STRUCTURE, POLICY AND CAREER ADVANCEMENT IN TECHNICAL EDUCATION AND TRAINING IN KENYA: A COMPARATIVE STUDY.

BY

FRED SIMIYU BARASA

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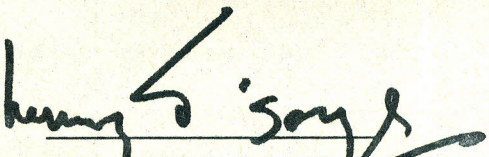
DECLARATION

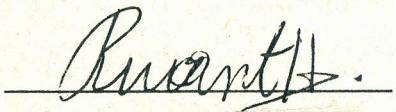
This thesis is my original work and has not been presented for degree work in any other university.

FRED SIMIYU BARASA

This thesis was submitted for examination with our approval as University Supervisors.



DR. HENRY D'SOUZA
DEPARTMENT OF EDUCATIONAL FOUNDATIONS
KENYATTA UNIVERSITY



DR. H. RWANTABAGU
DEPARTMENT OF EDUCATIONAL FOUNDATIONS
KENYATTA UNIVERSITY

PREFACE

The purpose of this study was to analyse the influence of structure and policy on career advancement of the technical manpower in Kenya, and through a comparative study of the Republic of Korea and Nigeria, propose a structural model and some policy refinements for Kenya.

Chapter 1 of this study is mainly an introductory chapter, in which we give the statement of the problem, significance and limitations of the study, and briefly justify our choice of the reference countries.

Chapter 2 entails a review of the relevant literature. This is done at two main levels: International and Intra-national. At the international level, we review recent major policy publications by UNESCO and the World Bank, while at the intra-national level we review literature based on Kenya.

In chapter 3, the results of a survey on post-school technical education and training in Kenya are analysed. In particular, the career opportunity index of artisans, craftsmen and technicians is established.

The specific influence of the structure, examinations and certification, financing as well as recruitment policies to career mobility is analysed in chapter 4 and 5. However, while chapter 4 focuses on prevocational education and training at primary and secondary school levels, the focus of chapter 5 is on post-school technical education and training.

Finally, in chapter 6, we give the overal conclusions of the study, recommend a structural model as well as specific policy reforms in technical education and training for Kenya and suggest areas for further research.

DEDICATION

This thesis is dedicated to my wife, Christine, my daughter Faith Nekesa and my son Jimmy Barasa, whose steadfast love, encouragement and fellowship motivated and sustained me throughout this study.

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I wish to acknowledge the assistance of various people without whom this study would not have been possible.

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I owe special appreciation to my wife, Mrs. Christine Simiyu, who firmly stood by me through prayer during moments of discouragement, and often spend long hours assisting me in various aspects of this study.

Finally, I wish to specifically thank the following: Prof. D.N. Sifuna, for assisting me, through official correspondence, to obtain vital data and other relevant documents from Unesco, Ilo and the World Bank.

Lucy Munge for spending long hours in typing this thesis; and various principals and heads of technical

training institutions, as well as trainees in those institutions, for providing information either through responding to interviews or questionnaires.

To all these people, and many others not specially mentioned here:

THANK YOU AND GOD BLESS YOU

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CHAPTER ONE

THE PROBLEM

CHAPTER I

This is an introductory chapter in which we will outline the statement of, and background to the problem, give the purpose, significance and limitations of the overall study and briefly justify the choice for reference countries. Further, we will analyse the methodological framework of the study and finally give the definition of important concepts and terms used in this study.

Statement of the Problem

One effect of the high rate of population growth in Kenya has been an increased demand for formal education and rising unemployment among school leavers. This in turn has accelerated achievement aspirations among students and competition for the relatively few chances available at every level of education. The consequence is clear: a relatively small percentage of students, compared to that for developed countries, have access to higher levels of education through the formal academic route. It has been estimated for example, that in Kenya, only 35% of primary school-leavers proceed to secondary school and only 3% of secondary school-leavers proceed to university.[1] Further, the majority of the "dropouts" lack skills necessary for employment, especially in the industrial sector.

One of the solutions attempted has been to put greater emphasis on vocational and technical education at both primary and secondary school levels. The majority of the students, under the 8-4-4 system of education, are therefore expected to opt for employment or training in institutions which offer lower levels of qualifications than those obtained at a university.

Technical education and training, however, should have a dual purpose: to provide skilled workers for industry and other sectors of the economy while at the same time allowing for the development of an individual's potentialities to the full.

Kenya, like most other developing countries, has been faced with the problem of providing adequate technical personnel (in terms of both quality and quantity), to enhance and sustain national economic developemnt. The response to this challenge has ranged from the establishment of new technical institutions and expansion of existing ones, to innovations in both school and post-school curricula. Thus, some appreciable effort has been made and is being made to tackle the problem.

However, one problem still persists: the apparent lack of vertical educational mobility among technical

graduates. This problem exists at the level of both structure and policy guiding the provision of technical education and training. The attendant question is: what structural and policy refinements in the Kenyan technical education and training system would increase accessibility to further education and hence promote career advancement of students pursuing a technical career, either within the formal school system, or upon initial employment in industry?

Background to the Problem

Technical education is receiving special emphasis in both developed and developing countries. This shift of focus from a mainly academic to an increasingly technical and vocational biased curriculum is accounted for by two major reasons: "lack of skilled manpower for economic developemnt; and rising unemployment among products of the traditional education system".[2]

In Kenya, some kind of technical education with hand tools, needed for the agricultural sector mainly, was offered to Africans by the colonial government. However, it was strongly resisted by the Africans who felt it was "designed to hamper their political advancement ... and closed doors on them for any hopes of obtaining clerical or white collar jobs".[3] It is

evident from common knowledge and past research that people generally resent any system that places barriers to their advancement of whatever kind: political, economic or professional. As B. Holmes points out, one of the post-world war II results, worldwide, was an explosion of expectations.[4] People developed high ambitions of achievement whereby they would like to see their potentialities fully developed and utilized. This not only gives them self-satisfaction but also some social esteem.

Recognising this human aspiration factor, UNESCO recommended that:

> Technical and Vocational education should be so organized that every person can continue his education until his potentialities have been developed to the full .... access to levels of technical and vocational education and general education should be open to any capable person. Appropriate measures for making such access possible should be taken.[5]

Kenya, like many other newly independent African countries, put a lot of emphasis on academic education which had been denied to the Africans by the colonial rulers. This led to a massive expansion of school facilities and subsequent growth of student enrolments at all levels of education. Primary school enrolment rose from 891,553 in 1963 to 2,881,155 in 1973, while

secondary school enrolment rose from 31,120 to 175,325 in the same period.[6]

However, as already stated, the system faced a rising rate of unemployment among school-leavers. In the 1979-83 Development Plan, the government identified three factors as major causes of school-leaver unemployment: lag between rate of school leaver output and the number of jobs requiring their skills; explosive unrealistic aspirations among school-leavers for higher job-placements; and inappropriate skills (or lack of them)among school-leavers for medium range jobs.[7] It is here noticed that the twin factors: high aspirations and lack of skills, were among the chief causes of unemployment among school-leavers.

The same plan further noted that various government ministries could not spend the funds allocated to them for development due, in part, to the shortage of technical skills for project implementation. The skills in question ranged from highly trained graduate Engineers to the craftsmen and Artisans. It was revealed that whereas there was to be a projected surplus of 235 Engineering Technicians, there was to be a staggering deficit of 674 Engineers and 325 Artisans.[8] Need clearly exists of examining the

linkages among these categories of Artisans, Craftsmen, Technicians and Engineers. What bottlenecks exist in the vertical mobility within these ranks?

Research carried out by D.N. Sifuna (1982) showed that most students admitted in technical schools had scored highly in the certificate of Primary Education (C.P.E.) examinations and had high aspirations: to become Engineers rather than Technicians. He recommended that:

> Rather than looking for ways to keep these students as Artisans, ways of providing chances for their advancement through employment should be sought.[9]

The need to re-examine and refine technical education policy with a view to improving career advancement of students is evident. Commenting on this subject, O.N. Kefa noted that "most students in technical schools, ... never found their way to becoming engineers".[10] At the same time, in a major Newspaper article, B. Muchungu asked the crucial question: "What are the prospects of technical training institutions' leavers?"[11] He went further to question the hierarchy of technical institutions themselves noting for example that the Youth Polytechnics, which had been initially designed to admit primary school "dropouts" now admitted trainees who had gone well past primary school but had failed

to get other avenues for training in other trades.

This problem is not unique to Kenya but faces other countries in the world. As B. Holmes, L.G. Howe and J.A. Lauwerys noted:

> Changing circumstances have placed vocational or technical training at all three levels of education in terms of skills both practical and managerial in the forefront of the world's educational problems.[12]

They noted that a need existed for developing "a co-ordinated system of policies at a national level which will deal with vocational guidance, methods of recruitment, the content of pre-vocational training, in-service training and examination systems which serve two functions - those of selection and qualifications".[13]

The government of Kenya has infact realized that need exists of streamlining the educational system so as to give greater chance of advancement to technical graduates whose role in national economic development cannot be over-emphasized. This is evident from the remarks of the Minister for Technical Training and Applied Technology who said:

> the government plans to streamline technical education in the country to help competent artisans obtain training upto university level ... the Ministry would ensure the

> technical component of the 8-4-4 system was implemented to give the young people a fair chance in the national economic climate.[14]

The ideas expressed in this background to the problem motivated the researcher to undertake the study.

Purpose of the Study

This study had a dual purpose:

(i) to analyse the influence of structure, policy and processes of financing, recruitment, examination, certification and promotion in technical education and training on career advancement in Kenya, and

(ii) through a comparative study of structure, policy and similar processes to technical education and training in Nigeria and the Republic of Korea (South Korea), propose a structural model and some policy refinements for Kenya.

Specific research questions which the study attempted to answer were:

1. To what extent does the structure of technical education and training in Kenya promote or inhibit career advancement?

2. What are the policies of technical education and training in Kenya and what are their specific influences to career advancement?

3. What influence have the following processes or practices had on career advancement in technical

education and training in Kenya: financing, recruitment, examination, certification and promotion?

4. What are the structures, policies and processes of financing, recruitment, examination, certification and promotion in Nigeria and the Republic of Korea? What are the major differences and similarities as compared with Kenya?

5. Is there any difference in the level of aspiration for further education and training between Artisans, Craftsmen and Technicians in Kenya?

6. What is the career opportunity index (chances of admission to further education and training) of Artisan, Craftsman and Technician in Kenya?

7. What structural and policy refinements in the Kenyan system of technical education and training would facilitate career advancement of technical graduates either within the formal school system or upon initial employment?

Significance of the Study

The significance of this study may be stated at two major levels. Firstly, the study will be a useful source from which policy makers can choose from a range of alternative solutions to tackle some problems in technical training, especially those related to opportunities for further education. Most of the past research in the area of technical education in

Kenya have been exclusively intra-national. This study therefore will be a contribution to the few studies in this area that have applied a comparative methodological approach, and drawn conclusions in the light of experiences in other countries.

Secondly, the 8-4-4 system in Kenya places great emphasis on vocational and technical education. At this relatively early stage of its implementation, much attention is given to careful planning that will cater for the majority of pupils who will venture into technical careers and who will enter the system at various levels. By analysing the shortcomings of the previous system, and inadequacies in the present system with direct bearing on career advancement in the technical field, the study will make a contribution to the successful functioning of the 8-4-4 system.

Limitations of the Study

This study considers only the formal or institutional aspects of technical education and training. The informal sector, such as the "JUA KALI" enterprises (garages or workshops that are mainly open-air establishments), though important in Kenya are not the concern of this study. Whereas most data for

Kenya drew mainly from primary sources, that of Nigeria and the Republic of Korea was mainly from secondary sources. This problem was inevitable given the limitation of time and money which could not allow the researcher to travel to reference countries or other important documentation centres from which primary sources could be easily accessible to. Further, some shortcomings apparent in the literature published by international agencies such as UNESCO, World Bank and the International Labour Organization (ILO), from which a considerable amount of data came and hence conclusions so derived based, may be reflected in this study. Shortcomings in such literature may be attributed to two reasons: these agencies, given their particular positions in which they are bound by the UN charter under which they were established, have the tendency not to interfere with internal affairs of individual countries, especially through the publication of very critical literature; and most of their publications, especially UNESCO, are based on official governmental reports, which tend to portray the positive aspects of the implementation of educational policies.

This study, among other tasks, tried to establish the relationship between further education and training received and prospects of promotion in technical careers.

The best approach to such a study would be a longitudinal tracer technique. However, for the same reasons stated earlier (time and funds), the researcher would not venture into that approach. Chapter 3 will show that the survey results had three limitations: sampling defects, use of descriptive statistics and lack of comparisons with Nigeria and South Korea as the questionnaire could not be administered in these reference countries or similar information obtained.

Reference Countries

The reference countries chosen for this study are Nigeria and the Republic of Korea. Nigeria was selected to represent an African country with various characteristics similar to Kenya. Both countries (Kenya and Nigeria) were under the British colonial rule and gained independence at about the same time: Kenya in 1963 and Nigeria in 1960. Further, both countries faced an acute shortage of skilled manpower at independence, a problem that has persisted, and also suffered regional imbalances in the provision of educational opportunities. Whereas both Kenya and Nigeria have made great efforts towards the achievement of Universal Primary Education they still have to contend with the problem of planning for the education and training of the majority of students who do not pursue higher education through

the formal academic routes.[15] This is largely due to the high rate of population growth in both countries: Kenya 4.1% and Nigeria 3.3% per annum.[16] Indeed the ratio of pupils who proceed to higher levels of education via the formal academic route in Nigeria compares well with that of Kenya. It is estimated that for Nigeria, only 28% of primary school pupils proceed to secondary school while only 3.3% of secondary students proceed to university.[17] The corresponding figures for Kenya are 35% and 3% respectively, as noted earlier.

The Republic of Korea is known for being an innovative country which "... has suddenenly appeared at the centre of international limelight as a most dynamic, newly industrializing country".[18] This is the same country which in 1945 (at its independence),

> had a national illiteracy rate of 80%, ... found itself with no technicians, little industrial equipment and a few people to operate it, and other problems of language, availability of training institutes and concomitant problems of recruiting and training effective technical and vocational teachers.[19]

Whereas the educational system of Korea operates to allow the majority of primary school leavers to proceed to secondary school level through the formal academic route, it experiences a relatively high drop-out rate at secondary level.[20] Only 23.9% of secondary

school leavers proceed to university. Hence, like Kenya, alternative routes have to be provided for the majority of secondary school leavers to climb the educational and professional ladder. Further, Kenya's present stage of development, that relies largely on agricultural production while striving to enhance its manufacturing sector, compares well with Korean experience in the early 1960's, when its growth consisted mainly of agricultural and manufacturing activities geared to the domestic market.

Like Kenya, the Republic of Korea has a strongly centralized government. Despite the current attempts of decentralization, Kenya through the District Focus for Rural Development and Korea through the establishment and re-structuring of the Provincial, District and Municipal Boards of Education, this commonality in the administrative structure would be reflected in the formulation and implementation of major educational policies.

Korea was therefore chosen to represent a developing but fast industrializing country outside Africa, with a longer history of technical education and training than Kenya, but which has tackled and is tackling similar problems in this field.

Methodology

In this study, the Problem Solving Approach as developed by Brian Holmes will be applied, with slight modifications where necessary. The approach involves four major steps: problem selection and analysis; formulation of policy proposals or possible solutions; identification of relevant factors; and prediction.

In selecting a problem, "the main assumption is that the problem is common or universal and that comparative analysis across national or cultural boundaries will elucidate it and suggest possible solutions".[21] Analysis (intellectualization) of the problem aims at its clarification as well as a clear focus on the type of data to be collected. This step, however, is not unique to Holmes' approach as all research starts with or identifies a problem to be solved. But for convenience, brevity and other reasons stated later Holmes Approach has been used. For the purpose of this study, problem analysis or intellectualization constitutes: (i) the "Background to the Problem" and the justification of choice for "Reference Countries" both of which have been tackled in this chapters; and (ii) Literature Review (chapter 2).

Having selected and analysed the problem, the next stage involves the formulation of policy proposals or possible solutions. As Holmes points out, "one task of comparative analysis is to make clear the range of policy choices available, and another is to propose more realistic solutions through refinements in the process of analysis".[22] Thus this stage involves the selection of a range of realistic policy choices considered as possible solutions to the problem analysed in stage one. The researcher's task at this level is to look to practices in what are 'reference' countries to the one in which the problem is centred.[23] In this study, this stage comprises:

(i) An analytical presentation of the structure of technical education and training in Kenya. Focus is on vertical and horizontal linkages between various levels and institutions. Structural shortcomings as related to career advancement are identified;

(ii) Identification and analysis of policies of technical education and training in Kenya, as well as the processes of financing, recruitment, examination, certification and promotion, with specific reference to their influence to career advancement;

(iii) An analytical presentation of the structure, policy and processes of financing recruitment, examination, certification and promotion in technical education and training in Nigeria

and the Republic of Korea. A comparison between each of the reference countries with Kenya in order to identify major similarities and differences; and

(iv) Formulation of policy proposals or possible solutions to the problem in Kenya.

The identification of relevant factors which are likely to influence the outcome of any of the policy proposals made, constitute stage three. In this study, the specification of circumstances under which prediction is to be made includes the identification and analysis of the initial conditions: economic factor; societal values and attitudes; demography; and external influences. Further, weighting of the selected factors is made as they are expected to be of varying significance or influence.

Prediction, which is the final stage, involves the establishment of proposals deemed most reasonable or most likely to solve the problem. This is done by testing the alternative policy proposals available against the context advanced above.

A treatise on various methodological approaches to the study of comparative education such as those advanced by G. Bereday, H. Noah and M. Eckstein, and

Holmes, just to mention a few, is in itself a subject of research beyond the scope of this study. However, it suffices to give a brief justification for the adoption and adaptation of Holmes Problem Solving Approach.

The Problem Solving Approach has been considered most suitable for this study on the grounds that it is both forward looking and "Scientific". Unlike the Historical method which emphasizes antecedent causes as a basis of understanding, this approach emphasizes prediction and verification. It provides a suitable framework of analysis for this study which sought not just to analyse 'causes' of the present shortcomings in technical education and training system but also to predict the outcomes of the policy proposals made when implemented. This method is 'scientific' because it involves hypothesis formulation and verification. However, hypothesis formulation here implies the formulation of alternative policy proposals while verification implies prediction of consequences.

Whereas Noah and Ecksteins' method as described in the book Towards a Science of Comparative Education, (1969), is scientific, it differs from the problem solving approach technically at the level of comparison. Noah and Ecksteins' method basically involves formulating

a hypothesis about a relationship between education and society, and then testing that hypothesis by the use of cross-national data. On the other hand, Bereday's approach involves mainly four phases: description, explanation or interpretation, juxtaposition, and comparison. According to Bereday, one would first collect all pedagogical data available on a chosen topic and then apply various methods of other social sciences to interpret the data. Through juxtaposition, criteria for comparison is achieved through the establishment of a unifying concept or hypothesis. Then comparison would finally be made through a simultaneous analysis of established concepts across national boundaries. Clearly this approach would be time consuming and relatively expensive. However, in applying Holmes approach, most of the phases of Bereday's approach have been included at varying degrees and stages. It is in the light of this that the Problem Solving Approach which involves an analysis of practices in reference countries from which policy proposals are formulated for the country where the problem is centred was found most suitable.

Data Collection and Analysis

In this study, data collection involved three major procedures: the study of relevant literature;

interviews; and use of questionnaires. The Literature studied consisted of:

(i) Government official publications: Development Plans; Annual Reports by Ministries of Education; Economic Surveys; Sessional Papers; and Reports by various Commissions appointed by the government.

(ii) Publications by international agencies: Unesco, World Bank and ILO.

(iii) Theses and Dissertations on technical education and training.

(iv) Reports of International Conferences organized by Unesco and the Commonwealth Secretariat.

(v) Journals and Newspapers.

Interviews were used to update and supplement information obtained through the study of literature mentioned above. The researcher carried out personal interviews with the following people:

- Education Attache at the Embassy of the Republic of Korea and the Nigerian High Commission in Nairobi.

- Members of the Technical Education Project (TEP) Committee based at the Kenya Institute of Education. This Committee has been preparing curricula for craft training centres,

Post-secondary technical colleges and National Polytechics.

- Principals of two Technical Institutes and Officials at the National Industrial Vocational training Centre (NIVTC) and the Directorate of Industrial Training (DIT) were interviewed.

Two types of questionnaires had been proposed: postal questionnaires to be sent to selected technical institutions in the reference countries; and another type to be administered to a sample of trainees in Kenyan technical institutions. However, no questionnaire was sent to reference countries due to the limittation of funds and time in the course of the study. But a survey based on the administration of questionnaires was carried out in Kenya. The results are analysed in chapter 3.

Data analysis involved both qualitative and quantitative dimensions. At the quantitative level, it involved basically descriptive statistics: Percentages and ratios. To facilitate comparison and analysis of data, tables, charts and diagramatic representations of structure were used.

This chapter therefore gives us an introduction to the whole study. In the next chapter, we shall review the literature on technical education and training.

DEFINITION OF TERMS

Structure

For the purpose of this study, structure refers to the provision of paths or routes within the education and training system, with clearly defined linkages between levels, areas and institutions that allow a school-leaver, of whatever level, to climb the professional ladder to the very highest qualification available.

Policy

For the purpose of this study, this will refer to broad goals or guiding principles for intended outcome. It may be inferred from aims and objectives of technical education and training, as well as legal documents.

Career Advancement

This refers to the upward movement of an individual to clearly defined stratified stages within a (technical) profession, regardless of the point of initial entry, through formal technical education and training.

Technical Education

In this study, the UNESCO definition of technical

education as "formal education designed to provide knowledge and skills underlying production processes" will be adopted. However, only engineering trades (electrical, mechanical, building, etc), will be included in the study.

Pre-vocational Education

Refers to instruction in craft and trade skills offered within the formal primary and secondary school system.

8-4-4

This refers to the educational system or structure in Kenya, adopted in 1985 which entails eight years of primary education, four years of secondary education and four years minimum university education.

Vocational Training/Pre-vocational Education

Vocational training refers to programmes which are directed at the acquisition of specific occupational skills to be applied in solving particular tasks in that vocation. Pre-vocational education, however, is generally aimed at introducing students to the knowledge, skills and attitudes relevant to various occupations.

Reference Countries

These may also be called comparing countries, chosen for purposes of cross-national comparisons, not for the excellence or superiority of their technical and vocational education systems over that of Kenya.

Vocational Training/Prevocational Education

Vocational training refers to programmes which are directed at the acquisition of specific occupational skills to be applied in solving particular tasks in that vocation. Pre-vocational education, however, is generally aimed at introducing students to the knowledge, skills and attitudes relevant to various occupations.

Reference Countries

These may also be called comparing countries, chosen for purposes of cross-national comparisons, not for the excellence or superiority of their technical and vocational education systems over that of Kenya.

FOOTNOTES

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CHAPTER TWO

REVIEW OF RELATED LITERATURE

CHAPTER TWO

Review of Related Literature

Introduction

This chapter comprises three sub-sections. In the first sub-section, we shall review the most recent publications by UNESCO and the World Bank on Education and training policies in sub-saharan Africa. Apart from facilitating our understanding of general trends in education and technical or vocational training in Africa, this sub-section will highlight the current policies for educational development advocated by UNESCO and the World Bank. The importance of these two bodies, in educational developemnt cannot be over-emphasized.

In the second sub-section, we shall review the reports of various commissions appointed by the government to review different aspects of the educational system in Kenya. However, we shall only consider the commissions that was appointed after Kenya's independence. Further, only the technical and vocational aspects of the reports will be examined.

Finally, in sub-section three, we shall give a critical review of the various studies on technical or vocational education carried out by individual researchers in Kenya.

World Bank and Unesco Reports

The World Bank's contribution to educational development in Africa has taken mainly two forms: through direct lending to individual governments; and through financing of various educational research projects. One of its recent major policy studies is contained in the report: Education in Sub-Saharan Africa, of 1988. The study had three main objectives: to identify and describe common problems and issues of educational development in Africa; to provide leaders in each country with comparative data and analytical tools for developing their own policies and priorities; and to suggest specific policy directions for consideration by national education authorities and by donors.

