,338,597
Secondary Education	26,960,574	74,764,839	101,725,413
Advanced Teacher Education	--	18,118,000	--
Higher Tech. Education	30,005,820	22,934,864	52,940,684
University Education	180,130,000	110,000,000	290,130,000
TOTAL	--	360,514,811	--

* Includes the expendiyure {expenditure} on Grade 11 Teacher Training College which train teachers for the primary level.

Source: [redacted] Financing of Education, the Federal [redacted] Contribution, 1979, p. 30.

Table 6

Expenditure
Non-Statutory Appropriation of Revenue

Details of Expenditure	Provision 1980	Provision 1979-80	Actual Expenditure 1978-79
	N	N	N
Grants to States for UPE Schemes	412,630,000	548,186,800	95,524,941
Vocational and Citizenship Training Centres: grants	3,000,000	4,000,000	4,250,250
Indigent Students (Scholarship and Bursaries): grants	832,000	950,000	950,544
Grants to States for Secondary Education	30,000,000	40,000,000	--
TOTAL	446,462,000	593,136,800	100,725,735

Source: West Africa Magazine, No. 3272, April 1980, p. 688.

V I T A

Name: Ibrahim Adamu Khaleel

Birth: March 15, 1953; Kano, Nigeria

Education: Primary: Kwalli, Kano, 1960-1966;
Secondary: Birnin Kudu, Kano, 1967-1971;
College: Kaduna Polytechnic, 1972-1975;
Universities: McGill University, 1977-1979
The University of Alberta,
1979-1980

Positions: Teacher: Technical & Vocational Training Centre (TVTC) 1975-1977;
Vice Principal: TVTC, 1977.

Honors: McGill University
Montreal, Quebec, Canada
1979 - Bachelor of Education (Vocational) with honors.

Travel: Nigeria, and Canada.