According to the study, the major challenges currently facing educational development in Africa are threefold: explosive population growth; stagnation of enrolments; and erosion of educational quality. Consequently, the problem of accessibility to educational opportunity is expected to persist, at varying degrees, in many African countries.

Three policy recommendations have been given by the World Bank as possible strategies of meeting these challenges. The first one is the "adjustment to current demographic and fiscal realities".[24] This entails increased cost-sharing in public education, increased

privatisation of education, and unit cost containment. The second strategy is revitalization of the existing educational infrastructure. This entails "a renewed commitment to academic standards, principally by strengthening examination systems",[1] among other things. The third strategy is the selective expansion of educational services, notably through the provision of Universal primary education, the establishment of distance education programmes as an alternative route to further education, and increased training for those who have entered the labour force.

Regarding technical and vocational education, the World Bank is in advocacy of general education as the main component of the secondary and post-secondary curriculum and job-specific or occupational training as a preserve for post-school institutions. In more specific terms, the report states:

> Because of the high costs and tenuous vocational relevance of much school-based training for specific jobs and occupations, there is an urgent need to establish industrial training centres and to encourage (through incentives and technical assistance) local enterprises to offer skill development programmes and other types of on-the-job training. Governments interested in laying the groundwork for a more technically oriented economy should place heavier emphasis on general mathematics and scientific skills in the secondary and post-secondary curriculum. These programmes

> are relatively inexpensive and are generally more conducive to economic growth than is in-school vocational education.[2]

While the report argues that international experience shows that a strong general education greatly enhances an individual's future trainability, no attempt is made to give specific data or reference in support of that argument. Elsewhere in the report, reference is made to the Federal Republic of Germany and Japan, but both are notably outside Africa. Further, such policy which prescribes general education for primary and secondary school levels, and vocational training in post-school institutions only (industrial training centres and on-the-job training in firms) may not be feasible in Kenya for two main reasons.

Firstly, considering the present economy, neither the established technical training institutions nor firms and other industrial enterprises have the capacity to absorb all school leavers in need of such training. Secondly, in view of the rising rate of unemployment, especially in the formal sector establishments, most school leavers will be forced to venture into self-employment activities especially in the informal sector.

Clearly, the most urgent need for such individuals would be the acquisition of vocational skills relevant to the economic environment within which they will operate after school. Introduction of such skills within the formal school curriculum at a level where the majority of a nation's population reaches would be, in my opinion, a better strategy than emphasizing future trainability when most individuals may never have such opportunities for further formal training. However, the World Bank rightly acknowledges that some policies may work successfully in one country but not do so in another.

One comparative study was carried out by G. Pscharopoulos and W. Loxley (1985) under the auspices of the World Bank. This study was designed to evaluate the impact of diversification of the secondary school curriculum to national economic development. A comparison was made between Tanzania and Columbia. The study focused on a random sample of 10,000 students following either diversified or conventional (academic or vocational) curricula, just before graduation and then a follow-up after 1-3 years after graduation. The aim of the follow-up was to establish what further education the students had received and what their experiences in the labour market had been.

The evaluation of the two types of curricula (diversified and purely academic or vocational) was made based on the following factors: equity (in terms of access to the different types of schools by students with different socio-economic origins); internal efficiency; external efficiency; and economic efficiency. The study concluded that:

(i) diversified schools have higher internal efficiency but are more expensive than conventional schools,

(ii) graduates of diversified schools do not find jobs more easily and do not earn more than the graduates of conventional schools.

While the study provides important findings as pointers to the efficiency of the two types of secondary school curricula, its sample consisted of students who had completed a very short period after graduation. This is a weakness rather than strength to the study. It would be necessary therefore to carry out similar longitudinal tracer studies which take into account students of longer post-graduation periods of experience, and more developing countries with various economic and socio-political structures.

In UNESCO's recent publication: Education and Training Policies in Sub-Saharan Africa, (1987), Several issues are discussed. The report evaluates

the educational developments in sub-saharan Africa for the period 1960 to early 1980's. Further, the economic situation is examined and guidelines for socio-economic development suggested. The report then analyses education in the context of integrated development and finally gives some strategies for policy implementation.

While acknowledging the various forms of qualitative and quantitative achievements in education, UNESCO still identifies four major challenges to educational developemnt in sub-saharan Africa. The first problem is related to demographic trends: high growth rates; population movements such as rural-urban migrations; and demographic structure. For instance, it is estimated that "Africa has the highest percentage of young people under 15 years of age (45.2% as against 22.8% in the developed countries)".[3] This has many implications, but we shall not discuss them here for they have been well analysed in the original report.

The second problem cited is wastage through repetition, dropping out and failure in examinations. The report lists lack of qualitative and quantitative data for planners, due to inadequate financial and human resources allocated to educational research institutions, as the third problem, and the cost and financing of

education as the fourth.

The report argues that due to the increasing recognition of the interaction between education and the economy, education policies and plans should be an integral part of development plans.[4] Further, it attributes the present economic crisis in Africa on both external factors (world inflation and terms of trade) and intra-national factors (political instability and class structure). However, UNESCO is critical of the World Bank's Structural Adjustment Programmes (SAP), arguing that such strategy will widen the gap of opportunities for access to education which already exists between groups. In more specific terms, the report states:

> The structural adjustments recommended for dealing with the crisis entail proposals to limit the budgetary resources allocated to education. The groups which are already disadvantaged are thus in danger of becoming even more so as regards opportunities for access to education. Yet it is precisely through investiment in these potential human resources, and through the growth of the economic sectors where these skills may be used, that the democratisation of education and economic and social progress can be ensured.[5]

Regarding technical and vocational education, UNESCO seems to be in agreement with the World Bank in as far as the importance of general education

is concerned. However, unlike the World Bank, UNESCO does not advocate the relegation of technical and vocational training to post-school establishments. Rather, it suggests a flexible approach: the inclusion of technical and vocational education within the general education curriculum, or its developemnt as separate and specific instructional programmes. This is reflected in one of the recommendations adopted by UNESCO, which arose from the Conference of Ministers of Education and those responsible for Economic Planning in African Member States (MINEDAF V), organized by UNESCO in 1982 in Harare, Zimbabwe, which states:

> Member states are recommended to ... develop technical and vocational training, either in specific institutions or as part of general education, attaching due value to their social and economic importance; and ensure that technical education and vocational training are preceded by a sufficiently long course of general education and are made to some extent polyvalent, and that the specialized section of the course is organized in conjuction with the professional circles concerned.[6]

Consequent upon the analysis of the World Bank and UNESCO Policy reports given above, the following observations may be made:

(i) There is general agreement that a strong background of general education, which emphasizes mathematics, language and

scientific principles is important as a basis upon which technical and vocational training should be built.

(ii) While there is little disagreement about the importance of technical and vocational education and training for national development, there seems to be no universal agreement as to whether it should be offered in shools or only in post-school institutions, including firms. And if it is to be offered in schools, whether a diversified curriculum or a purely technical curriculum parallel to the academic one should be followed.

However, despite the World Bank Report and the study carried out by Pscharopoulos and Loxley (1985), which tend to cast doubts over the worthiness of the diversified school system, most countries seem to be moving towards greater diversification, with an increasing vocational component in the general education curriculum.

(iii) Educational development in Africa is currently faced by many challenges. However, for our present study, we consider two to be crucial: demographic trends, as well as the cost and financing of public education and training. Both factors have direct implications to career advancement, which is the main concern of this study. We shall examine further these factors in the Kenyan Context at a

later stage of this study.

Having analysed the challenges to, and strategies for the development of education and training in Africa as a region, as reflected in the reports by the two international gencies, we shall now focus our attention on Kenya. First, we shall review some reports by various commissions.

Government Policy Documents

The Kenya Education Commission, popularly known as the Ominde Commission, was appointed shortly after independence and submitted its report in 1964. The Commission was to survey the then existing resources of Kenya and hence advise the government in the formulation and implementation of national policies for education which among other things: would take account of the need for trained manpower for economic development and for other activities in the life of the nation; respect the educational needs and capacities of children; and provide for the principal educational requirements of Adults.

In its assessment of the curriculum, the Commission noted that little more than lipservice was paid to training in the practical skills, citing lack of workshops or Art-rooms in most secondary schools as evidence. In apparent reference to society's negative attitudes

to pre-vocational education, the Commission noted:

> It is ... a damaging error to suppose that the manual skills are appropriate only to workmen and are no concern of the school certificate boy or girl, [for] it is not without siginificance that, in developed countries, a large proportion of scientists and engineers are competent craftsmen in their own right.[7]

The Commission clearly emphasized the need for pre-vocational education and went ahead to suggest that it be made compulsory rather than an option, especially to students pursuing scientific courses. More specifically, the report said:

> Here, we wish to express our conviction that a workshop for wood work, or a craft room for the practice of fine art, is a necessary part of the equipment of any secondary school. Further we would urge that the use of these facilities must not be regarded as a voluntary option, an extra-curricular activity, something that can be pushed aside whenever there is 'more important' work to be done. We insist that an art or craft, should be taken as a subject at the ordinary level of the school certificate by all children likely to opt for a science course in the higher certificate, and perhaps by most other children as well.[8]

On education and training, the Commission argued that no precise line could be drawn between the two, since they played a complementary role to each other. Further, it recommended the establishment of systematic industrial training schemes as a substitute for the

hitherto haphazard and unsatisfactory methods of picking up skills at the bench. Thus the commission was in advocacy of formalized technical and vocational training. To achieve this goal, greater co-operation between the government and industry was emphasized.

The Commission also urged universities to give explicit recognition to City and Guilds Ordinary Certificates and Diplomas as alternative university entry qualifications, in order to establish the polytechnic as a recognized channel of entry through its technician courses.[9] Clearly, this was an attempt to expand career advancement opportunities for technicians. However, the commission also recommended a cautious and selective expansion of further technical colleges based strictly on projected demand as may be revealed by periodical manpower surveys, arguing that excessive expansion of facilities, and numbers of students involved would result in skilled unemployment and could be even politically dangerous.

We may draw three conclusions from this report. Firstly, the commission clearly indicated that there were problems of career mobility especially within the technical profession. Particularly, the transition from lower technical qualifications obtained at the polytechnic to higher professional qualifications at

the university was lacking. Secondly, the Commission was in favour of formal technical and vocational training tailored along systematic industrial schemes, as opposed to unplanned or informal ways of picking up skills. Thirdly, the general importance of technical and vocational education and training, both within schools and other post-school establishments was stressed.

The second major official evaluation of the Kenyan system of education was carried out by the National Committee on Educational Objectives and Policies, which was appointed in 1975 and submitted its report in 1976. The objetives of the committee were threefold: to evaluate the then present system of education; define a new set of educational goals for the next decade of independence; and to formulate a specific programme of action for achieving those goals.

The committee raised various issues, one of the crucial one being the mismatch between the actual jobs and skills required on the labour market and the type of attitudes and skills prevalent among the school-leavers. As a means of redressing this mismatch, the committee recommended the inclusion of pre-vocational craft-oriented skills, including small-scale business techniques, in order to encourage

self-confidence, creative ability and evaluative capacity.[10]

In view of the close linkage that had developed between job opportunities and academic certification, which according to the committee had to be discouraged, the following recommendations were given: a de-emphasis on job rationing by educational certification and promotion on the basis of academic advancement; and creation of promotional and retraining opportunities for upward mobility for all employees regardless of the level at which their formal education was terminated, as well as mobility for occupational opportunities on the basis of merit rather than just formal schooling. Further analysis of the report shows that the committee saw the manipulation of legislation as a sure way of enforcing or bringing about the anticipated reforms.

At the primary school level, the committee recommended reforms of both the structure and content. Regarding the structure, the commitee suggested that the duration of primary education be extended from 7 to 9 years. This, the committee argued, "would enable primary school leavers to be more mature and would rationalize the [then] current extensive practice of repeating one or two years before a child offered to sit the CPE".[11] Further, greater diversification

through the increased teaching of pre-vocational subjects was recommended.

Perhaps the most notable feature of the report regarding technical education, was the committee's recommedation for a halt on the planned expansion of technical secondary schools, as their viability for job preparation was questionable. In a clear reference to problems of mobility, the committee noted that even students going through such schools were "experiencing difficulties in finding employment and further technical training".[12] Consequently, the committee called for the conversion of technical secondary schools into a post-school system which includes VP's, NYS, NIVTC and industrial schools within firms, and being all under the supervision of the DIT.

In view of the above discussion, we may partially conclude here that: the committee extensively analysed unemployment problems among school-leavers; recommended various structural and policy measures; and highlighted the issue of the apparent lack of mobility among graduates of technical secondary schools. It also tried to deal with the factors hindering career advancement of those initially employed. For instance it noted that while the future of a vocational trainee depended on the general preparation he got to give him

maximum vocational mobility as well as acquisition of skills for immediate employment,

> some industries are reported to be giving their vocational trainees the kind of training that forces them to remain employees of that particular industry. This comes about as a result of giving the trainees training and qualifications that may not be recognized beyond that particular industry, thereby enslaving the trainee in an effort to avoid loss to other occupations.[13]

However, the committee's major pre-occupation was the transition from school to work. Further, while the committee called for better co-ordination between the university and polytechnics, with regard to the abolition of the demarcation between academic subjects at the university of Nairobi and technical courses at the polytechnics, it remained largely silent on prospects of transition for graduates from polytechnics to universities.

The Presidential Working Party on the Establishment of a Second University in Kenya (1981) carried out the third major review of the educational system in Kenya. Among its terms of reference were: to recommend a philosophical framework, concept and objectives within which the university could best serve the interest of the Kenyan society; to examine the relationship of the proposed university with the

university of Nairobi and other post-secondary institutions, so as to ensure that the proposed university would play a complementary role to these other institutions; and to recommend ways in which the proposed university could play a role in programmes of continuing education in the country.[14]

In its deliberations, however, the party reviewed extensively the entire education and training system at all levels, with special emphasis on post-secondary level.

Regarding the national polytechnics, the party deplored the practice of restricting students' admission to employer sponsorship. Hence it recommended that "admission policies be liberalized to allow other students not specifically attached to employers to take advantage of those training opportunities".[15] The Working Party also noted that need existed for the harmonisation of curricula, examination and certification in Harambee Institutes of Technology.

Refering to the apparent lack of clear vertical linkages among institutions, the Party noted:

> It is questioned by the informed public whether there is a need to do a full course of study at each stage, as a student progresses from

> a lower training institute to a higher one and to the university. The Working Party has come to the conclusion that it is necessary to harmonize the curricula of training institutions at various levels so that credit is given by the higher institutions for relevant work done in lower institutions.[16]

Consequently, the Working Party recommended the establishment of a Council on Higher Education whose functions would be: accreditation of universities; and the harmonization of the examinations and certification of all post-secondary institutions upto the university level.[17]

While the Working Party acknowledged the need to increase the production of technological manpower at the professional engineer, technician and craft levels, it did not specifically discuss how craftsmen should be able to rise to the level of engineers. Since the proposed university was to have a technological orientation, one would have expected the Working Party to give some specific recommendations regarding the transition of graduates from polytechnics to the university. Instead, the party only called for a general harmonization and co-ordination as stated above. In this respect, therefore, the Party did not adequately deal with prospects of career advancement of technical graduates entering the professional ladder at lower levels.

The Working Party clearly opposed the establishment of an 'Open University' but was in favour of a college of continuing education, arguing that:

> An 'Open University' depends heavily on the existence of an efficient infrastructure, such as a postal system that can return mail within 24 hours and heavy concentrations of population which are not found in most parts of Kenya.[18]

We shall discuss this concept of 'Open University' in chapter 5 of this study.

In conclusion, this review of Reports has identified the following common features, which we consider important to the present study: they all stressed the importance of technical and vocational education and training at all levels of the education system; they all pointed out, either explicitly or implicitly that there were problems of vertical mobility among technical graduates; and they all called for greater harmonization and co-ordination of higher education and training in Kenya.

We shall now review some available literature on research carried out by individuals, on various aspects of technical education and training in Kenya.

Empirical Research Reports

In his study, W. Kangethe (1985) evaluated the

technical secondary school curiculum in Kenya by comparing technical secondary school graduates and academic secondary school graduates. The aspects of comparison included: performance in post-secondary technical programmes; job performance; and career progression profile. Among important findings, was the fact that technical secondary school graduates do not necessariry perform better either in post-secondary technical programmes or on job, and that academic secondary school graduates have a greater career progression profile.

In concluding the study, Kangethe recommended the discontinuation of technical secondary schools and their subsequent conversion into academic schools. He further suggested that existing facilities in technical schools be converted into post-school facilities or be transferred to institutions of higher learning, and post-secondary technical training facilities widened.[19] However, whereas the study established the fact that technical secondary school graduates had a relatively poor career progression profile, it did not analyse specific factors that hinder the advancement of these graduates, especially as related to further education and training. Further, the researcher sought predominantly the views of employers but not employees.

In another study, Sifuna (1982) analysed the techncial secondary school-leavers and employment opportunities in Kenya. The major purpose of the study was "to examine the rationale of the government's heavy investment in the expansion and formalisation of technical secondary education as a way of combating the problem of school-leaver unemployment".[20] The study focused on a random sample of 726 students from eleven of the then fifteen technical schools. A questionnaire was administered to the sampled students to obtain information such as socio-economic background, educational, and career aspiration.

A significant finding was that 43.1% of the sampled students aspired to become engineers, 20.1% did not intend to pursue a technical career, while only 29.5% aspired to become artisans. It was also found that multinational companies were reluctant to employ technical secondary school graduates for they considered them relatively expensive. Further, technical secondary school graduates were found to face unemployment problems largely similar to those from the academic schools.

For the present study, perhaps the most important observation from Sifuna's study is the finding that most students from technical schools were "Keenly interested in opportunities for further training and

prestigeous occupations that afford mobility".[21] This study clearly established the aspirational orientation of technical students. However, it does not attempt to compare the level of aspiration between artisans, craftsmen, technicians and engineers. Thus further investigation needs to be done in order to answer the question: could the apparent lack of educational mobility among artisans or craftsmen be attributed to their lack of aspiration for further training?

A.G. Ferguson and D. Barker (1978), carried out a study on village polytechnics. The main purpose of the study was an assessment of the performance of Village Polytechnics (VP's) in Central Kenya with regard to: promotion of rural development; attitude of trainees to employment prospects in rural areas and city; and the extent to which the success of VP's is dependent on the standard of living in rural areas.

The study found out that most of the trainees interviewed desired to work in their home areas and that the role of VP's in promoting rural development was over-ambitious, since success of VP's tended to depend highly on the pre-existing level of rural prospects. They noted that there was "clearly a need for an alternative to formal education beyond primary school level and the VP movement was a credible answer

to that need".[22] They went ahead to recommend a horizontal expansion of VP's (diversification of their role) and discouraged attempts towards vertical expansion, i.e. admission of better (academically) qualified trainees and offering higher level courses.

Muchina (1986) analysed technical education and the small sector and informal sector development in Kenya. The purpose of the study was to establish the extent to which technical institutions of all levels have contributed to self-employment in Kenya. A number of problems facing both the institutions and their products (trainees) in establishing gainful self-employment were outlined. However, no attempt was made to analyse the relationship between graduates of those institutes and their prospects for further education and training.

H.D'Souza (1976) identified lack of terminal qualifications of marketable value among technical secondary school-leavers, lack of efficient co-ordination among various types of technical institutes, and unemployment of technical graduates as some of the major problems facing technical education in Kenya.

This brief review of some literature on technical education and training in Kenya leads to the following

observations:

(i) Most studies have focused on unemployment problems among school-leavers. Thus an analysis of transition from school to work has been appreciably done.

(ii) The impact of technical institutions on alleviating problems of unemployment has also been assessed. Quite notable are studies on Village Polytechnics (or Youth Polytechnics) and Harambee Institutes of Technology.

(iii) Practically, all studies have been exclusively intra-national, rather than taking a cross-national approach.

Despite the wealth of information we have on technical education and training, it is evident that little study has been carried out to examine the various routes available from lower levels of technical education to the status of full professional engineer, i.e. career advancement. This study will therefore be a contribution towards filling that gap.

In the next chapter, we shall discuss the results of a field survey on technical education and training in Kenya.

FOOTNOTES

1. World Bank, Education in Sub-Saharan Africa: Policies for Adjustment, Revitalization and Expansion. Washington D.C., World Bank 1988, p.2.

2. Ibid., p.3.

3. Ibid., p.5.

4. UNESCO, Education and Trainign Policies in Sub-Saharan Africa: Problems, Guidelines and Prospects. Paris, UNESCO, 1987, p.7.

5. Ibid., p.8.

6. Ibid., p.9.

7. Republic of Kenya, Kenya Education Commission Report. Nairobi, Government Printer, 1964, p.81.

8. Ibid., p.82.

9. Ibid., p.96.

10. Republic of Kenya, Report of the National Committee on Educational Objectives and Policies.

Nairobi, Government Printer, 1976, p.18.

11. Ibid., P. 52.

12. Ibid., p.64.

13. Ibid., p.91.

14. Republic of Kenya, Second University in Kenya. Report of the Presidential Working Party. Nairobi, Government Printer, 1981, p.(ix).

15. Ibid., p.20

16. Ibid., p.29.

17. Ibid.,

18. Ibid., p.55.

19. W. Kang'ethe, Technical Secondary Education Curriculum in Kenya: An Evaluation. Kenyatta University, Bureau of Educational Research, 1985, p.2.

20. D.N. Sifuna, Op. Cit., p.128.

21. Ibid., p.72.

22. A.G. Ferguson and D. Barker, "Village Polytechnics in Central Kenya: Progress, Problems and Prospects". University of Nairobi, Institute of Development Studies (IDS), Working Paper No. 359, 1978, p.9.

CHAPTER THREE

RESULTS OF A SURVEY ON POST-SCHOOL TECHNICAL EDUCATION AND TRAINING IN KENYA

CHAPTER 3

Introduction

In this chapter, we will first deal with the purposes of the survey and briefly summarize the overall conclusions. We will then discuss the methodology and show how the results were obtained.

The purpose of this survey was three fold: to establish the relative career opportunity index for an artisan, craftsman and technician; find out the level of aspiration for further education and training among artisan, crafts, technician and Higher National Diploma (HND) trainees; and analyse the current trends in recruitment and financing of technical education and training in post-school institutions in Kenya.

Briefly, the conclusions of this survey are that the education and training system favours those entering the professional ladder at higher levels but generally hampers prospects for career advancement of those entering it at lower levels after formal schooling. The relative opportunity index for an artisan is zero, craftsman 0.02, while that of a technician is very high at 0.79. Ninety-five percent of all categories of trainees aspire for further education and training. However, while 83% of HND trainees aspired for degree qualifications, only 37% of artisans did so.

The government policy of making trainees pay for their education and training will most likely reduce the numbers involved in training, especially at higher levels. Moreover, most employers are reluctant to grant their employees paid study leave and this is bound to have an adverse effect on upward mobility. While 100% of artisans and 74% of craftsmen are self-sponsored, only 27% of technicians and 44% HND are self-sponsored.

The present trend of recruiting artisan and technician trainees does not reflect favourably the government policy of increasing opportunities for primary school leavers who do not pursue higher education through the formal academic route.

Methodology

The results of this survey need to be verified because of the limitations of methodology.

The first limitation is based on the sampling technique. Owing to the shortage of funds and time, the sample was restricted to eight institutions only which are geographically dispersed in five of the eight provinces. This is a small sample considering that there are 320 government supported Youth Polytechnics, 18 Technical Training Institutes (TTIs), 17

Harambee Institutes of Science and Technology (HITs), 4 Industrial Training Centres (ITCs), 3 National Polytechnics, and other training programmes by individual ministries, Parastatal bodies, and other private agencies. Notably, a number of these Ministries, parastatals and other private agencies only recruit and provide initial or lower levels of training but sponsor the trainees to National Polytechnics for high-level courses. It follows therefore, that the sample does not entirely exclude respondents from those bodies.

However, the eight institutions, selected for convenience of administration and accessibility, should give a fair picture of the aspirations and relative career opportunity index of trainees at various levels of training as well as general trends in recruitment and financing of technical education and training.

The sample takes in three TTIs, one ITC, two HITs, one National Polytechnic, and one advanced post-secondary training college. Although most of the respondents are from the electrical, mechanical, building and civil engineering trades, a few are from irrigation and agricultural engineering trades.

Table 3.1 shows that out of 527 questionnaires administered, 491 or 93% were returned for analysis. This is a very high percentage indeed and it was so because the survey was administered by the researcher personally. The table also shows the total number of trainees interviewed at each level: artisan 129, craft 200, technician/ordinary diploma 100 and HND 62.

3.1: STATISTICS OF RESPONDENTS TO SURVEY

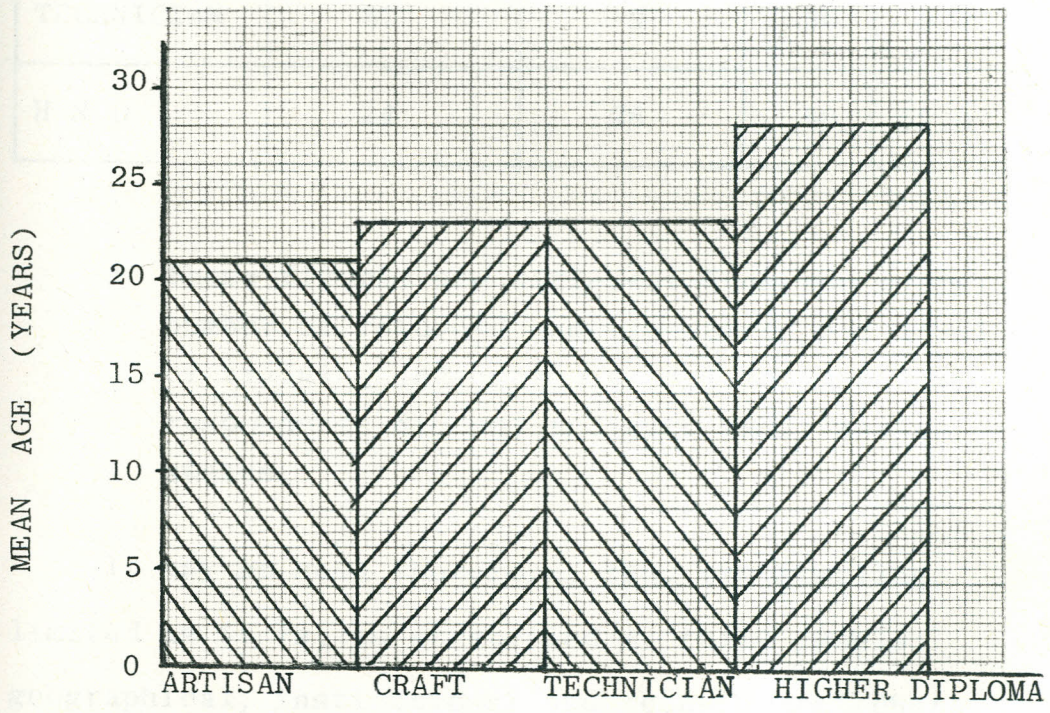
NAME OF INSTITUTE	NO. OF QUESTIONNAIRES ADMINISTERED	RETURNED	COURSES COVERED
SIGALAGALA TECHNICAL TRAINING INSTITUTE	53	52	ARTISAN . GENERAL FITTER . CARPENTRY/JOINERY . MASONRY
KISUMU TECHNICAL TRAINING INSTITUTE	50	50	ARTISAN . GENERAL FITTER . CARPENTRY/JOINERY
NAIROBI TECHNICAL TRAINING INSTITUTE	45	27	ARTISAN . CARPENTRY/JOINERY . GENERAL FITTER
		18	CRAFT II . MECHANICAL ENG. . MOTOR VEHICLE
NATIONAL INDUSTRIAL VOCATIONAL TRAINING CENTRE (NAIROBI)	51	49	CRAFT . ELECTRICAL INST. . MOTOR VEHICLE . MECHANICAL ENG.

3.1: Continued

NAME OF INSTITUTION	NO. OF QUESTIONNAIRES ADMINISTERED	RETURNED	COURSES COVERED
KIAMBU INSTITUTE OF SCIENCE AND TECHNOLOGY (KIST)	65	65	CRAFT . PLUMBING . MASONRY . ELECTRICAL INSTALLATION
RIFT VALLEY ISNTITUTE OF SCIENCE AND TECHNOLOGY (RVIST)	70	68	CRAFT . WATER TECHNOLOGY . AGRICULTURAL MECHANICS . BUILDING . CARPENTRY
JOMO KENYATTA UNIVERSITY COLLEGE OF AGRICULTRE AND TECHNOLOGY (JKUCAT)	90	60	TECHNICIAN . ELECTRICAL ENGINEERING . MECHANICAL ENGINEERING . AGRICULTURAL AND IRRIGATION ENGINEERING
THE KENYA POLYTECHNIC	41	40	ORDINARY DIPLOMA . ELECTRICAL ENG. . MECHANICAL ENG.
	62	62	HIGHER DIPLOMA . ELECTRICAL ENG. . MECHANICAL ENG.
TOTAL	527	491	

Figure 3.2 shows that the mean age of artisans was 21 years, craftsmen 23, technicians 23 and HNDs 28. The similarity of age among craftsmen and technicians may be explained by the fact that both levels of training recruit trainees from those who have completed at least form four. The relatively high average age of HNDs (28 years) as compared to university undergraduates (usually 22 years) is a reflection of the long and often difficult route that must be followed by technical students, who desire to advance in their career through formal education and training.

3.2: AVERAGE AGE OF RESPONDENTS



Most of the respondents below HND level were single and only at HND level 52% were married (see table 3.3). This is due to 'age factor'. As shall be shown at a later stage in this survey, most respondents view advanced age as having negative socio-economic implications to career advancement.

3.3: MARITAL STATUS OF RESPONDENTS

LEVEL	NO. OF SINGLE RESPONDENTS	NO. OF MARRIED RESPONDENTS	TOTAL*	% MARRIED
ARTISAN	121	4	125	3.2
CRAFT	179	9	188	4.7
TECHNICIAN	87	9	96	9.4
H N D	24	26	50	52.0

* These figures are different from the overall number of returned questionnaires per level of training indicated in 3.1 because some respondents did not indicate their marital status.

It may be seen therefore, that the sampling, limited as it is, is stratified at three levels: geographical, institutional and respondents' characteristics.

The second limitation of the finding is that descriptive statistics have been widely used. There is usually a danger of crowding individual characteristics of respondents when data is subjected to statistical analysis and description. In this survey, however, the researcher has used the statistical analytic technique selectively: only applying items most relevant to the variables under investigation and which give appropriate summary of findings. Hence the main statistical procedure involved the calculation of percentages, ratios, means, frequency tabulations as well as use of tables and charts.

The main instrument used in this survey was a questionnaire which had been designed consisting of 18 items (see appendix I). The researcher personally visited all sampled institutions. In all cases except one institution (Jomo Kenyatta University College of Agriculture and Technology), the questionnaires were supplied and the respondents filled them in the presence of the researcher. They were then collected. This was aimed at ensuring a high return rate. The poor return from Jomo Kenyatta University College of Agriculture and Technology, (JKUCAT), is explained by the exception noted above.

Data Analysis and Interpretation

Having discussed the methodology, we will now examine in detail the results of each item in the questionnaire.

Table 3.4, tabulates results obtained from item one of the questionnaire, which sought to establish the highest level of schooling each respondent had attained. Seventy six per cent of HNDs, 59% of technicians and 0.6% of craftsmen had completed 'A' level course, while 82% of artisans had reached form four. Thus only 18% of artisans were primary school leavers. The low percentage of primary school leavers being recruited in artisan programmes, and an equally low percentage of form four leavers in technician programmes, is attributed to the high competition among students leaving the formal school system at different levels for the few places available. Most 'A' level leavers who do not secure admission to degree courses at universities opt for diploma or technician courses whose minimum entry requirement is form four. Consequently, they are given preference over their 'O' level counterparts who may be vying for the same vacancy. The same thing happens at lower levels of technical training. This explains the observed trend whereby institutions concerned often recruit trainees with higher qualifications than the minimum intended

for any particular course.

3.4: LEVEL OF FORMAL SCHOOLING EXPRESSED AS PERCENTAGE OF TOTAL ENROLMENT BY LEVEL OF TRAINING

LEVEL OF TRAINING	PRIMARY (%)	SECONDARY "O" LEVEL (%)	SECONDARY "A" LEVEL (%)
ARTISAN	100.0	82.0	00.0
CRAFT	100.0	100.0	00.6
TECHNICIAN	100.0	100.0	59.0
HIGHER DIPLOMA	100.0	100.0	76.0

The academic performance of respondents is summarized in table 3.5. The mean score at CPE/KCPE by the different categories of respondents was: artisans 22 points, craftsmen 28, technicians 31, and HNDs 30. It may be observed that unlike the previous 7-4-2-3 system of education in which technical schools now designated TTIs recruited students with very high grades at CPE examinations into their programmes, the present TTIs recruit artisan trainees with very low grades at CPE and often those who have failed to secure a chance for form I in the formal school system. In the case of form IV artisan recruits, 21 had division three, 80 division four and 6 had failed. According to Sessional

paper no. 6 of 1988 on EDUCATION AND MANPOWER TRAINING FOR THE NEXT DECADE AND BEYOND, TTIs are supposed to exclusively train artisans recruited from Primary school leavers. The researcher asked the Principal of one of the TTIs to explain the apparent departure from the official stated recruitment policy. He attributed this phenomenon to two facts:

(i) a high number of form IV applicants who subsequently give stiff competition to primary school leavers; and

(ii) the expressed relative inability of primary school leavers to understand and appropriately apply basic principles of Mathematics and Science related to the trade they pursue. Even class-tutors agreed with these views stating that form IVs who had obtained at least division four did better than primary school leavers.

Apart from academic performance, the other factor governing recruitment of trainees is the District Quota System. Thus the number of trainees joining any TTI from every district is pre-determined. The allocation of vacancies to each district is based on the population of the district and the total number of vacancies available for a given year. This explains

why there may be variations in academic performance of trainees being admitted to the same course.

3.5: RESPONDENTS' ACADEMIC PERFORMANCE AT PRIMARY AND SECONDARY LEVELS

	CPE/KCPE Mean Points obtained*	'O' LEVEL		'A' LEVEL
		DIVISION obtained	NO. OF Trainees	
ARTISAN	22	1 2 3 4 Fail	0 0 21 80 6	Nil
CRAFT	28	1 2 3 4 Fail	2 41 116 29 3	Principal 1 Subsidiary 0 Fail - 0
TECHNICIAN	31	1 2 3 4 Fail	29 50 15 0 0	Principal 39 Subsidiary 16 Fail - 0
HIGHER DIPLOMA	30	1 2 3 4 Fail	23 25 7 0 0	Principal 32 Subsidiary 6 Fail 4

* For easy comparison KCPE points were divided by 2 to convert them to scale : 36 points CPE = 72 points KCPE Hence 1 point CPE is equivalent to 2 points KCPE.

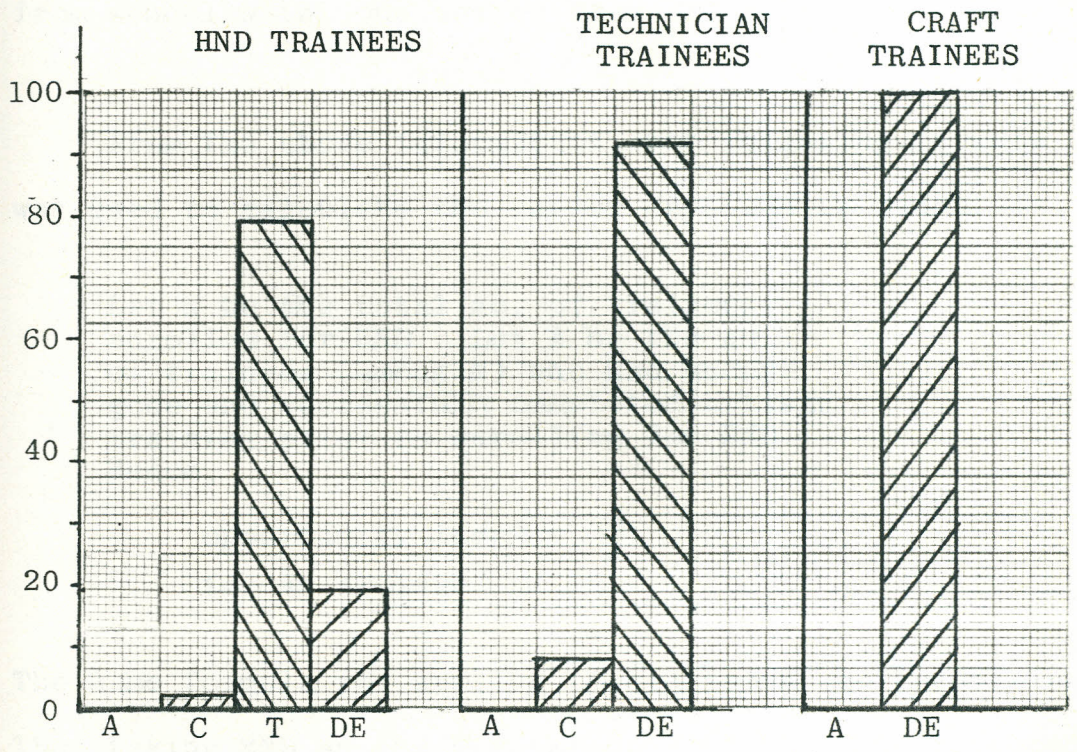
Recruitment into craft courses requires 'O' level division three as minimum academic requirement.

However, as the table shows, 29 of the respondents had division four and 3 had totally failed form IV examinations. All failures were from NIVTC - Nairobi while 12 of the division four holders were from RVIST, 3 from KIST and 13 from NIVTC. Admission requirements into craft courses at NIVTC and similar industrial training centres is more flexible than HITS. One of the senior officials at the Directorate of Industrial Training (DIT) who was interviewed by the researcher said the management does not put much emphasis on actual grades attained at '0' level. Rather the requirement is only that one must have completed '0' level course and should be physically fit. This partly explains the apparent departure of recruitment of craft trainees from the stated minimum qualifications. The only craft respondent who had reached 'A' level had studied arts instead of science subjects.

As shown in the table 3.5, most technicians and HNDs had attained principal passes at 'A' level examinations. Infact quite a number had achieved minimum requirements for university admission, i.e. two principals but due to scarcity of university vacancies, they opted for diploma or technician courses. The implication is that given an opportunity, they are capable of advancing through further education and training.

Figure 3.6 summarizes information obtained from items 4 and 5 of the questionnaire, which were designed to establish the career opportunity index of artisan, craftsman and technician. The career progression profile was obtained by analysing the courses previously completed by each category of trainees prior to admission into the course currently being pursued.

3.6: CAREER PROGRESSION PROFILE OF TRAINEES



KEY:

A - ARTISAN
C - CRAFT
T - TECHNICIAN
HND - HIGHER NATIONAL DIPLOMA
DE - DIRECT ENTRY FROM SCHOOL

The survey shows that HND intake consisted of 19% direct entrants from 'A' level school, 79% those who had previously completed technician or ordinary diploma course, 2% those who had previously done craft course, and none had done artisan course. The technician intake consisted of 92% direct entry from school, 8% those who had previously done craft course, while none had done an artisan course. The craft intake is even more striking: it consisted of 100% direct entry from school with none coming from artisans.

From the above information, the following formula was used to calculate the career opportunity index:

Let N be the total no. of trainees enrolled for HND. Let A be the no. of trainees (among N) who had undergone and successfully completed artisan training prior to enrolling for HND. Hence,

$$\text{opportunity index for an artisan} = \frac{A}{N}$$

The same formula was applied to craftsmen and technicians. Thus taking HND as the highest qualification on the scale shown in 3.7, the relative opportunity index for an artisan is zero, craftsman 0.02, while that of technician is 0.79. However, if a technician is taken as the highest qualification on the scale, the opportunity index for a craftsman is slightly higher at 0.08 but that

of an artisan is still zero (see table 3.7). This clearly shows that although it may not be shown in the official structure of the educational system, an artisan has relatively negligible openning for career advancement through further education and training in formal institutions.

3.7: CAREER OPPORTUNITY INDEX

ENTRY LEVEL (FROM)	SUBSEQUENT LEVEL (TO)	OPPORTUNITY INDEX (%)
ARTISAN	CRAFT	0.0
	TECHNICIAN	0.0
	H N D	0.0
CRAFT	TECHNICIAN	0.08
	H N D	0.02
TECHNICIAN	H N D	0.79

The financing of technical education and training is an important aspect with direct implications on career advancement. The different modes by which respondents were financing their studies are summarized in table 3.8. The survey shows that while 100% of artisans and 74% craftsmen are self-sponsored, the corresponding figure for technicians and HNDs was 29% and 44% respectively. The trend further shows that private

companies have a stronger bias of sponsoring the training of most low-level manpower as they were sponsoring 24% of craft trainees as opposed to 10% of technicians and 11% of HNDs. But the government seems to direct more emphasis on middle and high-level manpower, as it was sponsoring 43% of HND and 61% of technicians as opposed to 1.5% of craft and none of the artisan trainees.

This does not suggest that companies are depending mainly on low-level manpower but it may give a hint as to why there is a fairly high turn-over among graduates in government service who have higher technical qualifications. The fairly high percentage of HND trainees who are self-sponsored points to a marked departure of the polytechnic from its traditional system in which employer-sponsorship was a pre-requisite for admission into HND training programmes. Further analysis of individual institutions showed that both the government and private companies have not been utilising HITS for the training of their personnel. Companies prefer taking their craft apprentices to industrial training centres operating under the Directorate of Industrial training (DIT), despite the fact that a number of HITs have been approved by DIT. This partly explains why most HITs are operating below their optimum intake capacity. The specific factors leading to the reluctance

of companies to sponsor their trainees to HITS will be discussed in a later chapter of this study.

3.8: MODES OF FINANCING TECHNICAL TRAINING

LEVEL OF TRAINING	MODE OF FINANCING			
	SELF SPONSORED %	GOVERNMENT SPONSORED %	COMPANY SPONSORED %	*OTHER
ARTISAN	100	0.0	0.0	0.0
CRAFT	74	1.5	24.0	0.5
TECHNICIAN	29	61.0	10.0	0.0
H N D	44	43.0	11.0	2.0

* Refers to charitable organisations, e.g. Church, UNHCR and NGO.

At JKUCAT, 100% of respondents were government sponsored.

In order to find out the relative ease of admission to training institutions at the four levels of training the respondents were asked to indicate in item 7 of the questionnaire, the number of times they tried applying for the course before finally being admitted. As the table shows (see table 3.9), it is easier to gain entry into lower levels of training than it is at higher levels. For instance, 23% of HNDs had to make two or more attempts before admission into the programme as compared to 22% of the craftsmen and only 15% of the

artisans.

3.9: SHOWS NUMBER OF ATTEMPTS MADE BY RESPONDENTS BEFORE ADMISSION, EXPRESSED AS PERCENTAGE OF TOTAL ENROLMENT BY LEVEL OF TRAINING

	NUMBER OF ATTEMPTS AS %			
LEVEL OF TRAINING	1	2	3	4
ARTISAN	85.0	13.0	2.0	0.0
CRAFT	77.5	15.7	6.3	0.5
TECHNICIAN	81.7	11.8	6.5	0.0
H N D	77.0	18.0	5.0	0.0

The role of guidance and counselling in career choice and job placement was thought crucial to career advancement by the researcher. An attempt was therefore, made to compare the relative effectiveness of career guidance and counselling at school and post-school institutions, place of work (employer), community (parents, relatives, local administration etc), and the mass media, e.g. Radio, Newspapers and Television. Table 5.10 tabulates the information obtained. In some cases, respondents indicated more than one source from which they learnt about the existence of the course. Under such circumstances, a careful

analysis of the explanation they gave was made and then they were classified under the source which, in the judgement of the researcher, was most instrumental. For example, one respondent who said:

> I had always been told about the existence of this course by my subject teacher and career master at school. He always advised me to join this institution when I finish school. Then one day, I read in the Newspaper and I applied .....,

was classified under school category.

As the table shows, most artisans and craftsmen had the media as their main source of information while majority of the technicians and HNDs had the school as their prominent source of information. However, the majority who indicated school as their source of information explained that they only learned of the course through the career guidance booklets which are only supplied to them at the end or towards the end of their course especially in form IV. The insignificance of the employer as a source of information may be explained by the fact that a very high percentage of respondents were pre-service (not employed): artisans 100% pre-service, craftsmen 74%, technicians 82%, but HND only 25%. Whild this survey did not endeavour to make an in-depth analysis and evaluation of guidance programmes in institutions, it suffices to mention here that it is in

line with the UNESCO revised recommendation concerning technical and vocational education of 1974 that, guidance for young people should be accompanied by information which gives them a realistic view of the opportunities available in given occupational cluster, including information regarding probable developments in the market and in employment structures, and what may be expected in terms of remuneration, career advancement and possibilities for occupational change. Such a requirement cannot be fulfilled by simply introducing career guidance programmes when students are in their final year of schooling, at whatever level.

3.10: RESPONDENTS' SOURCE OF INFORMATION REGARDING EXISTENCE OF THE COURSE

LEVEL	MEDIA %	SCHOOL %	COMMUNITY %	EMPLOYER %
ARTISAN	67.0	12.0	21.0	0.0
CRAFT	48.0	15.4	26.9	9.7
TECHNICIAN	29.0	52.0	14.0	5.0
H N D	27.0	47.0	23.0	3.0

School leavers have generally been accused of prefering white collar jobs to blue collar ones. The

researcher therefore attempted to test the respondent's commitment to their career. The assumption was that lack of commitment would imply lack of motivation to advance in one's career. Items 9(a) and (b) of the questionnaire were designed for this purpose. Eighty-two percent of the respondents indicated that they would not have opted for any other career even if they had a choice. This shows a marked commitment to their current technical career, although the survey did not attempt to further analyse why they prefer sticking to it. The 18% who said that they would have opted for a different career if they had a choice indicated their prefered fields as medicine, accounting and teaching.

The relative aspirational level of respondents for further education and training was established using item 10, 11 and 12 of the questionnaire. While over 95% of all categories of respondents aspired for further education and training at least beyond the level they were currently pursuing, further analysis shows that 76% of artisans, 84% of craftsmen and 97% of technicians aspired to reach at least higher diploma qualification, while 89% of HND aspired for degree qualifications. This shows that, the level of aspiration (highest qualification desired) is slightly lower among artisans and rises from technician level. Clearly, the survey shows relatively little

difference in aspiration for further education and training among artisans, craftsmen, technicians and HNDs.

The researcher was not only interested in determining the aspirational level of the respondents, but also in finding out how the respondents' aspiration (desired qualification) related to his actual expected achievement. Item 13 of the questionnaire was designed to yield this information. Responses were classified into two: either aspiration is lower than, or same as actual expected achievement. As may be seen from table 3.11, the expectation of achieving the aspired goal is highest among artisans who are low down the professional ladder, and lowest among HNDs who are high up the ladder. Thus HNDs view the processes of advancing to be very difficult while artisans seem to think there is no difficulty in advancing and hence achieving their goal. There is an explanation to this sharp contrast in opinion between HNDs and artisans. Most HND trainees have field experience, having spent some time in the service and so understand the system better. On the other hand, artisans and an over-whelming majority of craftsmen have no field experience as most of them are pre-service and so are expected to know little about the actual practices in the system. Their escalated expectations may therefore be understood in this context.

3.11: RELATIONSHIP BETWEEN ASPIRATION AND EXPECTATION

TRAINEE CATEGORY	LOWER THAN ASPIRED %	SAME AS ASPIRED %
ARTISAN	28	72
CRAFT	29	71
TECHNICIAN	36	64
H N D	46	54

Unlike the preceding items we have examined, which dealt more with individual characteristics of the respondents, the rest of the items in the questionnaire focused on investigation of factors in the education and training system, not directly under the respondents' control, but which militate against career advancement.

In item 14, the respondent was asked to indicate the factor which in his or her opinion would most likely prevent him or her from achieving the qualifications aspired for. The factors were coded as: social - family commitments or responsibilities; financial - lack of means to pay for studies; Motivational - there is no immediate benefit, e.g. increased salary or promotion

after completing the course; and Institutional - lack of enough places in training institutions. HNDs and technicians mainly cited institutional factors as major hindrances while craftsmen and artisans cited financial factors. The response of artisans and craftsmen may be understood since as has already been discussed, the majority of them are self-sponsored. Institutional factors cited by technicians and HNDs will be discussed in detail under item 17 below.

The opinion of respondents about the relative difficulty of career advancement in technical education and training as compared implicitly to other careers was sought (see Q 15 in appendix 1). For purposes of analysis, the responses were classified into positive or negative. Positive response means the respondent either strongly agreed or simply agreed with the assertion that chances of advancement are low while negative response means the respondent either strongly disagreed or simply disagreed with that assertion. As shown in table 3.12, the survey revealed very diverse opinions held by HND trainees on the one hand and artisan trainees on the other. While 71% of HNDs agree with the assertion that advancement through further education and training is difficult, 86% of the artisans disagree with the assertion. Of the 47%

of technicians who asserted that chances of advancement are low, 90% were in-service trainees. This finding further reinforces the conclusion drawn earlier from item 13 that trainees who have had no field experience have no clear understanding of how the system works to militate against attempts to advance if one joins the professional ladder at lower levels. This inability to understand the system maybe attributed to lack of comprehensive guidance and counselling programmes in both school and post-school institutions. Most counsellors emphasize employment prospects rather than career advancement.

3.12: SHOWS THE RESPONDENTS' ASSESSMENT OF CHANCES OF ADVANCEMENT

TRAINEE CATEGORY	POSITIVE* RESPONSE	NEGATIVE* RESPONSE
ARTISAN	14	86
CRAFT	29	71
TECHNICIAN	47	53
H N D	71	29

* Figures are expressed as a percentage of total enrolment at each category.

Item 16 of the questionnaire was designed to establish mainly the aim of artisan and craft trainees after completion of their course. Do they intend to venture into self-employment in the informal sector ("JUA KALI") or seek employment in the formal sector as wage earners? This would help establish how far government policy for establishing these courses, which is to usher the majority of craftsmen and artisans into self-employment as a means of solving unemployment problems (among others), is being achieved. The responses are summarized in table 3.13. 'Job' implies those respondents who stated their first priority as seeking for wage employment upon completion of the course; 'Business' refers to those whose first priority would be to be self-employed; and 'Other' implies the respondents either said the course would help him/her acquire more knowledge or promotion.

3.13: SHOWS CLASSIFICATION OF BENEFIT EXPECTED FROM THE COURSES BY RESPONDENTS

TRAINEE CATEGORY	JOB	BUSINESS	OTHER
	(%)	(%)	(%)
ARTISAN	51.0	36.0	13.0
CRAFT	61.0	22.0	17.0
TECHNICIAN	76.0	20.0	4.0
H N D	22.0	14.0	64.0

The survey shows that the percentage of those who intend to be self-employed is relatively low; 22% among craft and 36% among artisan trainees. Infact most artisan and craft trainees stated that they decided to undertake the course after they had been advised by the parents and relatives that the opportunities for employment in big companies was very high. It would appear therefore that more strategies ought to be designed in order to divert a greater percentage of trainees to self-employment, if the government is serious about its objective. Such strategies should not just be aimed at re-directing employment aspiration of trainees, but re-shaping the attitude of communities in which success of such training is only linked to or measured by employment in industry or government establishment.

It was noted for instance that most trainees indicated they would need to work for some time so as to raise enough capital to enable them purchase tools, before settling to self-employment. Means of financing those trainees who desire to set up their own businesses ought to be considered seriously with a view to encouraging that attitude among trainees and the community. There however, seems to be no problem of securing a job at HND level, for the 22% of HND respondents,

who are classified under 'Job', only talked of occupational mobility rather than seeking initial employment.

The respondents were further asked to state the factors which inhibit career advancement through further education and training. The factors cited may be broadly classified into five categories: financial, institutional, motivational, social and structural. The greatest financial constraint is linked to the difficulties encountered in raising tuition and boarding fees which increases in proporiton to the level of training. The current fee structure is shown in 3.14.

3.14: ANNUAL FEE CHARGED BY LEVEL OF TRAINING IN NATIONAL POLYTECHNICS AND T T Is

LEVEL OF TRAINING	TUITION SHS	BOARDING SHS	TOTAL SHS
ARTISAN	1800	2700	4500
CRAFT	1800	2700	4500
TECHNICIAN	2520	12150	14670
H N D	3600	12150	15750

For a student of an average family economic background, raising fees at artisan and craft level is difficult enough. At technician and HND level, such

a student would need a scholarship which in most cases is difficult to acquire. Companies have been reluctant to sponsor employees for further education and training, basing their argument on three facts: post-training productivity of the employee may not justify the costs involved in terms of time and money; poaching of trained personnel by other firms which may offer better salaries and fringe benefits; and discrepancies between what is taught at technical training institutions and what is actually required on the job. This has made companies to prefer training their own personnel on-the-job with emphasis on specific skills required in a particular industry. The training levy fund established by an Act of Parliament in 1970, has tried to redress this practice but its efforts as has been discussed elsewhere, has had little impact. Institutional constraints cited included: failure in examinations due to poor facilities such as books and tools; shortage of qualified lecturers and lack of commitment among the few available ones; and scarcity of training vacancies especially at higher levels of training.

Lack of motivation by employers featured prominently as one of the major factors hindering career advancement. The salaries are generally low and even promotion is not guaranteed upon completion of the course especially

at HND level. In the civil service for instance, there is apparently no clear scheme of service for HND graduates: a major bottleneck highlighted by most respondents. Further, the big gap between salaries and other benefits rewarded to staff holding management positions and the technicians who are directly involved in production processes, has been a source of mockery rather than motivation to the technicians.

Societal attitudes too have largely militated against the desire of many young people from pursuing a technical career. In particular, artisan and craft respondents said society considers them as academic failures who have been condemned by the system to 'un-honourable' careers of servicing motor-vehicles, laying bricks and planing timber. Hence the perception of society of the place and role of technical and vocational education in the socio-economic development of the country remains largely unchanged.

The structure of the technical education and training system with hitherto 'dead end' paths has not helped ambitious technicians to fulfill their educational aspirations. The long duration of courses, which often forces them to continue studies at a relatively advanced chronological age discourages some from

aspiring for any higher qualifications. This particularly affected HND holders. The Kenyan Universities have had their doors largely closed against HND graduates. Traditionally, the universities have preferred direct 'A' level entrants to BSC (engineering) programmes over HND graduates. To illustrate this point some comments from five HND respondents are quoted below:

- "Once you reach Higher Diploma, no means to the local university. Can not afford outside universities which have means to continue."

- "Few training institutions at higher levels (due to) the strictness with which our state universities adhere to the requirement of 'A' level passes even if one has advanced his/her knowledge through other means, e.g. Higher Diploma."

- "Those who pursue higher technical education have no easy access to local universities and have to go abroad after HND if ever they can secure that chance wherever they are employed."

- "Universities in Kenya do not accept students with diploma from technical colleges."

> "At higher diploma level, they are not considered as engineers. The process especially for me, after 'A' level in 1978 has taken 11 years - quite discouranging, compared to only three years at university, yet I won't be considered as an engineer, despite the experience".

Having outlined the major problems hindering career advancement, the respondents were finally asked to suggest solutions to those problems. Briefly, the suggestions given includes: reduction of fees; provision of more sponsorships; improvement of facilities in the institutions; shortening the duration of courses; and establishing a clear and fair degree of flexibility in the educational system, especially admission requirements in state universities so as to appropriately accomodate HND graduates in higher degree programmes.

Conclusion

In the light of the preceding discussion, in which responses to each of the items in the questionnaire has been examined in detail, the following overall conclusions of the survey are drawn:

There is no significant difference in aspiration between artisans, craftsmen, technicians and HNDs as

over 95% of all categories aspire for further education and training. Hence the apparent lack of career advancement among artisans and craftsmen cannot be reasonably attributed to lack of aspiration.

The longer one stays in the formal school system the higher the prospects for career advancement. This is because the trend of recruiting trainees into different levels of technical training tends to favour pre-service students who have formal academic qualifications instead of in-service trainees who have completed vocational courses at lower levels. Consequently, the chances that a student entering the professional ladder at artisan level would rise or advance to HND level are virtually zero while those of a student entering the ladder at technician level are very high, at 0.79.

The societal attitude towards technical and vocational education as an inferior type of education meant largely for academic failures has not appreciably changed over the years. Moreover, the current trend of recruiting artisan trainees predominantly from poorly qualified school leavers helps to reinforce the negative attitude already inherent within society. Political utterances to the effect that those who have failed at primary school examinations and cannot proceed to form

l should join artisan courses negatively reinforces the popularity of technical education and has negative implications to career advancement of such trainees.

The major problems besetting career advancement in technical education and training are financial, institutional, structural and to a lesser extent motivational.

This survey has provided us with background information upon which we shall now make a comparative analysis of school-based and post-school technical education and training programmes in Kenya, Korea and Nigeria in the next two chapters of this study.

CHAPTER FOUR

PRE-VOCATIONAL EDUCATION AND TRAINING IN PRIMARY AND SECONDARY SCHOOLS : KENYA, THE REPUBLIC OF KOREA AND NIGERIA

CHAPTER 4

Introduction

The focus of this chapter is on the concept of pre-vocational education and training at primary and secondary school levels in the referenced countries. We shall also analyse the structure, curriculum, examination and certification associated with the implementation of this concept.

Recent innovations in primary and secondary education in most countries make any attempt to strictly differentiate pre-vocational education and general education difficult. This is because of the growing tendency to vocationalizing general education: a situation that allows the infusion of vocational subjects into an otherwise purely academic curriculum. Thus pre-vocational education is now largely seen as part of basic or general education that should be offered to every pupil at certain levels of education rather than a distinct course which is reserved for a particular category of pupils.

However, for purposes of clarity, we shall distinguish between general education, pre-vocational education, and vocational training at the level of their aims. Unlike general education which seeks to impart

literacy, numeracy, cognitive and behavioural skills, pre-vocational education is generally aimed at introducing students to the knowledge, skills and attitudes relevant to various occupations. Vocational training, however, entails programmes which are directed at the acquisition of specific occupational skills to be applied in solving particular tasks in that vocation. In light of these close linkages, it is inevitable that while discussing pre-vocational education, some reference will also be made to general education at primary and secondary school levels.

Concept

The concept of pre-vocational education varies from one country to another, and tends to be influenced by three important factors: the economic status; level of industrialization; and culture of a particular country. Further, a nation's objectives of pre-vocational education and the policies governing its provision are a reflection of this concept. This is also true for Kenya, the Republic of Korea and Nigeria.

In Kenya, the main objectives of pre-vocational education, offered at both primary and secondary schools, are threefold: to develop the students' occupational

aspiration; foster positive attitudes to manual work in students; and lay the foundation for further training or employment.

While these objectives reveal an attempt to use Pre-vocational education as a means of re-orienting occupational aspiration of the Kenyan youth to actual labour market requirements of the economy, and raising their level of trainability, the ultimate belief is that pre-vocational education is a panacea to unemployment problems among the youth. Thus pre-vocational courses in Kenya are both introductory and preparatory. They are introductory to the minority of pupils who proceed to higher levels of formal education or training, but preparatory to the majority for whom either primary or secondary education is terminal and so must join the labour market either as salaried or self-employed people.

Like Kenya, the Nigerian system of education incorporates pre-vocational subjects at both primary and secondary school levels. However, there is some difference in the concept of pre-vocational education, as reflected in its aim and level of emphasis. For Nigeria, the aims of pre-vocational education are: "to increase knowledge of the World of Work; nurture the right attitudes for growing into adult life; and provide opportunities to develop

manipulative skills".[1]

Evidently, pre-vocational education in Nigeria mainly provides opportunities for students to be exposed to various occupations available while at the same time shaping their attitudes and developing manipulative skills, rather than preparing them for employment. This is particularly true at primary school level. Thus while Kenya's concept of pre-vocational education is largely preparatory, as has been seen and shall further be seen when analysing the curriculum, that of Nigeria is exploratory. This difference in concept of pre-vocational education by Nigeria may be explained at the level of legislation and policy.

Firstly, the laws of Nigeria do not allow children below fourteen years of age to work. Moreover, since the average age for admission to standard one is six and the duration of primary education is six years, a pupil is expected to complete primary education at the age of twelve. Hence it would appear a contradiction for the same government to 'prepare' primary school pupils for employment. Secondly, the Nigerian ultimate goal is to have 100% transition rate from primary to junior secondary school. Thus it is extending its policy from Universal Primary

Education (UPE) to Universal Junior Secondary Education (UJSE). This has already been achieved in some states.[2] It is in view of this that the Nigerian concept of pre-vocational education changes from being exploratory at primary school level to preparatory at junior secondary school and beyond.

The Republic of Korea conceives pre-vocational education, especially at elementary and middle school levels, as being mainly exploratory. However, unlike both Kenya and Nigeria, Korea places relatively little emphasis on pre-vocational education at elementary school level. Infact the aims of elementary education in Korea give no specific reference to pre-vocational education. At middle school level (equivalent to junior secondary), however, the government states one of the objectives of education as:

> to nurture understanding and knowledge regarding occupational possibilities; to foster a spirit of diligence and industry; and to enhance the ability to select a future career.[3]

Similarly, at the academic high school level, one of the objectives of education which is closely linked to pre-vocational education is:

> to upgrade physical standards, and to enable students to properly choose their future career and direction in life.

It may be construed from these aims that pre-vocational education in the Republic of Korea plays one significant role: that of exposing students to, and enhancing their awareness and understanding of the various occupations or professions available. This however, should not be confused with career education which in essence plays only a supplementary role to vocational education by informing students of the various careers or occupations open to them, and the kind of job skills needed in the labour market, without attempting to impart to them the basic theoretical knowledge and practical skills relevant to those occupations. The Korean education system therefore, cognisant of its rapid pace of industrialization, emphasizes the provision of basic or general education rather than pre-vocational education at elementary and middle school level as a foundation for further training. The same policy is pursued at the academic high school level. The only exception are the vocational high schools which offer specialized vocational courses geared towards direct employment. The type of education offered in these vocational high schools, as we shall see later, cannot and has not been classified as pre-vocational education.

From the overall analysis of pre-vocational education given above, two observations may be made.

Firstly, although the three countries (Kenya, the Republic of Korea and Nigeria), are historically linked to Britain and USA either as former colonies or trade partners, their concept of pre-vocational education differs in context from that of Britain and USA. The main motivation behind the provision of pre-vocational education in USA, based on the comprehensive school model, was an attempt to democratize education and hence break racial discrimination. Likewise, in Britain it entailed:

> educating children of different backgrounds and of different abilities together, ... to break down class barriers and mutual ignorance of different social groups and create the context for a more democratic, open and unprejudiced society.[5]

However, for Kenya, the Republic of Korea and Nigeria, the motivation is mainly two fold: to close or minimize the gap between education and the world of work; and to curb unemployment among the youth by imparting to them relevant knowledge, attitudes and skills.

Secondly, the analysis shows one significant point of commonality and another significant point of diversity in the concept of pre-vocational education in Kenya, the Republic of Korea and Nigeria. In all the three countries, pre-vocational education is

designed to provide an opportunity to pupils to explore various occupational fields as well as lay a foundation for further specialized training. However, unlike Korea and Nigeria which do not conceive pre-vocational education, especially at elementary or primary school level as being preparatory for employment, Kenya's clear concept is that pre-vocational education should not only expose students to various professions and lay a foundation for further training, but prepare the majority of pupils who may never proceed to higher levels of formal education or training for either wage or self-employment. This Kenyan concept, however, is likely to change as the level of industrial and hence economic development of the country rises.

As may be expected, these concepts of pre-vocational education have uniquely influenced the structure, curriculum, examination and certification as well as financing of education in each country. We shall now analyse these variables in detail.

Structure, Examinations and Certification

The degree to which any educational structure inhibits or promotes career mobility is dependent on two factors: structural rigidity or flexibility.

A rigid structure ties students to one particular route as the only avenue for advancement. Where any other route in such a structure is provided, it is characterized by stringent formalities which assume uniformity of ability, interest and aptitude in students or purpose of the programme. A flexible structure however, allows for alternative routes as avenues for mobility. In this section, we shall analyse the structures of primary and secondary education in Kenya, Nigeria and the Republic of Korea, with specific emphasis on pre-vocational education. As a prelude to an in-depth comparison, we shall give a brief analytical presentation of the system in each country.

Kenya is currently in a state of transition from the 7-4-2-3 to the 8-4-4 system of education. The former system entailed 7 years of primary education, 4 years of 'O' level secondary education, 2 years of 'A' level secondary education, and 3 years basic university education. However, its curriculum, modes of assessment, and hence products (school leavers) were widely criticized. The system operated a curriculum that had a relatively heavy academic component with the result that it produced school leavers who had little practical or relevant employable skills in the labour market. Moreover, the system was highly

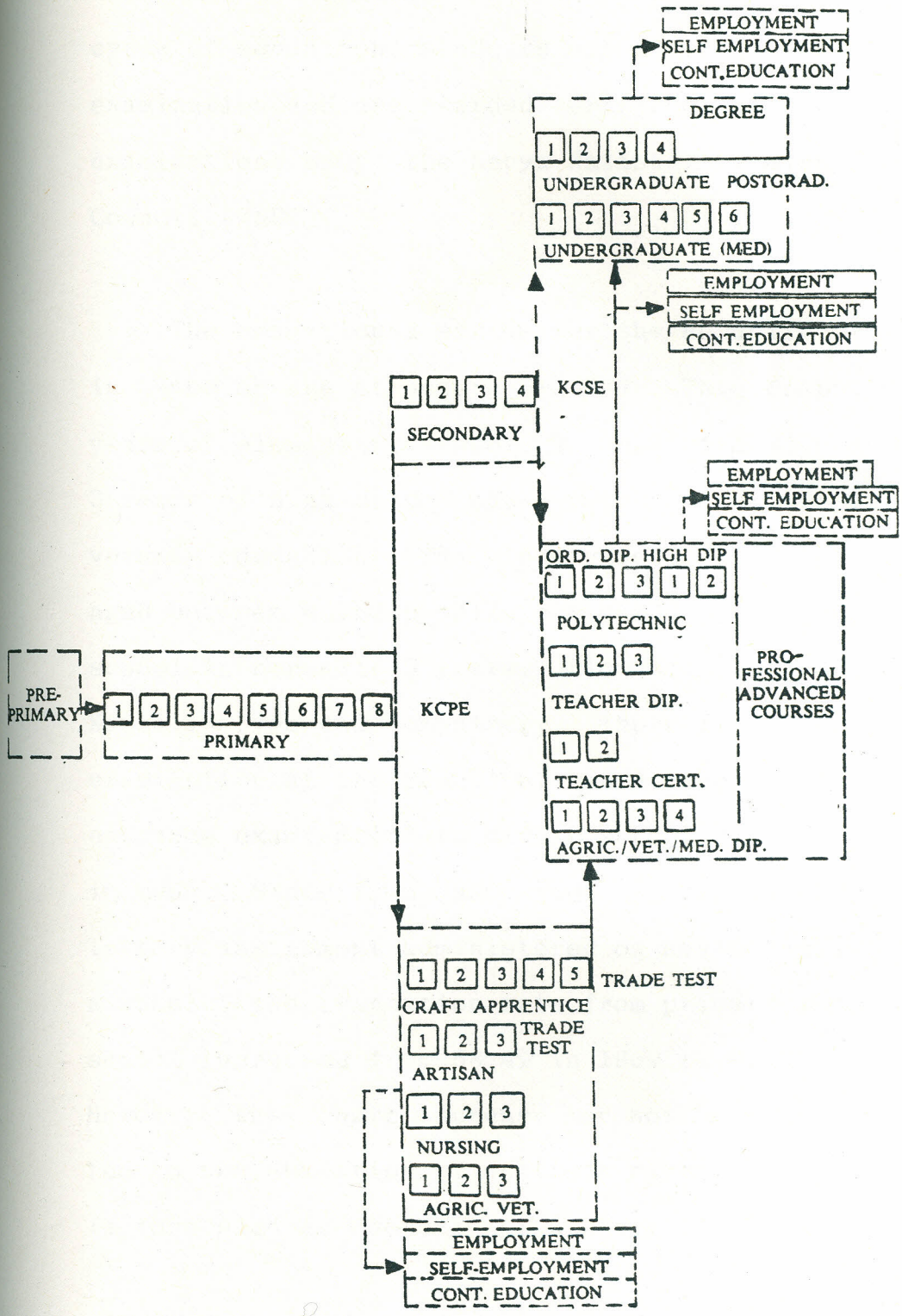
examination oriented as it was seen to mainly perform the function of selecting students from one level of education to another. The tendency of measuring the students' achievement by one final examination at each level of education promoted the spirit of competition rather than co-operation among students.

It was in the light of these shortcomings that the government decided to review the educational structure and curricula with a view to redressing them. Following the recommendations made in 1981 by the Presidential Working Party on the Establishment of a Second University (mainly referred to as the Mackay Report), the government decided to re-structure the system of education to the present 8-4-4 structure. This structure entails 8 years of primary education, 4 years of secondary education and 4 years of minimum university education. Its implementation started in 1985 when the then standard seven pupils proceeded to standard eight instead of joining form one. The success of its implementation, and the degree to which it has solved or hopes to solve the shortcomings inherent in the previous structure is subject fo further debate. We shall, however, attempt to make some evaluation of it at a later stage in this study.

The structure of the 8-4-4 system is shown in figure 4:1. Pre-primary education is given to children of age 3-5. The normal age for standard one enrolment is 6. During the eighth year in primary school, pupils sit for a national examination: the Kenya Certificate of Primary Education (KCPE). At this stage, pupils are expected to make a decision to follow one of the two main routes available. The first route entails four years of secondary education followed by a further four years of university education. However, students who follow this route must sit for a national examination at the end of form four: the Kenya Certificate of Secondary Education (KCSE). This examination plays a selective function of channeling a few students to universities for further education and others for training in various trades and professions. The second route entails training in artisan and craft trades as well as other vocations such as Agriculture, Nursing and Commerce. Those who successfully complete craft courses may, after working for sometime, join higher courses at technician or diploma level and later at technologist or degree level as the case may be.

In Kenya therefore, tracking occurs at the end of every cycle of education: the eighth year in primary school and the fourth year in secondary schools, students opt for further formal education, vocational training or employment. Further, at the end of every

4.1: EDUCATION SYSTEM IN KENYA



SOURCE: COUNTRY REPORT (KENYA) PRESENTED TO THE 41ST SESSION OF THE INTERNATIONAL CONFERENCE OF EDUCATION, GENEVA, 9TH-17TH JANUARY, 1989, BY THE MINISTRY OF EDUCATION AND THE MINISTRY OF TECHNICAL TRAINING AND APPLIED TECHNOLOGY, P.12.

cycle of education, students sit a centralized national examination and are awarded certificates by a national examinations body: the Kenya National Examinations Council (KNEC).

The educational system for the Republic of Korea is based on the structure 6-3-3-4. This comprises 6 years of elementary school, 3 years of middle school, 3 years of high school and 4 years of college or university education. The kindergatens cater for children aged between 4 and 5 while entry age to elementary school is normally 6 years. Elementary education in Korea is free and compulsory. There is no formal examination at the end of elementary education. The entrance examination to middle school was abolished in 1969. Since then, admission is made through lottery assignment administered on zonal basis. As a result, the transition rate from primary to middle school increased from 58.4% in 1969 to 99.2% in 1985.[6] However, this sharp increase may not be solely attributed to the abolition of entrance examination, as other factors such as economic growth are attributable.

At the end of middle school, students sit for a qualifying state examination. Those who pass are admitted to High School through lottery assignment on zonal basis. Prior to the introduction of a centralized state qualifying examination at the end of middle

school in 1974, individual high schools organized their own entrance examinations. Abolition of this practice by the government had a dual effect: that of raising the transition rate from middle school to high school; and that of equalizing the status of high schools which had hitherto been classified into 'inferior' and 'superior' categories.

The Korean structure allows for two types of high schools: academic high schools and vocational high schools. While admission to academic high schools is only based on the state qualifying examination, that to vocational high schools is subject to passing additional examinations:

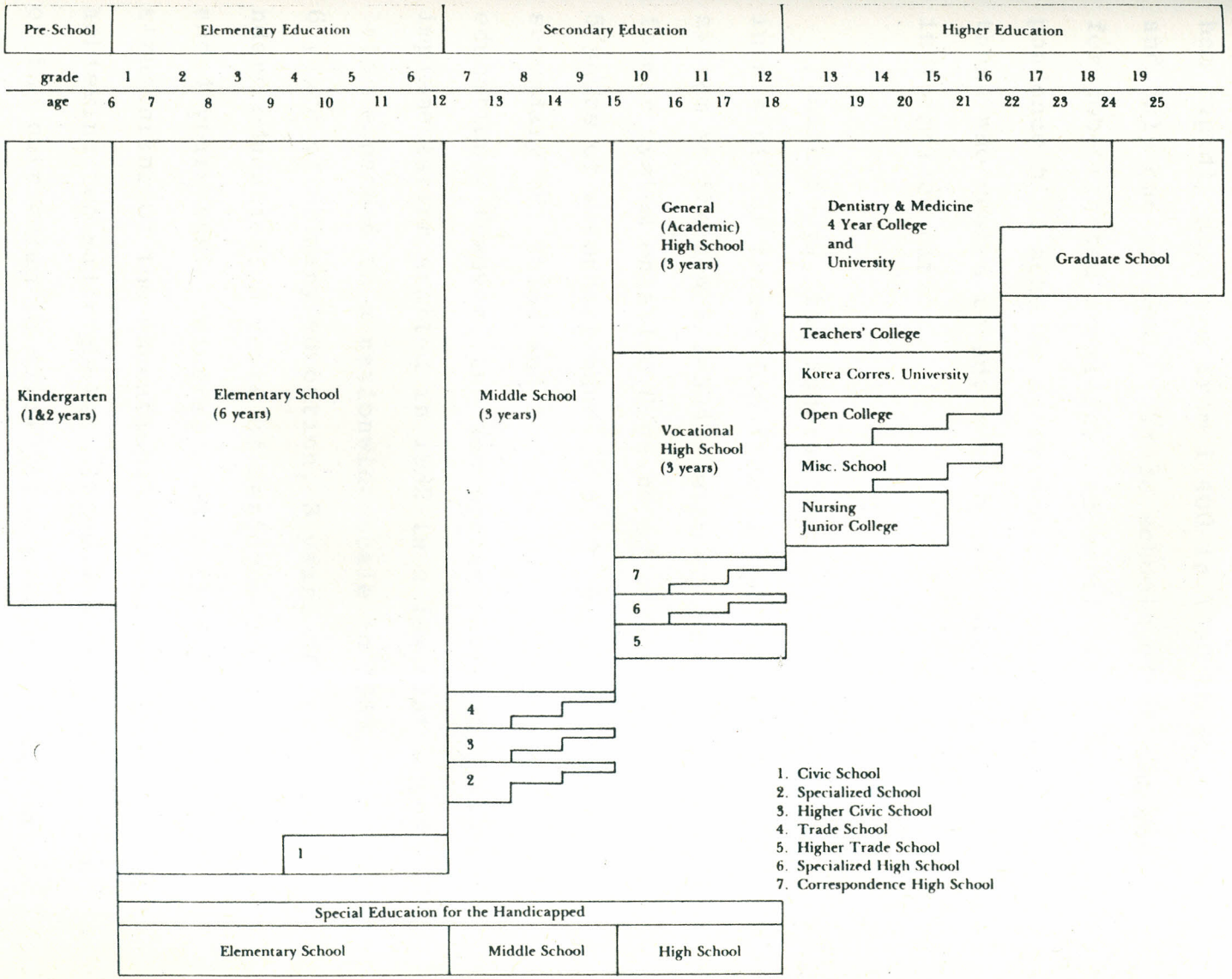
> applicants for vocational high schools must be middle school graduates and are required to take a preliminary examination which is administered at the provincial level. Those who pass this examination are tested again by the individual schools and those failing this main test are given a chance to enter academic high schools through the lottery system without taking another examination. This is reflective of an attempt to channel more able students into vocational high schools.[7]

At the end of middle school, therefore, tracking occurs. Each track, however, has provision for advancement to higher levels of education and training.

Prior to 1981, two examinations were done by high school students before admission to colleges or universities. The first one was a preliminary qualifying test based strictly on the school curriculum. Those who passed it applied for and sat a second examination set by individual colleges and universities. In 1981, the college entrance examination system was revised. Effectively, "the main entrance examination was abolished and a new system of combining scholastic achievements in school and the score obtained in a nation wide qualifying examination to determine the applicants' eligibility for admission was introduced."[8] The scholastic achievement in high school now accounts for 30% and the national qualifying examination 70% of the total marks. It is anticipated that the proportion of the scholastic achievement marks will continue rising while that of the state qualifying examination will decrease with time.

Figure 4.2 shows the overall structure of the Korean educational system. The civic school, specialized school, higher civic school, trade school, higher trade school, specialized high school, and correspondence high school denoted by numerals 1,2,3,4,5,6, and 7 respectively in 4.2 fall under non-formal education. These act as remedial and skill improvement centres. Civic schools are meant for those who drop-out of elementary school for one reason or another.

4.2: STRUCTURE OF THE EDUCATIONAL SYSTEM IN KOREA



SOURCE: A HANDBOOK OF KOREA. SEOUL INTERANTIONAL PUBLISHING HOUSE, SEOUL, 1987, P.448.

However, with the introduction of UPE, their number has rapidly declined from 1,400 in 1950 to 69 in 1970 and only one in 1985.[9] Trade schools offer courses for job-oriented knowledge and skills while correspondence high schools offer preparatory courses for those who desire to advance to, or resume regular courses in formal education.

Like Kenya, the Federal Republic of Nigeria is in a state of transition from the previous 6-5-2-3 system to the new 6-3-3-4 system of education. The former system entailed 6 years of primary education, 5 years of secondary education, 2 years of higher secondary education and 3 years of basic university education. However, the new system whose initial implementation started in 1982 in a few states and later expanded to a nationwide scale in 1985, entails 6 years of primary education, 3 years of junior secondary education, 3 years of senior secondary education and 4 years basic university education. The restructuring of the educational system was aimed at achieving two major goals: increased diversification of the curriculum to allow for a greater vocational and technical component in general education; and greater structural flexibility to facilitate vertical and horizontal mobility between various levels and institutions.

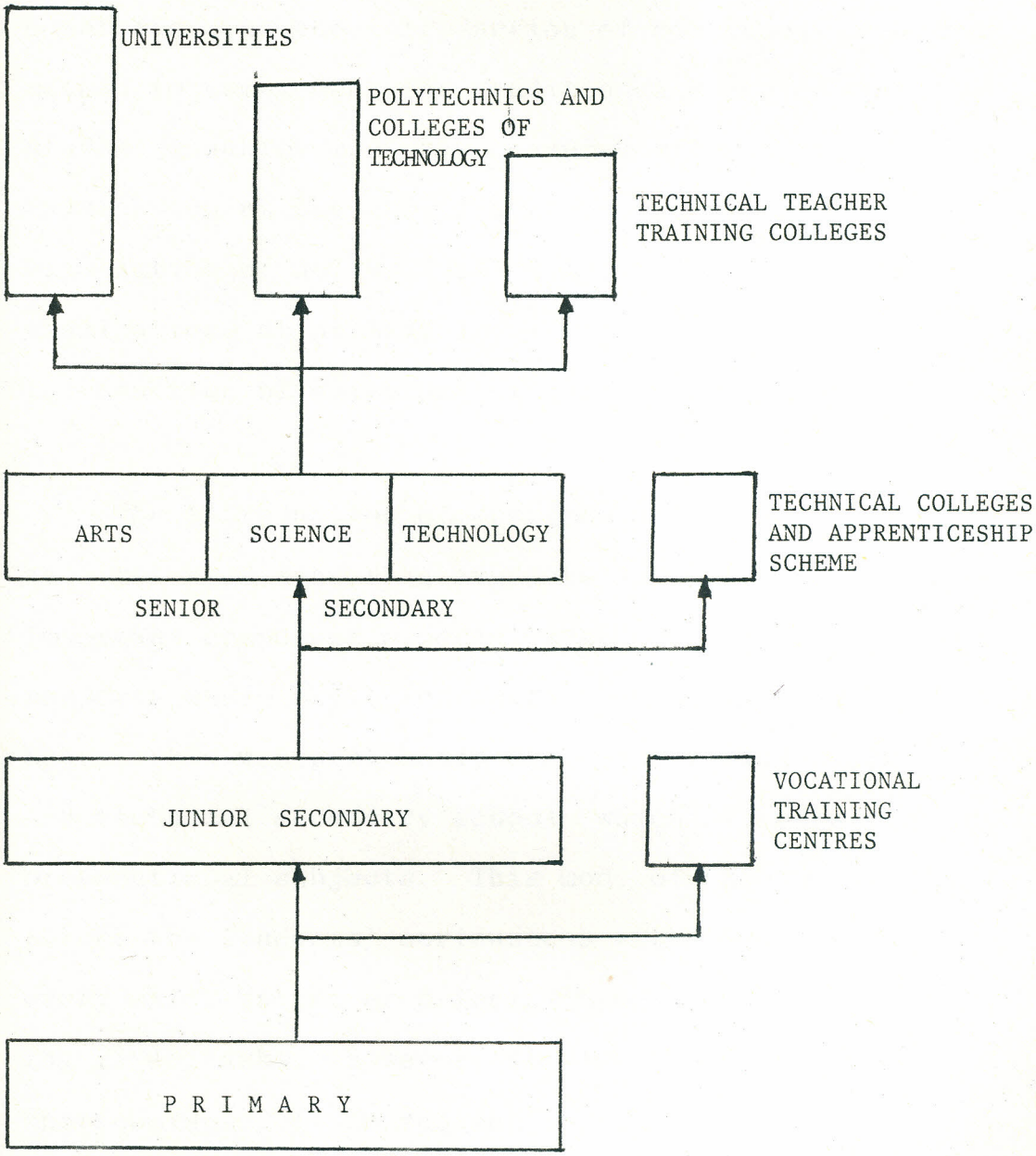
Pre-Primary education is given to children aged between 3 and 5, prior to their entering primary school. The normal age for entry into primary school is 6 years. There is no formal examination done at the end of this level of education. Instead, continuous assessment method is used to evaluate students' achievement, and on the same basis, a school-leaving certificate is issued. Primary school leavers may then join junior secondary school but "those unable to proceed to junior secondary schools will have opportunities provided for vocational training in craft schools and similar institutions where they can learn specific trades".[10] At the junior secondary school level, students' achievement is evaluated by a state examination and the continuous assessment method, on the basis of which a Junior Secondary School Leaving Certificate is issued by the headmaster.

The three years of senior secondary school mark a major point of articulation, as major tracking occurs here. The three main tracks of specialization are: Arts, Science and Technology. Thus senior secondary schools in Nigeria are mainly comprehensive. At the end of this level, students sit a national examination administered by the West African Examination Council (WAEC). On the basis of this examination, and with

due consideration of the continuous assesment of students' progress, a final secondary school leaving certificate is issued. Senior secondary school leavers may then proceed to universities or other post- secondary colleges which offer courses of varying duration. However, no data was available to analyse the percentage of senior secondary school pupils who proceed to university or other technical courses. Three types of post-secondary technical education institutions exist: technical colleges, polytechnics, and colleges of technical teacher education. Normal admission to university under the new structure will be based on the results of a matriculation examination jointly conducted by the universities concerned. Figure 4.3 shows the schematic representation of the 6-3-3-4 system of education in Nigeria.

It is evident that the structure of each country's educational system has been designed to respond to various political, technological and socio-economic challenges. A careful analysis of the way Kenya, Korea and Nigeria have responded to such challenges, through restructuring their educational systems and hence methods of assessment, reveals points of commonality as well as diversity.

4.3: STRUCTURE OF THE EDUCATIONAL SYSTEM IN NIGERIA



The salient features of recent innovations in structure and assessment methods common to the three countries are: the introduction of continuous assesment method to complement the traditional practice where a student's achievement was measured only by one formal examination at the end of a given cycle of education; elimination or delay of selection based on entrance examinations at primary levels of education; and introduction of universal primary education.

The introduction of continuous assessment method as a means of measuring students' achievement is an important component especially to pre-vocational subjects where skill acquisition is emphasized. In Kenya, this was previously done only in industrial and technical secondary schools which had been teaching prevocational subjects. This mode of assessment reinforces the students' seriousness with which they take every skill taught or principles outlined in performing given tasks. However, it also has acknowledged shortcomings. It is subject to abuse arising from partiality among teachers towards their students, and lack of professionalism among pre-vocational teachers especially in Kenya and Nigeria, who are either not trained or inadequately trained in pedagogy and hence in educational evaluation techniques. The consequence

is clear: lack of uniformity in judging standards reached. The Moderators, who are usually professionals, go round schools to review and moderate the continuous assesment marks awarded by individual subject teachers. However, this has relatively little impact on the shortcomings noted above since they are usually few in number and only take a small sample of the population under scrutiny. Little may be said here about the specific modalities followed in administering continuous assesment method in the republic of Korea since no detailed information was available to the researcher.

Each structure for the three countries allows for alternative routes to further education and training, thus allowing for some degree of flexibility. But this is more pronounced at post secondary rather than post-primary level. Evidence from Korea, suggests that as the country's level of industrialization rises, the degree of tracking at lower levels of education, which may be attributed to high drop-out rates from the main formal educational route, declines. This is reflective of the fact that higher per capita income in any country implies people are able to provide facilities and other necessary educational inputs to raise the general level of education of their offsprings.

As observed earlier, the three countries have made attempts to either eliminate or delay selection of pupils to the second level of education, based on entrance examinations. In Kenya, a change to the present 8-4-4 system meant pupils could now have one more year of 'free' education before being subjected to the first examination which mainly performs a selective function. Further, as we shall see at a later stage, this extra year allows the infusion of more pre-vocational subjects into the curriculum. However, Nigeria and Korea abolished formal selection examination at the end of 6 years of primary or elementary education. This was aimed at raising the transition rate from primary to junior secondary school in Nigeria and from elementary to middle school in Korea. Both countries, as shown earlier, are consistently pursuing the policy of free and universal junior secondary education, but this is partly due to the fact that they are both relatively more wealthy than Kenya. Further, Korea has the advantage of having a relatively low and stabilized rate of population growth, which enables it to plan and provide educational facilities with less constraints.

The chief purpose of these common innovations has been to provide a rational structure that will

best allow the majority of the nations' population to have complete basic education as a human right, while at the same time encouraging vertical mobility between levels of education. To this end, all the three countries are basically moving in the same direction.

However, there are three clear structural differences among them. The first one is the duration allowed for basic education. In Kenya, the structure allows all pupils enrolled in primary school to have eight complete years of education before the first selection examination is done. However, though the 6-3-3-4 structure of Korea and Nigeria shows that six years constitute basic education, further analysis reveals some disparity between the two countries.

In Korea, the transition rate from elementary to middle school is over 99%. This as noted earlier, is because the system, backed up by adequate physical and other educational facilities, allows for automatic transition between the two levels without any entrance examination. However, due to lack of facilities and other reasons not discussed here, the transition rate from primary to junior secondary in Nigeria was on average only 46.69% in 1984.[11] Effectively, therefore, basic education in Korea, Kenya and Nigeria may be rated at nine, eight and six years respectively.

Clearly, Korea is ahead of the other two countries due to its relatively high economic status as well as longer history of post-independence educational development. Basic education in this context refers to the minimum education offered to the majority of pupils before any major selection is done.

Despite the low transition rate from primary to junior secondary in Nigeria, it must be emphasized that the country is aiming at 100% transition rate at this level. Further, Nigeria being a federation of 19 states with imbalances in level of economic development and disparities in the degree of ability, consistency and enthusiasm with which the 6-3-3-4 system of education has been implemented, requires that the figure quoted as the transition rate (46.69%), be seen as a national average for some states have already achieved 100% transition rate from primary to junior secondary.

The second structural difference is the degree to which the systems allow for entry, exit and re-entry by those people who for various reasons may not consistently pursue formal schooling to the end of a particular cycle. As already discussed, Korea, through its civic, higher civic and correspondence high schools has such a provision. Thus in this country,

someone who drops-out at a certain level has hopes of formally pursuing further education at a later convenient date. Nigeria has recently introduced evening classes within formal institutions, to cater for drop-outs and others who may wish to further their education.

The third major observed difference among the three countries is the extent to which the system of education, through its structure and modes of assesment promotes career mobility within the technical occupations.

In Kenya and Nigeria, the systems operate in a way that only pupils who are unable to secure chances for further education within the formal academic route are channelled to vocational courses. This expressed inability is often characterized by 'failure' in selection examinations. In Kenya, those who obtain low grades, and hence cannot be admitted to form one join either Youth Polytechnics or Technical Training Institutes which offer artisan and craft courses, while in Nigeria, they join vocational or pre-vocational schools, but those completing junior secondary may join apprenticeship programmes. Such practices of popularizing, either directly or indirectly, vocational courses as being only suitable for less-able students has a negative impact to career advancement

in the technical field in the long run.

The Republic of Korea, however, shows a marked departure from such practice. As we have already seen, examinations and other modes of assesment are used in such a way that only the more capable students are channelled to vocational and technical courses. Apart from ensuring that such students, despite the level at which they branch off from the formal academic route, will have no inability in terms of intellectual capability to advance in their career, it also helps to reform the mistaken view held by society that bright students are a 'preserve' for careers which demand academic excellence while technical careers are preserved for 'academic failures'.

Having analysed the structure within which pre-vocational education is offered at primary and secondary school, and the modes of assessment within that structure, we shall now examine comparatively, the curricula of pre-vocational education.

Curriculum

The curriculum offered at primary and secondary school levels in each of the three countries is reflective of the concept of pre-vocational education held

within each country. The content and relative importance attached to pre-vocational education are dependent on the role it is expected to play: whether preparatory, exploratory or both.

Tables 4.4 and 4.5 show the primary school and elementary school curriculum in Kenya and the Republic of Korea respectively. They give a picture of the overall curriculum offered at these levels: number and type of subjects, time allocation and grades at which they are offered. In Nigeria, pre-vocational subjects taught at primary school include: local crafts such as Weaving and Dying; Domestic Science and Agriculture. Details of time allocated to each could not be obtained by the researcher for further scrutiny.

A comparison of the Kenyan and Korean primary school curricula reveals several distinct features. Both countries offer Art, Crafts and Music as the only pre-vocational subjects at lower primary or elementary school level, although music may not be fully classified as a prevocational subject. In Kenya time allocated for these subjects is 25.5% while that of Korea is 14.8%. However, at upper primary or middle school level, the percentage time allocated to pre-vocational subjects in Kenya rises steadily to 38% while that of Korea decreases slightly to 12.5%. Further the

4.4: PRIMARY SCHOOL CURRICULUM IN KENYA

Subjects	Lower Primary Periods per Week	Upper Primary Periods per Week	Examination
1. English	5	7	1 paper
2. Kiswahili	5	4	1 paper
3. Mathematics	5	6	1 paper
4. Science	3	3	)1 paper for)science and)
5. Agriculture	-	3	)agriculture)
6. Art	-	3	))
7. Craft	-	4	)1 paper for
	-	4	) art, craft)
8. Home Science	-	4	)home science)
9. Music	2	2	)and music))music)
10. Geography) History) & Civics)	2	4	)1 paper for)history,)civics and
11. Religious Ed.	4	3	)religious)education
12. Pastoral Programme	1	1	-
13. Physical Education	5	3	-
14. Business Education	-	3	)examined in)one of the)papers above
15. Art & Craft	3	-	
16. Mother Tongue	5	-	

Notes: Each lesson in the Lower Primary is of 30 minutes duration
Each lesson in the Upper primary is of 35 minutes duration

SOURCE: Extract from Report of the Presidential Working Party on Education and Manpower Training for the Next Decade and Beyond (1988). [Kamunge Report], Kenya Government, p.156.

4.5: PRIMARY SCHOOL CURRICULUM IN THE REPUBLIC OF KOREA

Classification	1st year	2nd year	3rd year	4th year	5th year	6th year
Moral education	374(11)	374(11)	68 (2)	68 (2)	68 (2)	68 (2)
Korean language			238 (6)	204 (6)	204 (6)	204 (6)
Social studies			102 (3)	102 (3)	135 (4)	136 (4)
Arithmetic	204 (6)	135 (4)	136 (4)	136 (4)	170 (5)	170 (5)
Science		68 (2)	102 (3)	136 (4)	136 (4)	136 (4)
Physical education	204 (6)	236 (7)	68 (2)	102 (3)	102 (3)	102 (3)
Music			68 (2)	68 (2)	68 (2)	68 (2)
Fine arts			-	68 (2)	68 (2)	68 (2)
Crafts	-	-	68 (2)	68 (2)	68 (2)	
Total	782(23	816(24)	884(26	952(28)	1020(30	1020(30)
Extracurricular activities	-	-	34+ 1+)	68+(1+)	68+(2+)	68+(2+)
Grand total	782(23)	816(24	918+(39+)	1024+(30+)	1088+(32+)	1088+(32+)

Note: The hours shown on this table represent minimum school hour allotment for thirty-four weeks per year. Figures in the parentheses are hours taught per week.

SOURCE: Report presented by the Ministry of Education (Korea) to the 41st Session of the International Conference on Education (ICE), Geneva, 9-17 January, 1989, p.14.

baskets, table mats and combs. Skills obtained in Home Science include needlework, food preparation, as well as child and home care. This leads to production of articles like table mats, clothes and curtains. In Agriculture, pupils are taught skills ranging from the growing of crops such as vegetables and flowers, pottery and Bee-keeping to the rearing of domestic animals and repair of farm implements. The skills taught in each subject are further related as much as possible to the requirements of the immediate community within which the school is based.

Korea and Nigeria, because of their different concepts of pre-vocational education, provide less practical experiences to their pupils than does Kenya. However, the actual practical lessons learned and skills obtained especially in Art and Crafts in any country depends on its material culture and hence occupational orientations.

Tables 4.6, 4.7 and 4.8 show the secondary school curriculum in Kenya, middle school curriculum in Korea and high school curriculum in Korea respectively.

4.6: SECONDARY EDUCATION CURRICULUM IN KENYA

DISCIPLINES	SUBJECT OFFERINGS	OPTIONS & CHOICES	KCSE EXAMINATIONS CHOICES & OPTIONS FORM 3&4 (Total in or sub.
			Group 1 Compulsory
Communication	(a) English (b) Kiswahili (c) Foreign Languages	(a) Compulsory 1. English 2. Kiswahili 3. Mathematics 4. Biological Sciences	1. English 2. Kiswahili 3. Mathematics 4. Biological Sciences or (4) Biology 5. Physical Sciences or (5) Physics (6) Chemistry
Mathematics	(d) Maths.	5. Physical Sciences 6. Geography	6. (7) Geography
Science	(e) Physical Sciences (f) Biological Sciences	7. History & Government 8. Religious Education	7. (8) History & Government
Humanities	(g) Geography (h) History & Government (i) Religious Education (j) Social Ed. & Ethics	9. Agriculture (b) 10. Applied Sub. i.e One of the following	8. (9) Group 2 One of the following (i) Christian Religious Education (ii) Islamic Religious Education (iv) Social Ed. & Ethics
Applied Ed.	(k) Agriculture (l) Industrial Ed. 1. Woodwork 2. Metalwork 3. Power Mechanics 4. Electricity (m) Business Education 1. Accounts 2. Commerce 3. Typing & Office Prac. (n) Home Science 1. Clothing & Textile 2. Food and Nutrition	1. Woodwork 2. Metalwork 3. Power Mechanics 4. Electricity 5. Building Const. 6. Drawing & Design 7. Home Science (c) 11. One of the following Music Art & Craft Business Ed.	9. (10) Group 3 One of the following Home Science Agriculture Woorkwok Metalwork Building Construction Power Mechanics Electricity Drawing & Design
Physical Ed.	(o) Art & Design (p) Music	12. Social Ed & Ethics 13. Physical Education	10. (11) Group 4 One of the following French German Art & Craft Music Accounting Commerce Economcis Typewriting with Office Practice

SOURCE: (Kamunge Report, Op. Cit., p.158.

4.7: MIDDLE SCHOOL CURRICULUM IN THE REPUBLIC OF KOREA

	CLASSIFICATION	1st Year	2nd Year	3rd Year
Required Subjects	Moral Education	68(2)	68(2)	68(2)
	Korean language	136(4)	170(5)	170(5)
	Korean history		68(2)	68(2)
	Social studies	102(3)	68-102(2-3)	68-102(2-3)
	Mathematics	136(4)	102-136(3-4)	102-126(3-4)
	Science	136(4)	102-136(3-4)	102-136(3-4)
	Physical education	102(3)	102(3)	102(3)
	Music	68(2)	68(2)	34(1)
	Fine arts	68(2)	68(2)	34(2)
	Classical Chinese	34(1)	34-68(1-2)	34-68(1-2)
	Foreign language (English)	136(4)	102-170(3-5)	102-170(3-5)
	Vocational skills (boys)	102(3)	136-204(4-6)	-
	Home economcis (girls)			
	Elective Subjects: Agriculture, Engineering, Commerce, Fisheries, House Keeping			Se.1-2 170-238(5-7)
	Elective	0-24(0-1)	0-34(0-)	0-34(0-1)
	Extracurricula activities	68+(2+1)	68+(2+)	68+(2+)
	Grand total	1,56-1,190+ (34-35)+	1,156-1,244+ (34-36)+	1,156-1,244+ (34-36)+

Note: The hours shown on this table represent minimum school hours alloted for thirty-four weeks per year.

Figures in the parentheses are hours taught per week. El. is elective.

SOURCE:

Ministry of Education (Korea).

Report to the ICE, Geneva, 9-17 January, 1989, p.16.

4.8: HIGH SCHOOL CURRICULUM IN THE REPUBLIC OF KOREA

Subjects	Required Subjects Units for 10th Grade	Students select one of 3 majors		
		Humanities Major 11th-12th Grades	Science Major 11th-12th Grades	Vocational Major 11th-12th Grades
Moral Education	6	-	-	-
Korean Language (I,II)	14-16	14-18	8-10	3-8
Korean History	6	-	-	-
Social Studies Geography I,II)	4-6	4	-	2-6 Se.1
World History	2	2	-	
Mathematics	8-14	6-8	10-18	4-18
Biology (I,II) Earth Science (I,II)	Each	-	Each 4	4-12
Chemistry (I,II) Physics (I,II)	4-6			Se.1-2
Physical Education	6-8	8-10	8-10	4-8
Military Training	12	-	-	-
Music or Fine Arts	4-6 Se.1	4-6 Se.1	2-6 Se.1	2-6 Se.1
Classical Chinese (I,II)	-	8-14	4-6	4-6
English (I,II)	3-8	14-16	14-16	6-16
Chinese,French,German	-	10-12	10-12	6-10
Japanese, Spanish		Se.1	Se.1	Se.1
Home Economics(Girls)	-	8-10	8-10	10-38
Industrial Arts(Boys)		Se.1	Se.1	Se.1
Agriculture,Commerce	-	8-10	8-10	-
Technical, Fisheries	-	Se.1	Se.1	
Elective	-	0-8	0-8	0-8
Sub Total	88-102	90-116	90-116	52-106
Extracurricular Activities		12		
Grand Total		204-216		

. (I) required subject
. (II) elective subjects by course and programme
. I unit means a period of 50 minutes per week during one term (17 weeks) One week equals 5½ days
. Individual high schools, by choice, may increase 10th grade required subject areas from 88 to 102 units. This allows for example, a math, science or language emphasis.
The same approach is allowed for 11th and 12th grades
. Se. select.

SOURCE:
Ministry of Education (Korea),
Report to the ICE, Geneva,
9-17 January, 1989, p.18.

Similar information on Nigeria, giving details on junior secondary and senior secondary curriculum was not available to the researcher. Hence in discussing curriculum at these levels, less emphasis will be put on Nigeria than on Kenya and the Republic of Korea.

The junior secondary school curriculum in Nigeria, however, is both pre-vocational and academic. Pre-vocational subjects taught at this level include: Agriculture; Introductory Technology (Wood Work, Metal Work, Electronics, Building Construction and Automechanics); Local Crafts; Home Economcis; Music; and Business Education. These subjects provide introductory skills not tied to any particular trades. Further the system provides for individual schools to adapt and adopt any of the above options as compulsory subjects based on the localized occupations. The Senior Secondary Curriculum consists of Technical Drawing, Woodwork, Book Keeping, Home Economics, Agricultural Science, Electronics, Automechanics and Metal work as pre-vocational subjects all of which are electives.

There are some common features in the secondary school curricula of the three countries: they all

entail core and elective subjects. Pre-vocational subjects are among the electives; and they all show an attempt to vocationalize general education. Further, their modes of vocationalization are largely similar. There has been a general shift from a bi-partite model in which academic schools and technical schools co-existed to a comprehensive school model. The emphasis now in all the countries is to integrate pre-vocational subjects within the formal school curriculum while operating technical institutions as post-school establishments, providing alternative routes to further education and training. However, Korea still operates a bi-partite model at high school level: the general (academic) high schools and the vocational high schools.

One notable difference is that while pre-vocational subjects are offered without discrimination to both boys and girls in Kenya and Nigeria, the girls in Korea are mainly channelled to Home Economics. This is true, but only at official policy level. Deeper analysis reveals some two 'hidden' shortcomings in the Kenyan curricula.

The first problem may be attributed to historical as well as cultural reasons. While the curriculum is intended to give equal opportunities to students, both

girls and boys, some disparities between the two sexes still persist in the area of vocational specialization. At secondary school level, most girl-schools opt for only Home Science, leaving the rest of the vocational subjects to boy-schools. Thus the 'carry-over' effect of the previous system where Home Science was predominantly for girls still persists to a large extent.

The second problem is linked to the degree to which the system helps to reinforce, either positively or negatively the status of technical or vocational education. The grouping of subjects for examination purposes, as shown in 4.6 has two implications:

(i) a student offering pure sciences (physics, chemistry and biology) can technically leave out all pre-vocational subjects by choosing either a foreign language or even Economics since he is given a wide selection; (ii) usually, only well established schools which select best students for form one intake offer pure sciences. Most schools that are not well equiped opt for physical sciences and biological sciences, and also take students with comparatively low performance at KCPE. Since these are the same students who by design are bound to take pre-vocational subjects in their last two years of secondary education, it follows that from low down the ladder, relatively weaker students

will be channelled to technical careers. This is unlike Korea which channels most of its more able students to technical careers.

Moreover, implementation of the pre-vocational curriculum in Kenya has faced serious problems. This ranges from lack of qualified teachers for pre-vocational subjects, an overcrowded curriculum relative to the time available for its coverage, with the result that it suffers from poor coverage in scope and content, to lack of physical facilities in terms of buildings (workshops and home science blocks) and equipment or tools. For instance, out of 9,593 workshops needed by all schools in the country, only 1414 or about 15% of them had been constructed and completed by March 1987, while only 756 or 7% of the 9,721 Home Science blocks had been completed.[12] This shows that Kenya's stress on the preparatory role of pre-vocational education may be difficult to implement. Nigeria suffered similar obstacles in its implementation of the 6-3-3-4 system of education.

Briefly therefore, we can draw the following conclusions from this chapter.

Conclusion

A nation's concept of pre-vocational education tends to evolve over time, in direct response to the changing patterns of economic growth, as well as socio-political systems. Generally this concept, as reflected in the various programme objectives considered, is three dimensional. In the first dimension, pre-vocational education is largely perceived as a means of producing students who have a range of both practical and commercial skills that would give them the capacity for either wage or self-employment. In the second dimension, pre-vocational education is seen to play mainly an exploratory function: students are exposed to various occupational skills with a view to helping them make proper career choices based on their interests and talents. In the third dimension pre-vocational education is largely seen as a means of closing the gap of social inequalities.

Kenya subscribes to the first dimensional concept, although as we said earlier, this is likely to change in future. Nigeria and Korea mainly subscribe to the second dimensional concept, while the third is characteristic of developed countries: notably U.S.A. and Britain. It must, however, be realized that the concept of pre-vocational education held by any country may have either positive or negative implications to

career mobility. For instance, where the expressed aim of pre-vocational education is to play an exploratory function or lay a foundation for further training, the students' career mobility is a policy inherent within such a concept. But where preparation for employment is the main function of pre-vocational education, especially at primary or elementary school level, the students' prospects of advancement are largely curtailed. This is particularly true for those who opt for employment after completing only lower levels of formal schooling.

The overall structure of the educational system has relatively little influence to career mobility of students at primary or elementary school level, especially in the Republic of Korea and Nigeria. However, at secondary school levels, its influence becomes more significant in all the three countries. In particular, the current policy being pursued by Kenya and Nigeria of making secondary schools comprehensive and hence exposing all students to vocational and technical subjects, seems to have achieved little in terms of attempts to channel bright students to technical careers. This has further been aggravated by the way the curriculum has been developed. For instance, despite the official rhetoric about the importance of technical

education, no pre-vocational subject can be traced in the core curriculum offered at upper secondary (form 3 and 4) in Kenya, high school in the Republic of Korea, or senior secondary in Nigeria. This reflects a weakness rather than strength in the prevailing policy aimed at raising the status of technical and vocational education in general and pre-vocational education in particular within the school system.

However, as noted earlier, the Republic of Korea has made some innovative attempts of channeling more able students to technical careers through its recruitment policies and other incentives such as tuition exemption and scholarships for students in vocational high schools.

The degree of vocationalization of the primary school curricula is more pronounced in Kenya and Nigeria than it is in the Republic of Korea. In the latter case, greater emphasis is put on pre-vocational education after middle school level.

This difference in the levels at which significance is attached to pre-vocational education is reflective of the level of industrial development. Kenya and Nigeria are still at lower stages of industrial

development and hence technological advancement. The majority of their industries are involved in agricultural activities. Thus a greater proportion of the technical personnel required should be skill-oriented and hence the emphasis on pre-vocational education even at primary school level.

However, Korea's earlier sources of growth, which consisted mainly of agricultural and manufacturing activities geared to the domestic market, have largely shifted to export-led high-tech production. Consequently, there is a shift of emphasis from skill-intensive to a knowledge-intensive labour force. That is why basic sciences are given more emphasis than specific vocational skills at lower levels of education in the Republic of Korea.

It may be noticed that in this chapter, we have not analysed the financing of pre-vocational education, though it is an important variable to career mobility. This is due to the fact that data on financing of pre-vocational education *per se* could not be easily obtained, since this type of education is not treated as a separate entity but rather within the framework of general education at primary and secondary school levels. It is only at post-school level that separate data on financing

of technical and vocational education is available especially for Kenya and Korea. In the next chapter on technical and vocational education in post-school institutions, therefore, we shall analyse financing as a variable, in addition to other variables discussed in this chapter.

FOOTNOTES

1. Commonwealth Secretariat, "Vocationally Oriented Education in Nigeria". Country Paper Presented to the 10th Conference of Commonwealth Ministers of Education, Nairobi, Kenya, 20th-24th July, 1987, p. NIG.2.

2. Ibid.

3. Republic of Korea, Educational Development in Korea: 1986-1988. Report to the 41st Session of the International Conference on Education, Geneva, 9-17 January, 1989. Seoul, Ministry of Education, 1989, p.12.

4. Ibid., p.13.

5. Pat Ainley, From School to YTS: Education and Training in England and Wales, 1944-1987. Open University Press, Stony Stratford, 1988, p.45.

6. Repuglic of Korea, Handbook of Korea. Ministry of Culture and Information, Seoul, 1987, p.452.

7. Ibid., p.453.

8. Ibid., p.454.

9. Ibid., 457.

10. Federal Republic of Nigeria, National Policy on Education. Ministry of Education, Lagos, 1976, p.8.

11. Federal Republic of Nigeria, Education in Nigeria. Federal Ministry of Information, Lagos, 1986, p.20.

12. Annual Report by Ministry of Education, Kenya, 1987, (Appendix).

CHAPTER FIVE

POST-SCHOOL TECHNICAL EDUCATION AND TRAINING : KENYA, REPUBLIC OF KOREA AND NIGERIA

CHAPTER 5

Introduction

In the preceding chapter, we analysed pre-vocational education in primary and secondary schools: the concept, modes of provision, curricula, examinations and certification. We saw that in all the three countries, one of the common purposes of pre-vocational education is to lay a foundation for further training, mainly in post-school technical institutions. Further, primary and secondary schools influence career mobility in two ways: through their selective function by channeling a certain type of students into vocational or technical careers; and the effectiveness with which they reinforce, either negatively or positively, the pupils' attitudes towards technical and vocational occupations.

In this chapter, we shall examine post-school technical and vocational education and training in Kenya, the Republic of Korea and Nigeria. In particular, we shall compare their structural organisation, examinations and certification, financing, and recent policy reforms with specific reference to career mobility. However, our discussion will feature mainly Kenya and the Republic of Korea, with less emphasis on Nigeria due to limitation of data and other relevant information on that country.

Structure

The different structures of post-school vocational and technical training in operation within the three countries, is reflective of the diverse ways in which each country has responded to challenges of ensuring the supply of adequately trained manpower for economic and technological development. A common purpose of all the structures, however, is to provide further technical and vocational training of a specialized nature to interested and suitably qualified individuals.

Three aspects of the structure may be identified: Agencies, Institutions and Programmes. The term Agencies refers to the type of bodies or organizations involved in the provision of post-school technical education and training. However, Institutions refer to the places where this education and training is offered, while programmes refer to the type of courses offered. We shall now analyse in detail each of these aspects.

Agencies

The main agencies involved in the provision of post-school technical and vocational education and training are largely the same in all the three countries. These agencies are: the Government, Private

firms, religious and other various non-governmental organizations. In some cases, the government appoints or establishes an agency charged with specific tasks to perform on its behalf. Examples are: the National Industrial Training Council (NITC) in Kenya established by an Act of Parliament in 1971;[1] the Korean Vocational Training and Management Agency (KOVTMA), established in 1981;[2] and the Industrial Training Fund (ITF) in Nigeria.

Despite the differences in administrative organization, Kenya and Korea being centralized governments while Nigeria being more decentralized due to its Federal and State System of administration, the government (including the federal Government of Nigeria) in each of the three countries has an overall control on the pattern of Provision of Post-school technical education and training. This control is achieved in three main ways: through direct government funding of certain programmes; through the formulation of national policy on manpower training and utilization; and through National Development Plans by identifying areas of priority for national industrial or technological development with accompanying incentives to investors, which may include various subsidies or tax exemption. Further, government control is reinforced by the requirement that any post-school technical

training institution be licenced or approved by the state. Usually, the justification given for this tendency of government control on post-school education and training in general, and technical training in particular, is: uniformity of standards; relevance of courses to national socio-economic requirements; and enhancement of quality. This control, however, is not unique to Kenya, the Republic of Korea or Nigeria but is a common feature in most countries with a centralized educational system.

Besides the government, the second most important set of actors in providing formal training at post-school level are the industrial firms. This is true especially for Kenya and the Republic of Korea, as illustrated by the following data. In 1985, out of 6,050 people who were undergoing formal technical training in Kenya, 30% were in-plant trainees in various firms, while 70% were in government-sponsored technical institutions.[3] For the Republic of Korea, out of 78,761 trainees registered for training in post-school technical and vocational institutions, 61% were in-plant trainees in various firms, 34% were in government-sponsored institutions and 5% were in other authorized institutions.[4] This data further shows that unlike Kenya, where most formal technical training seems to be concentrated in government institutions, most of

the Korean technical manpower is a product of in-plant training by various industrial firms.

Other agencies mentioned earlier, religious and other non-governmental organizations, are involved in the provision of post-school technical or vocational training but mainly at lower levels. Their involvement or contribution takes various forms: setting up their own vocational centres to train various categories of people; direct sponsorship of trainees to available technical institutions other than their own through the provision of full schoalrships or grants; and direct financial support for various projects aimed at promoting technical education and training at post-school level. Most activities of these agencies fall under non-formal technical or vocational training, which is not the concern of this study.

However, in the light of the above discussions, it may be partially concluded here that the provision of post-school technical and vocational education and training is a responsibility which calls for partnership between the government, private firms and other organizations. The degree of involvement by any of these agencies, however, varies from one country to another.

Institutional Framework

Having outlined the main agencies involved in the provision of post-school technical education and training, we shall now examine the various institutional set-ups in which it is provided.

In Kenya, post-school technical education and training entails both post-primary and post-secondary institutions. The Nigerian institutional framework of post-school technical and vocational education and training is, however, classified at three main levels: post-primary; post-junior secondary; and post-senior secondary. But for the Republic of Korea, it entails largely post-high school (and to a lesser extent post-middle school) technical and vocational training institutions. These differences may be attributed to the structural diversity of the educational systems as well as variations in the transition rates referred to earlier. Figures 5.1, 5.2 and 5.3 show the institutional set-up of post-school technical training in Kenya, the Republic of Korea and Nigeria respectively.

5.1: TECHNICAL TRAINING INSTITUTIONS IN KENYA

LEVEL	TYPE OF INSTITUTIONS
POST-PRIMARY	1. Technical Training Institutes 2. Youth Polytechnics 3. Christian Industrial Training Centres 4. National Youth Service
POST-SECONDARY	1. Universities 2. National Polytechnics 3. Harambee Institutes of Technology 4. National Industrial Training Centres 5. Ministry/Parastatal/Company Training Schools 6. Technical Teacher Training

NOTE: In reality, many post-primary technical institutions in Kenya admit secondary school leavers who fail to secure a chance in post-secondary institutions.

5.2: TECHNICAL TRAINING INSTITUTIONS IN THE REPUBLIC OF KOREA

LEVEL	TYPE OF INSTITUTION
POST-ELEMENTARY SCHOOL	Trade Schools
POST-MIDDLE SCHOOL	1. Higher Trade School 2. Vocational High Schools
POST-HIGH SCHOOL	1. Universities 2. Technical Colleges 3. Junior Technical Colleges 4. Korea Correspondence College 5. Vocational Training Centres 6. In-plant Training Centres 7.* Kyunggi Technology Open College

* The Kyunggi Technology Open College, the first one in Korea, was established in 1982. By 1987, six other Technology Open Colleges had been established, with total enrollment of 30,000 students.[5] "The purpose of the open college programme is to offer an opportunity to industrial workers who have graduated from high school and who have missed the opportunity to receive regular college education to pursue higher education".[6] For admission, usually one year of work-

experience with an industrial firm is required. Further, allowance is made for students to request the number of credit hours of courses according to their circumstances. Hence, this type of flexibility within the system "allows the students to schedule their time to co-ordinate their work hours and school time.[7]

5.3: TECHNICAL TRAINING INSTITUTIONS IN NIGERIA

POST-PRIMARY	Vocational Training Centres
POST-JUNIOR SECONDARY	Technical Colleges
POST-SENIOR SECONDARY	1. Universities 2. Colleges of Technology 3. Polytechnics 4. Technical Teacher Training 5. Ministry/Parastatal/Company Training Centres

One common feature among the three countries, that emerges from the institutional set-up shown in 5.1, 5.2 and 5.3, is that formal technical training is concentrated at post-secondary level. This is reflected in the number and type of institutions established at each level of education. For instance in Kenya, out of 20,391 trainees undergoing formal technical training

below university level in 1988, 65% were in exclusively post-secondary institutions.[8] The corresponding figure for Nigeria in 1986 was 66%,[9] while that of the Republic of Korea, though not available, is expected to be nearly 100%.

Programmes

We shall now analyse the education and training programmes offered, and hence the occupational hierarchy of technical manpower in the three countries.

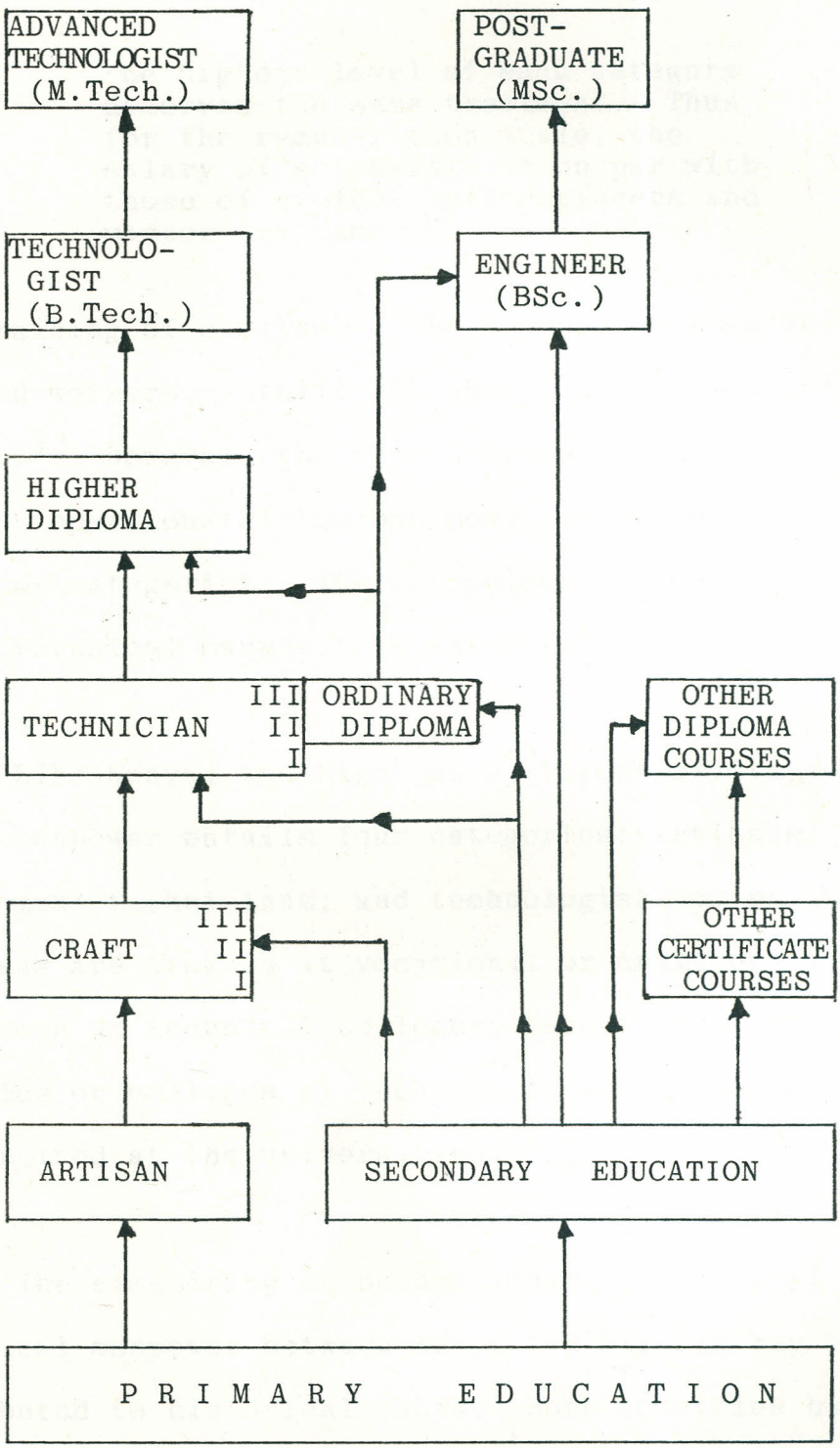
In Kenya, the educational hierarchy of technical manpower, as already seen in chapter 3, ranges from the artisan at the bottom of the professional ladder to the engineer at the top, with the craftsman and technician sandwiched between them. Artisans are mainly trained at Technical Training Institutes and Youth Polytechnics, while craftsmen are trained at Harambee Institutes of Technology and National Industrial Training Centres. Technicians are trained mainly at National Polytechnics and engineers at Universities.

Courses offered differ both in duration and content.[10] On average, the duration of an artisan course is 2 years, craft 3 years and technician 3 years. An engineering degree course took 3 years but

will now take 4 years under the current 8-4-4 system of education. Further, the proportion of practical to theoretical work covered by the trainee at each level falls significantly as one moves up the ladder. The specific ratio of the practical to the theoretical content of the course by level is: artisan 90:10; craftsman 80:20; technician 60:40; and technologist 10:90. Figure 5.4 shows the programme linkages and the occupational hierarchy of technical manpower in Kenya.

In the Republic of Korea, there are three categories of technical manpower: engineers, technicians and craftsmen (or skilled workers). Engineers are university or four-year college graduates, while technicians are junior technical college graduates. However, skilled workers are either graduates of vocational high schools or those who have undergone occupational training. One of the stated objectives of occupational training in Korea is to "support the vertical mobility of skilled workers and their contribution to the nation's economic development."[11]

5.4: PROGRAMME LINKAGES AND THE OCCUPATIONAL HIERARCHY OF TECHNICAL MANPOWER IN KENYA



Although the Korean technical manpower is classified into three categories, the system is organized in such a way that:

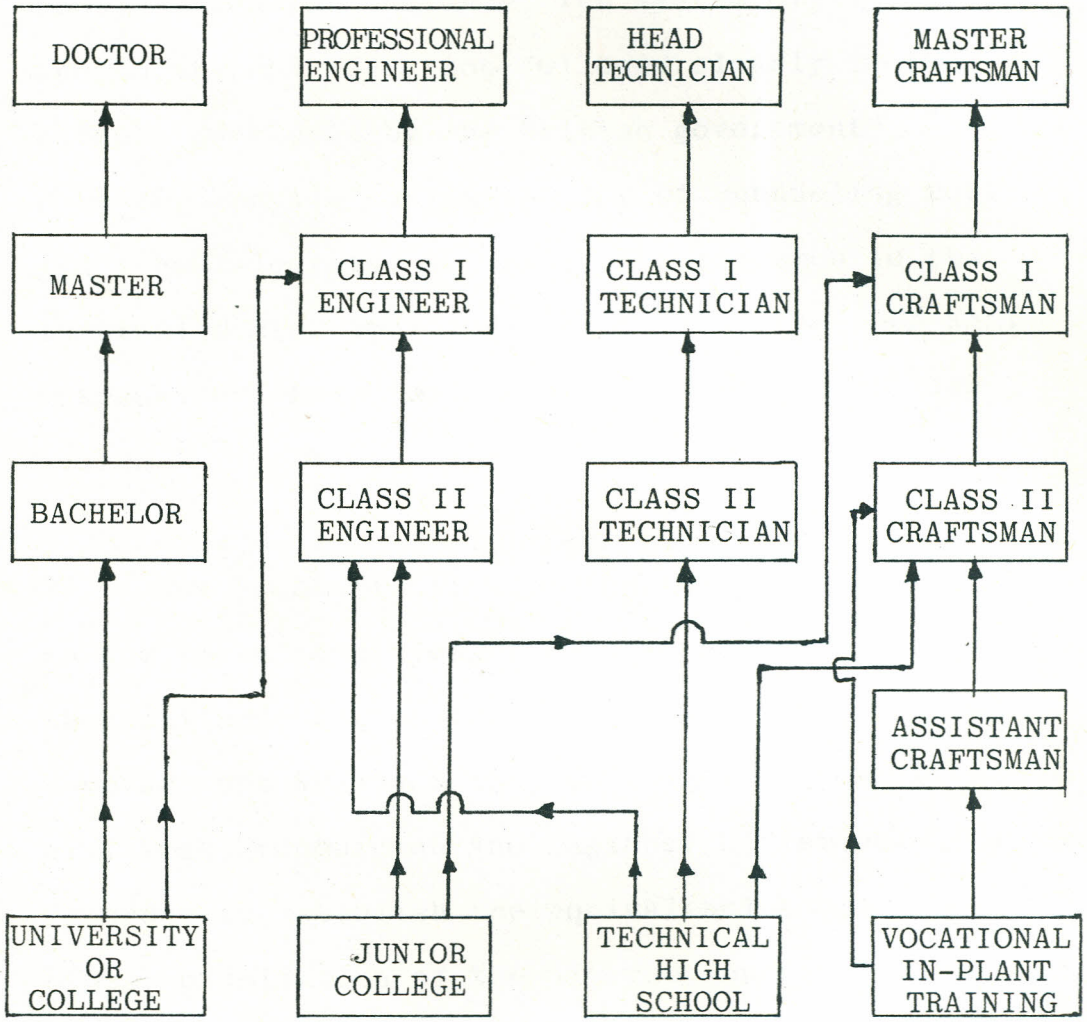
> the highest level of each category deserves the same treatment. Thus for the remuneration scale, the salary of scientists is on par with those of professional engineers and master craftsmen.[12]

The training of craftsmen, who constitute most Korean skilled workers, entails 70% shop practice and 30% theory.[13] However, the time devoted to shop practice falls proportionately as one moves to technician and engineer categories. The occupational hierarcy of the Korean technical manpower is shown in table 5.5.

Like Kenya, the Nigerian hierarchy of its technical manpower entails four categories: artisans; craftsmen; technicians; and technologists or engineers. Artisans are trained at vocational or craft centres, craftsmen at technical colleges, technicians at polytechnics or colleges of technology, while engineers are trained at the universities.

The similarity in occupational hierarchy of the technical manpower between Kenya and Nigeria may be attributed to historical facts. Both countries have clearly modelled their structures after the British

5.5: PROGRAMME LINKAGES AND THE OCCUPATIONAL HIERARCHY OF TECHNICAL MANPOWER IN KOREA



NOTE: This exhibit is a synthesis of two sources of information:

1. Vocational Training in Korea, Ministry of Labour, Republic of Korea, 1985, p.29.

2. Technical and Vocational Education: Republic of Korea, Bangkok, Unesco, 1984, pp.42-43.

scheme, which is characterized by a highly institutionalized training system, geared almost exclusively to wage employment opportunities. After Nigeria gained independence for instance, its system of "technical and vocational education followed closely in the pattern developed by the British government".[14] However, Kenya's current policy of channeling most of its school-leavers, artisans and craftsmen to the informal sector employment especially the 'JUA KALI' enterprises shows some departure from the British system.

The classification of the technical manpower in the three countries reveals no major diversities: they all have engineers, technicians and craftsmen. However, the Kenyan, Korean and Nigerian concept of craftsman, technician and engineer differ considerably. In order to establish the equivalencies therefore, a closer examination of the diverse concepts is necessary.

A country's concept of any category of its technical manpower seems to be largely based on three attributes of the individual: level of competency; level of responsibility; and level of formal qualifications or credentials achieved. For convenience, we shall distinguish between the different categories of technical manpower on the basis of their level of

competency, and the corresponding level of responsibility, (usually associated with functions). We shall, however, analyse the formal qualifications of the various categories of technical manpower in the next section under examinations and certification.

A summary of each country's concept of the various categories of technical manpower is given in table 5.6.

From table 5.6, several observations may be made. Firstly, the Kenyan and Nigerian Artisan is an equivalent of the Korean Assistant Craftsman. Both types are single-skilled workers and work under close supervision. Secondly, the Kenyan or Nigerian Technician is an equivalent of the Korean Master Craftsman. This is especially true when the level of responsibility is the only criterion of judgement. It is clear that management and supervision are part of the major responsibilities of a technician in Kenya and Nigeria but a master craftsman in the Republic of Korea. However, when the level of skill competency is the main criterion of judgement, then a Kenyan or Nigerian Technician may be equated to a Korean class II or I craftsman. Thirdly, an Engineer or Technologist in all the three countries is judged with the same responsibilities, namely research,

5.6 : CATEGORIZATION AND CONCEPT OF TECHNICAL MANPOWER : KENYA, KOREA AND NIGERIA

CATEGORY	KENYA*15	REPUBLIC OF KOREA*16	NIGERIA*17
ARTISAN	- A skilled operator with thorough knowledge of techniques and appropriate tools needed to do his job with efficiency and understanding. - Has awareness of the materials and basic principles of the skills.	-	- One who possesses specific practical skills mainly developed on the job - Works under close supervision of skilled or experienced craftsman.
CRAFTSMAN	- Has a thorough knowledge of the techniques and appropriate tools for his trade. - Has an understanding of relevant science and technology applied in his trade.	-	- One who posseses specific practical skills and able to: (i) work with less supervision; (ii) interpret technical drawings and perform all calculations relating to his trade;

* Footnotes refer to sources from which the definitions and hence concepts of the various categories of technical manpower have been adopted.

5.6: Continued

CATEGORY	KENYA	REPUBLIC OF KOREA	NIGERIA
			(iii) demonstrate possesion of sufficeint knowledge of elementary science to understand the materials and processes with which he works.
ASSISTANT CRAFTSMEN	–	Able to carry out production work under supervision of skilled craftsmen	-
CLASS II CRAFTSMAN	–	Has proficiency in production skills equipment operation and maintenance and quality inspection	
CLASS I CRAFTSMAN	–	Should have proficiency in applied production skills, equipment operation and maintenance, and quality inspection that will enable him to play a leading role.	-

5.6: Continued

CATEGORY	KENYA	REPUBLIC OF KOREA	NIGERIA
MASTER CRAFTSMAN	-	The highest level of skilled workers that require capacity to work as production manager and supervisor.	-
TECHNICIAN	- Expected to work in occupations requiring a knowledge of technology and related sciences between that of an engineer or technologist. - Functions include: inspection maintenance; preparation of production information; supervision of production or work controlling of quality. Thus a technician must have; (i) skills to be able to translate the theories of the professional engineer into	Head technician in Korea must posses: a higher degree of knowledge and skill proficiency to carry forward planning; research; analysis; testing; operation; designing; and supervisory role as related to these functions.	- One with a combination of sub-professional knowledge of applied theory with practical qualification of a craftsman. - He carries out the technologist's plans and exercises supervisory responsibilities.

5.6: Continued

CATEGORY	KENYA	REPUBLIC OF KOREA	NIGERIA
	practical solution; (ii) social and supervisory skills for the purpose of leading and directing the work at operational level.		
TECHNOLOGIST OR ENGINEER	- Entails the highest level of decision making in a given problem. - Technologist is expected to: define the problem; analyse it; synthesize the information at hand; design alternative solutions; the best alternative solution to the problem.	Functions mainly involve research and development of products and production processes.11	Responsible for the application of scienticic knowledge and methods to industry

design, development and management. The Korean head Technician however does work which largely overlaps that of an engineer.

These equivalencies however, must be treated with caution for two reasons. First, the issue of cross-national 'equivalences' of technical manpower needs expert inquiry and is in itself a subject of research beyond the scope of this study. For it to be conclusively tackled, an in-depth assessment of the curricula and job-performance of each category of manpower would be necessary. We do not have the time and expertise for that kind of work now. Second, when we talk of the Kenyan, Korean or Nigerian concept of an artisan, craftsman, technician or an engineer, a national concept may be inferred. But this may be misleading, since there are intra-national variations in these concepts. For instance, the concept of an artisan or craftsman may vary from one industry to another, or even from a civil service establishment to a private company establishment.

In the light of these shortcomings, the equivalencies given above should be treated as a general guide for further analysis. However, our main interest is not in the cross-national equivalencies between the various categories of technical manpower but rather

how far the systems in Kenya, Korea and Nigeria promote vertical mobility among these categories. It is on this basis that we shall now compare the modes of recruitment, examination and certification of the various categories of technical manpower analysed above. We shall focus our discussion on Kenya and the Republic of Korea only, since enough information on Nigeria was not accessible to the researcher.

Recruitment, Examinations and Certification

Kenya's mode of recruitment, examination and certification has largely been covered in chapter 3 of this study. However, as a prelude to comparison, we shall give a brief analytical presentation of these three processes in the Republic of Korea.

The examination and certification of the Korean technical manpower is based on the National Skill Certification system. It was established in 1973 by an Act of Parliament,[18] with three main aims: standardization of skill performance competencies; bridging the gap between what is taught in technical institutions and the actual need of industries; and acting as an incentive for those who wanted or aspired to pursue a technical career. More specifically, the aims of the National Skills Certification System are to:

(i) improve the quality of technicians and their skills, thus enhancing their accountability;

(ii) enhance the socio-economic status of skilled workers;

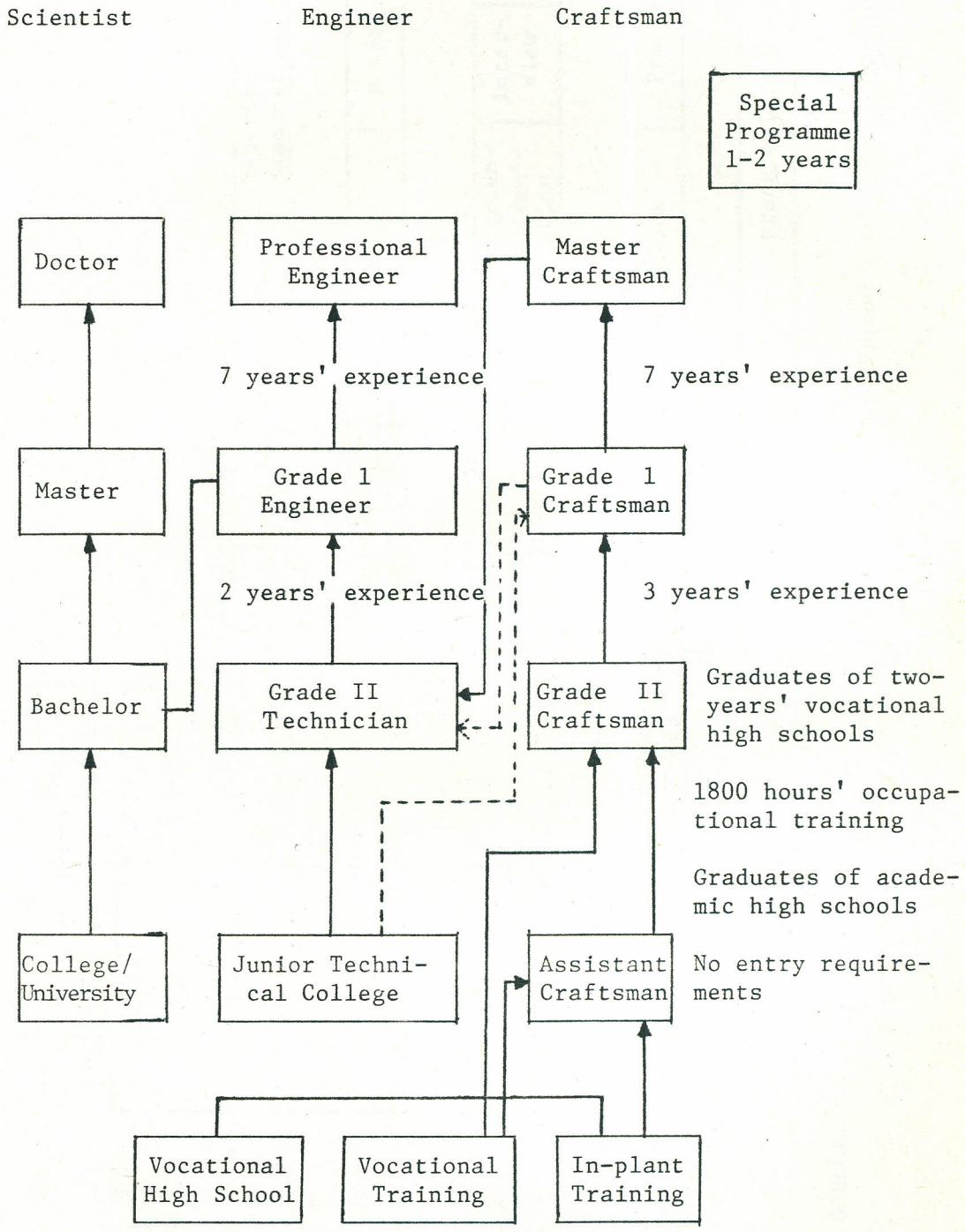
(iii) promote the development of industry-based training; and

(iv) standardize qualification grading and performance criteria.[19]

The eventual aim of the scheme is to "root out the social norms of despising skill works and create a supportive social climate for their development".[20] Under this scheme, the law regarding technical qualification, which was revised in 1983, now provides that those with certification obtained through this scheme must undergo in-service training after 5 years of continuous service. Thus Korea is moving towards a stage of mandatory advanced training for her technical manpower.

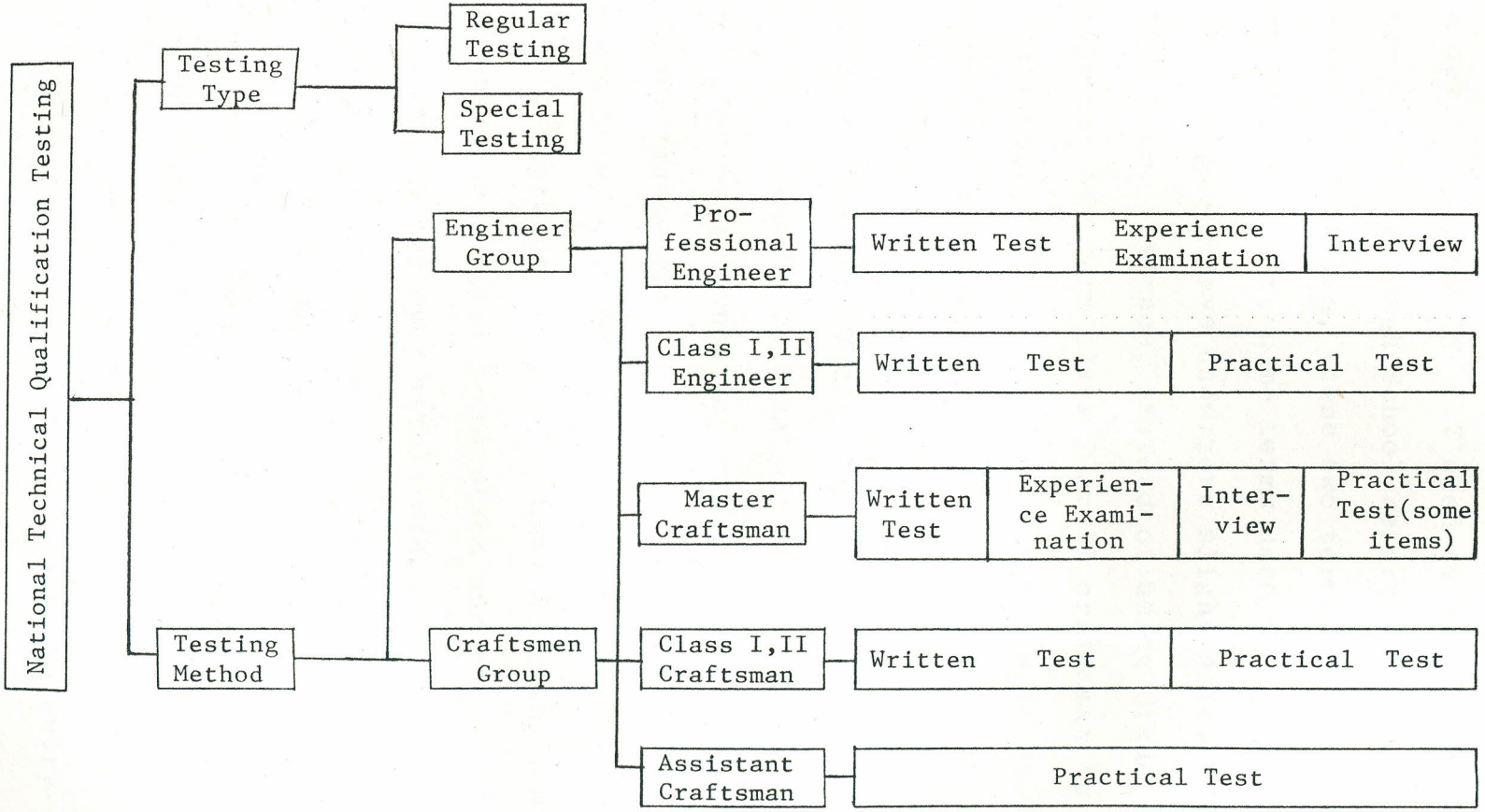
Figure 5.7 shows the patterns of mobility within the National Skills Certification System, while figure 5.8 summarises the Technical Qualification Testing Method applied to all technical manpower in the Republic of Korea.

5.7: MOBILITY WITHIN THE NATIONAL SKILL CERTIFICATION SYSTEM IN KOREA



SOURCE: Bulletin of the Unesco Regional Office for Education in Asia and Oceania. Number 21, June 1980, p.200.

5.8: THECHNICAL QUALIFICATION TESTING METHOD IN KOREA



SOURCE:

Vocational Training in Korea, Ministry of Labour, Republic of Korea, June, 1985, p.32.

A few terms used in 5.7 need to be clarified. The term Vocational High School refers to a Technical High School. In Korea, these two terms are used interchangeably. Secondly, some terms used in classifying technical manpower have undergone slight alterations over time. For instance, instead of using Grade I or II craftsman, the term class I or II craftsman is used. This explains why the term 'Grade' appears in E5.7 (1980) while 'Class' appears in E5.5 (1985).[21]

Further, the term Vocational Training refers to programmes offered in national or public institutes, aimed at providing foundation building, improvement of job performance skills, and the acquisition of new skills and knowledge for either job transfer or for improving the productivity. In-plant training however, entails both the initial preparation and retraining of employees by the employer within his firm, with other employers jointly or by the organization of employees collectively. Firms employing more than 300 employees are by law required to provide in-plant occupational training programmes.[22]

It may be seen from 5.9 that while no entry requirement is imposed in terms of school attainment for an assistant craftsman, a class II craftsman must meet the following conditions: certification as an

assistant craftsman; completion of at least two years of vocational high school education; completion of an academic high school; completion of more than 1,800 hours of occupational training;

or completion of training courses designated by the Ministry of Science and Technology.[23] In addition, as shown in 5.8, they must pass a written and practical test.

For one to be recruited and certified, a class I craftsman, he should meet the following requirements; more than three years of experience as class II craftsman; completion of junior college or vocational high school; completion of two-year course offered by the Korean Precision Machinery Centre; or completion of other courses designated by the Ministry of Science and Technology.[24] In addition, he must also pass a written and practical test.

Tougher conditions are set for an aspirant Master Craftsman. In addition to having 7 years of experience as a class I craftsman and undergoing a mandatory retraining course at the Master Craftsman College, he must sit and pass: a written test; experience examination; interview; and a practical test in some selected items.

The procedure followed for the recruitment, examination and certification of technicians is largely similar. Table 5.9 gives a summary of the criteria used.

5.9 CRITERIA OF THE NATIONAL SKILL CERTIFICATION SYSTEM FOR TECHNICIANS.[25]

LEVEL	CRITERIA
HEAD TECHNICIAN	Requires a higher degree of knowledge and skill proficiency to carry forward planning, research, analysis, testing, operation, designing and supervisory role as related to those functions. He should meet the following requirements: (a) more than seven years of experience as Class I technician; (b) more than nine years of experience as Class II technician; or (c) more than seven years of experience after the graduation from junior college and vocational high school.
CLASS I TECHNICIAN	Requires basic engineering theory and applied skill with the following requirements: (a) more than two years of experience as class II technician; (b) graduation from an engineering college; or (c) more than two years of experience as a graduate of junior college or vocational high school.
CLASS II TECHNICIAN	Requires basic skill theory and applied skill with the following requirements. (a) certified as a master of class I skilled worker;

5.9: Continued

LEVEL	CRITERIA
	(b) graduation from junior or vocational high school; (c) completion of two-year course at the Korea Precision Centre; or (d) completion of other training, designated by the Ministry of Science and Technology.

It is evident from the above analysis that there are more points of diversity than commonality, between the Kenyan and Korean systems. While Korea is characterized by a highly centralized system of examination and certification for her technical manpower, Kenya's system has hitherto been largely decentralized. In Korea, the certification of all technical manpower, ranging from the assistant craftsman to the professional engineer, is governed by the National Skill Certification System. Even university graduates pursuing engineering courses are covered through accreditation. It is in this perspective that the Republic of Korea has been rated as "an example of a country in which vocational training, although still pluralistic in its delivery, is to some extent moving closer towards a monolithic system following the recent introduction of a strong tripartite umbrella organization [KVOTMA]." [26]

In Kenya, however, several bodies, agencies as well as individual institutions have been responsible for the examination and certification of technical trainees. Examples are: The Ministry of Labour; Harambee Institutes of Technology; Youth Polytechnics; Parastatals and private companies such as the Kenya Power and Lighting and D.T. Dobie, among others. There have been several problems associated with this practice in Kenya, the crucial ones being lack of performance criteria, and programme duplication.

When the government established the National Industrial Training Council, it tried in a way to tackle these problems particularly in the private sector. However, Kenya is now pursuing a policy geared towards a centralized system of examinations and certification. This is reflected in the government's recent adoption of the recommendation of the Presidential Working Party on Education and Manpower Training for the Next Decade and Beyond that:

> The Kenya National Examinations Council be responsible for all national examiantions and certification, except those of the universities, and that its capacity be expanded and strengthened to cope with its increased responsibilities.[27]

The second major difference is in the structural organisation of the system of certification. While the Korean system allows for four paths, each with distinct certification modes: scientist; engineer; technician; and craftsman and all of which allow mobility to the top of the ladder, the Kenyan system largely allows for only one path as an avenue for upward mobility, in other words, if an artisan has to rise up the ladder, he must pass through the ranks of craftsman, technician and then finally engineer. Even under the 8-4-4 system, the artisans and craftsmen are largely restricted to a single path for their vertical mobility. The only difference seems to be that if they were to reach the top of the ladder, they would be called technologists rather than engineers. However, as we saw in chapter 3, chances of artisans rising to that level are very low.

The major common feature between the two countries seems to be in the degree of flexibility in their admission on recruitment procedures. In both countries, the systems in principle, allows for both fresh high school entrants as well as in-plant or in-service trainees who have had initial training, to register at various levels for further training. However, while the Kenyan system allows a fresh high school leaver direct entry into the highest level of non-degree technical training

(Higher Diploma), admission to such levels in Korea is not allowed for a fresh high school leaver. We may therefore conclude that the Kenyan system is more flexible to school leavers with higher academic qualifications but restrictive to those whose only criteria for advancement through further training would be the initial training undertaken and formal qualifications achieved. This is particularly true if such training was taken at lower levels: artisan and craftsman. In the Republic of Korea, however, the system affords more flexibility to those with initial vocational or technical training and qualifications, than those without.

Financing

In Kenya, as we have already seen in chapter 3, cost-sharing is the government policy of financing technical and vocational education at all levels, especially in public institutions. In pursuance of this policy, the government will continue providing facilities for maintained post-school training institutions such as Technical Training Institutes and National Polytechnics, while students will pay the full cost of boarding and feeding, where applicable.[28]

Clearly, the cost and financing of education and training is the most crucial factor that largely inhibits educational development in Kenya. It was noted for instance that:

> As of 1987, over 35% of the total public sector recurrent budget was taken up by education alone, compared to 15% in the 1960's and 30% in 1980. If budgetary allocations for the training activities of the Youth Polytechnics, National Industrial Training and the Directorate of Personnel Management (DPM) are taken into account, this proportion approaches 40 percent.[29]

Thus while the percentage of the national budget allocated to education and training in Kenya has continued rising in recent years, that of the Republic of Korea has remained constant since 1985. The comparative figures for Kenya[30] and Korea[31] are shown in table 5.10 below.

5.10: EDUCATION BUDGET AS PERCENTAGE OF TOTAL GOVERNMENT RECURRENT EXPENDITURE

YEAR	KENYA	KOREA
	%	%
1984-1985	29.8	-
1985-1986	35.8	20.3
1986-1987	36.4	20.0
1987-1988	37.7	20.1

The second policy that the Kenya government is pursuing as a means of financing higher edcuation, including technical education and training is by:

> encouraging education institutions such as universities, Institutes of Technology and Polytechnics, to be economically productive in order to provide for some of their needs.[32]

The main strategy has been to encourage such institutions to establish production units. The units are then expected to generate revenue through sale of products. The revenue so generated may then be used to subsidize students' fees. This policy has been in operation in some Institutes of Technology for quite sometime now, and the results have been encouraging. For instance, the Kiambu Institute of Science and Technology generates funds through two sources: sale of furniture from its carpentry production unit; and sale of coffee from its well managed plantation. Though not all institutions have big farms to enable them to venture into agricultural produce, they can still establish production units in their various departments, taking into account the social and economic demands of the environment in which they are situated.

As we have already seen, one of the important avenues of training technical manpower in all the three countries is through in-plant or apprenticeship

schemes. The financing of this type of training, in the three countries, has largely taken the same approach: the establishment of the Industrial Training Levy Fund. We shall briefly examine how the levy fund operates in each of the three countries.

In Kenya, deliberate steps towards the establishment of the training levy fund may be said to have started being taken before independence, but intensified after independence. Prior to the formal establishment of the levy fund, two important steps, which had various implications to industrial training, were taken. The first one was the introduction of the Industrial Training Ordinance in the late 1950's, "which formally established a system of 4-5 year in-plant apprenticeships for craft trainees".[33] The second one, which came as a result of ILO Report (1965) to the Government of Kenya on the Development of Vocational Training, was the establishment of the Industrial Training Centres (ITC's).[34] These centres were aimed at providing "theoretical instruction for craft apprentices that up until then had been lacking, a lack which, it was claimed, seriously curbed the growth of craft apprenticeship.[35]

The Training Levy-Fund scheme was ultimately introduced in 1970, through the passing of the Industrial

Training Amendment Act 10. P. Bennel argues that the introduction of the levy-fund scheme was largely due to reluctance among employers to sponsor craft trainees, which necessitated legal government intervention. More specifically, he says:

> By late 1960's, however, the failure of employers, especially in the private sector, to sponsor the number of apprentices considered necessary to overcome existing shortages of craftsmen and provide for the longer-term manpower requirements of the development process prompted the Kenyan state to adopt a more interventionist training strategy.[36]

Under the levy-scheme, an employer who employs four or more people is required to pay levy into the levy fund through the office of the Director of Industrial Training. The amount of levy to be paid by employers, who are currently categorized into eleven sectors of the economy depending on their major line of activities, is agreed upon by the National Industrial Training Council (NITC). The NITC is a tripartite body, whose members are drawn from the government, employers and employees. The employers are represented on the council by the Federation of Kenya Employers (FKE) while employees are represented by the Central organization of Trade Unions (COTU).[37] Through this scheme, employers are supposed to be reimbursed part or most of the training expenses of

the indentured learners, craft apprentices, technician apprentices, and management and supervisory staff. Further, training expenses incurred when sponsoring employees for skill upgrading courses are reimbursed from the levy fund.

However, the condition for reimbursement is that such training must have been undertaken at one of the Directorate of Industrial Training Centres, or any other institution approved by the Directorate.

While introduction of the training levy scheme was expected to enhace co-operation between the government and industry, as well as the quality and quantity of technical manpower in Kenya, a number of challenges have limited its achievements. For the purpose of this study, however, we shall consider two factors crucial to career mobility: employers' attitudes to the levy scheme, and DIT's administrative machinery.

Firstly, employer representation on the tripartite decision-making body (NITC), "has been dominated by the relatively few industrial enterprises that have constituted the main source of private-sector apprentice sponsorship".[38] The implication is that the training levy grant scheme has not succeeded in inducing

smaller enterprises to sponsor craft apprentices as was originally intended. The reluctance of most enterprises to sponsor apprentices for training is attributed to two facts: a negligible demand for formally trained craftsmen due to the limited-skill requirements of the production process, relative to the training costs; and high government controlled wage differentials between skilled and unskilled workers.[39] Thus rather than feel obligated to train because of their contribution to the levy fund, "these enterprises prefer instead to treat the levy as an additional tax that, wherever possible, they will try to pass on to the consumer."[40] Consequently, a school-leaver who joins such a firm or enterprise has his prospects for career mobility through further formal training largely curtailed.

The second major pitfall within the operation of the training levy fund scheme may be detected in the DIT's administrative machinery. For instance, the Levy Inspectors, who are employees of DIT, are authorized to collect monies from employers. In addition, they are required, among other things, to:

(i) Keep employers informed of the training activities offered and ongoing at the Industrial Training Centres, the Kenya Polytechnic and other relevant training opportunities; and

(ii) Advise employers on the availability of Training Grants for craft and technician apprentices.

Clearly, while DIT endeavours to keep employers well informed about its training activities, it apparently does little in terms of directly keeping employees well informed as well. If this is left to employers the majority of who, as we have already seen, are sceptical about the formal training of skilled workers, there is a possibility of leaving employees largely ignorant of the opportunities available, which in effect is a clear antidote to the employees' career mobility. Whereas, this task of keeping employees well informed of their rights and opportunities could be done by trade unions, experience in Kenya shows that majority of these unions do little more than fighting for wage increments and reinstatement of their members in case of termination from employment by their employers.

In Nigeria, the National Apprenticeship Scheme was established in 1978 under the auspices of the Industrial Training fund (ITF), in a bid to establish national standard and competence.[41] However, little information was available to the researcher on how it operates and problems encountered.

In the Republic of Korea, the levy system was established in 1976.[42] As we have already seen, the law in that country requires all firms with more than 300 employees to provide some enterprise training. However, like Nigeria, little information was available as to how the levy system works. Hence we can make little comparison about this aspect of funding technical training between Kenya, Republic of Korea and Nigeria.

Conclusion

The following overall conclusions may be drawn from this chapter:

The provision of post-school technical education and training, as evidence from the three countries shows, calls for partnership between the government, private firms and other non-governmental organizations. Thus in order to enhance the development of further technical education and training, there is need for greater co-operation between the government and private firms in particular.

In all the three countries, the government (for the case of Nigeria, the Federal Government) has an overall control on the pattern of provision of post-

school technical education and training. This control is achieved in three main ways: through direct government funding of certain programmes; through the formulation of national policy on manpower training and utilization; and through National Development Plans which identify priority areas for national industrial or technological development. The implication is that this governement control can be positively used to influence career mobility of the technical personnel. However, the extent to which it has been used is debatable.

There is a general tendency to concentrate formal technical training at post-secondary school level, especially in the Republic of Korea and Nigeria. Kenya's current policy however, is to expand technical and vocational training opportunities at post-primary level, with the target group being the majority of primary school leavers who may not have an opportunity for further formal secondary education. This policy, however, is likely to change in future as the level of educational development rises.

None of the structures of the countries studied offers absolute mobility to its technical manpower. In Kenya, the system is more flexibile to school leavers with higher academic qualifications but

restrictive to those whose only criteria for advancement through further training would be the initial training undertaken and formal qualifications achieved. The system of Korea however, affords more flexibility to those with initial vocational or technical training and qualifications, than those without.

Further, while the Korean structure allows for each category of its technical manpower to climb to the highest level through distinct routes, that of Kenya largely restricts artisans and craftsmen to one avenue for their vertical mobility.

The Republic of Korea has achieved a highly centralized system of examination and certification of its technical manpower at all levels. Kenya is moving towards that goal. This tendency of centralization, despite its other disadvantages, has a positive contribution to career mobility of technical manpower, since the standards of training attained and the certificates issued would be nationally recognized. A further advantage is the harmonization of curricula and co-ordination of programme linkages between levels and institutions.

One of the persistent challenges to the development of technical education and training in all the

three countries is related to the negative societal attitudes towards technical careers. Korea's innovative approaches towards tackling this problem, through system of incentives, offers a good lesson for Kenya. We shall discuss in the next chapter.

Both countries (Kenya and the Republic of Korea) seem to be pursuing the policy of cost-sharing as a strategy for financing technical education and training. This policy requires that a greater part of the cost for education and training offered at any level be met by the beneficiaries themselves.

Finally, it is evident that all the three countries: Kenya, the Republic of Korea and Nigeria, have used legislation as a means of enhancing the development of their technical manpower. This is particularly reflected in the Acts of Parliament which let to the establishment of the Training Levy Fund Scheme in each country. The extent to which legislation has been used and its success, however, is expected to vary from one country to another. Notably, Kenya was the first country among the three to introduce the levy fund in 1970. This was followed by Korea in 1976 and finally Nigeria in 1978.

In the next chapter, we shall draw conclusions of the overall study and then give recommendations for policy reforms, geared towards the improvement of career mobility of technical manpower in Kenya.

FOOTNOTES

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CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 6

In this chapter, we shall outline the main conclusions of the overall study and then formulate recommendations for policy reforms in the Kenyan system of technical education and training. The recommendations suggested will be geared towards the improvement of career advancement of technical manpower in Kenya.

This study was designed to examine the influence of structure and policy of technical education and training to career advancement in Kenya. A further aim was to propose a structural model and some policy refinements for this country, Kenya, in the light of lessons learned from a comparative study of technical education and training in the Republic of Korea and Nigeria. Specific questions which the study was designed to answer were:

1. To what extent does the structure of technical education and training in Kenya promote or inhibit career advancement?

2. What are the policies of technical education and training in Kenya, and what are their specific influences to career advancement?

3. What influences have the following processes or practices had on career advancement in

technical education and training in Kenya: financing, recruitment, examination, certification and promotion?

4. What are the structures, policies and processes of financing, recruitment, examination, certification and promotion in Nigeria and the Republic of Korea? What are the major differences and similarities as compared with Kenya?

5. Is there any difference in the level of aspiration for further education and training between Artisans, Craftsmen and Technicians in Kenya?

6. What is the career opportunitity index (chances of admission to further education and training) of an Artisan, Craftsman and Technician in Kenya?

7. What structural and policy refinements in the Kenyan system of technical education and training would facilitate career advancement of technical graduates either within the formal school system or upon initial employment?

The study had the following overall limitations:

Only the formal or institutional aspects of technical education and training were considered. Thus the "JUA KALI" enterprises (mainly Open-Air Workshops and other establishments), which provide informal vocational training in various trades to some school leavers, were not examined.

While most data on Kenya drew mainly from primary sources, that on the Republic of Korea and Nigeria was mainly from secondary sources: Unesco, Wrold Bank, Commonwealth Secretariat and ILO publications. This problem was inevitable due to the limitation of time and money, which could not allow the researcher to travel to the reference countries or other important comparative documentation centres from which primary sources could be easily obtained.

Further, the survey on post-school technical and vocational training in Kenya, whose results have been discussed in chapter 3, had three limitations: only a small sample of technical institutions and trainees was considered; use of mainly descriptive statistics for the analysis and interpretation of data; and lack of comparison, in chapter 3, with Nigeria and the Republic of Korea, as the questionnaire could not be

administered in these reference countries largely due to the same reasons stated above.

Conclusions

On the basis of the survey, analysis of prevocational education and training, discussion of post-school technical education and training, and within the limitations of this study, the following overall conclusions may be drawn:

Career Opportunity Index

The relative career opportunity index for an artisan is zero, craftsman 0.02 and technician 0.79. The implication, based on this survey is clear: in Kenya, the chances that an individual entering the professional ladder at artisan level would rise or advance to Higher National Diploma (HND) level or beyond are virtually zero, those of a craftsman are relatively low, while those of a technician are quite high.

Level of Aspiration

The survey showed that 76% of artisans, 84% of craftsmen and 97% of technicians aspired to reach at least HND level of training, while 89% of HND trainees

aspired to attain at least a degree level of qualification. Thus the level of aspiration (highest qualification desired to be attained by an individual) is lower among artisans and craftsmen but higher among technicians and HND trainees.

However, over 95% of all categories of trainees (artisans, craftsmen, technicians and HND'S aspired for at least a higher level of technical training than the one they were undertaking. Hence, the apparent lack of career advancement among artisans and craftsmen, through further education and training, cannot be reasonably attributed to lack of aspiration.

Instead, the survey established that the major problems militating against the career advancement of individuals pursuing a technical career are financial, institutional, structural and to some extent motivational. Financial constraints include: relatively high tuition and boarding fees charged by technical training institutions, which makes it difficult for most self-sponsored trainees to meet the cost of their training. For instance, of the sample studied, 100% artisans, 74% craftsmen, 29% technicians and 44% HND's were self-sponsored. Futher, the Kenya government which has been investing considerable funds in technical education and training is now finding it increasingly difficult

to allocate any higher percentage of the national budget to this area, in the light of the prevailing economic conditions.

Institutional constraints include mainly lack of physical facilities, equipment and professionally trained technical teachers. Further, the current trend of recruiting trainees into different levels of technical training tends to favour pre-service students who have formal academic qualifications instead of in-service trainees who have completed vocational courses at lower levels. Motivational factors include low salaries as well as lack of guaranteed promotion upon completion of a higher level of training. Structural constraints are discussed at a later stage of this chapter.

Pre-vocational Education

The concept of pre-vocational education in the three countries may be classified as either preparatory or exploratory. Although each country may claim that its concept of pre-vocational education entails both the preparatory and exploratory dimensions, further analysis reveals that greater emphasis is put on one of the dimensions than the other.

At primary school level, Kenya's concept of pre-vocational education is both exploratory and preparatory, although greater emphasis is put on the latter. Thus pre-vocational education is exploratory to the minority of pupils who proceed to higher levels of formal education or training, but preparatory for the majority of whom either primary or secondary education is terminal and hence must join the labour market either as wage earners or self-employed people. However, pre-vocational education at primary and elementary school in Nigeria and the Republic of Korea respectively, is largely exploratory.

At the secondary school level, Kenya's concept of pre-vocational education remains largely preparatory, while that of Nigeria changes progressively from exploratory to preparatory at junior secondary and senior secondary levels. However, for the Republic of Korea, the concept remains exploratory at middle school and academic high school but becomes largely preparatory at vocational high schools.

Generally, where the expressed aim of pre-vocational education is to play an exploratory function or lay a foundation for further training, the students' career mobility is a policy inherent within such a concept. But where preparation for employment is the

main function of pre-vocational education, especially at primary school level, the students' prospects of career mobility may be largely curtailed.

The content of pre-vocational education offered at primary school level seems to have relatively little negative influence on career mobility among students who later pursue a technical career. This is largely due to the fact that a uniform curiculum is offered to all pupils at this level. However, at secondary school level, this influence becomes quite pronounced due to the introduction of tracks within the educational structure. Tracking may take three forms: a parallel system of General and Vocational High Schools as the case of Korea; provision of academic and vocational streams within the same school as is the case for Nigeria; and provision of post-primary vocational training parallel to the formal secondary school system, as is the case for both Kenya and Nigeria. Evidence from the Republic of Korea, however, suggests that as the country's level of industrial development rises and its economy grows favourably, the degree of tracking at lower levels of education declines.

The policy of making secondary schools comprehensive in Kenya and Nigeria, and thereby exposing all students to pre-vocational education, seems to have

achieved little in terms of attempts to channel bright students to technical careers. The lesson from Korea, which seems to have made some appreciable success in this area, suggests that structural changes must be accompanied by other incentives in areas such as examinations and certification, employment policies, recruitment into higher levels of training and work remunerations.

The major innovations in the examinations and certification at the primary level has been: introduction of Continuous Assessment in all the three countries as a way of measuring students' achievement; the elimination of formal selection examination for secondary school entry in Korea and Nigeria; and the introduction of Universal Primary Eduction in all the three countries. Rather than abolish the formal selection examination at the end of primary education, Kenya's strategy has been to delay it for one year, through introduction of the 8-4-4 system of education. The overall effect of these measures has been a higher opportunity index in terms of transition from primary or elementary school to junior secondary or middle school in Nigeria and the Republic of Korea respectively. However, in Kenya, it has only increased the duration of basic education but had no significant impact on the transition rate between the two levels of education.

Finally, the degree of vocationalization of primary or elementary and lower secondary or middle school is more pronounced in Kenya than it is in the Republic of Korea. Thus while Kenya puts a lot of emphasis on pre-vocational education, Korea's emphasis at lower levels, including middle school is on general education as a foundation for the further trainability of individuals.

Post-School Technical Training

A general trend observed in the three countries is the tendency to concentrate on technical training at post-secondary rather than post-primary school level. However, Kenya's current policy is to expand technical and vocational training opportunities at both post-primary and post-secondary levels. While a generally long period of general education is advocated by both Unesco and the World Bank as a foundation for further specialized technical training, evidence from the three countries shows that the level at which techncial training is concentrated is reflective of a nation's level of economic and hence educational development. For instance, where the majority of a nation's population have access only to primary education, then vocational training will be introduced from that level.

The degree to which the structure offers mobility to individuals pursuing technical careers vary between Kenya and Korea. Though both systems are characterized by some degree of flexibility, which is an asset to career mobility, their suitability to various categories of technical manpower or potential trainees varies. In Kenya, as we have already stated, the system tends to favour pre-service students who have higher formal academic qualifications rather than in-service trainees who have completed vocational courses at lower level. Thus while the post-school system is largely flexible to school leavers with higher academic qualifications, it is restrictive to those whose only criteria for advancement through further training would be the initial training undertaken and formal certification achieved.

The Korean structure, however, affords more flexibility to those with initial vocational or technical training and qualifications, than those without. The implication for Kenya is that, a review of the structure and recruitment policies is necessary so that career mobility of apprentices is improved. In particular, the Korean system which is characterized by a diversity of avenues of mobility for the different categories of technical manpower, can provide vital lessons for Kenya.

The Republic of Korea has a highly centralized system of examinations and certification of her technical manpower. Kenya is moving towards that goal through its policy of the harmonization and co-ordination of curricula, examination and certification.

Further, the long-term policy of financing technical education and training in all countries seems to be cost-sharing. Through this strategy the greater part of the cost for training offered at any level is expected to be met by the beneficiary. This is a single factor that is likely to be the greatest bottleneck to career mobility of individuals in the technical professions especially in Kenya. However, as we have seen, it seems to be an international trend that is strongly backed by the World Bank which is an International Donor Agency.

The issue therefore is not merely that of advocating for its abolition, as this is not likely to happen, but devising innovative strategies of how such individuals may raise the funds for meeting the cost of their training.

It is evident that legislation has extensively been used and is likely to continue being used as a policy of enhancing technical education and training,

and hence the development of technical manpower, especially within industry. The introduction of the Training Levy Fund Scheme, through various Acts of Parliament, in all the three countries is reflective of this policy.

This study shows qualitatively that there is a relationship between structure, policy and career advancement of the technical manpower. Thus in order to enhance career mobility, a flexible structure which provides various alternative routes for vertical mobility as well as clear linkages between levels of training and institutions, should be backed up by well formulated policies. Areas of priority that need well defined policies are: the cost and financing of technical training; the recruitment of trainees into various levels of training; the modes of examinations and certification; and the structure of incentives to technical graduates.

Clearly, policies which advocate career advancement of individuals in a technical career, unless supported by a well articulated structure will remain largely ineffective, and vice versa.

Recommendations

As the purpose of comparative education is to learn from the experience of other countries, a few recommendations may be usefully made for structural and policy reforms geared towards the improvement of career advancement, especially through further education and training, for Kenya's technical manpower.

Apprenticeship Training

The importance of in-plant apprenticeship system as an alternative strategy of supplying the much needed technical manpower is likely to be more pronounced as Kenya's level of industrial and technological development rises. But it will continue to play a complementary rather than substitutory role to the pre-service institutionalized training. For this to be effected, some policy reforms, especially related to the functioning of the Directorate of Industrial Training will be necessary. To this extent, I would recommend the following policy reforms:

Firstly, further legislation requiring the mandatory sponsorship of employees by employers for further training should be drafted. Hitherto, employers have only been required by law to

contribute to the levy fund, but as various studies have shown, the majority have opted to pay the levy but not train the employees for whom the levy was meant.

Secondly, the D.I.T. should approve more technical institutions for the utilization of the levy fund. These could include Harambee Institutes of Technology and Technical Training Institutes, among others. Such a move would motivate more employers to utilize nearby centres for skill upgrading and complete further education and training on day-release basis. This would not be possible if utilization of the levy is restricted to a few Industrial Training Centres and the three National Polytechnics.

This recommendation is in line with the District Focus for Rural Development, an official government policy entailing decentralization of essential services. Further, this policy reform when implemented, will not only serve companies and enterprises that are in rural areas and which have no training schools of their own, but it will also motivate employees to take up further training opportunities without detachment from their families.

Thirdly, the guidance and counselling of industrial employees, especially in areas related to opportunities available for further training through D.I.T., should be incorporated as an additional task of DIT's Levy Inspectors.

Recruitment Policy

Kenya's effort of ensuring increased opportunities for school leavers, through pre-service training in formal technical institutions, has been largely successful. However, its efforts in enhancing career mobility of technical manpower who are already employed, has scored little success. In particular, the opportunity index of artisans and craftsmen remain quite low while their aspiration for further training is evidently high. Towards improving the career opportunity index of these categories of technical manpower in Kenya, I would recommend that the government should review the admission policies at every level of training, and in every institution including university, with a view to introducing the Quota system.

The quota system would ensure that a certain percentage of vacancies available is reserved for in-service trainees. This will not be an entirely new policy in Kenya. For instance, the District Quota system is

already being applied when recruiting pre-service trainees for various courses in post-school public institutions in Kenya, except the universities. Hence the only new idea will be the extension of this policy to take into account not only the trainees district of origin but also their category.

Examinations and Certification

The policy of co-ordination and harmonization of curriculum, examinations and certification, which was recommended by the Presidential Working Party on Education and Manpower Training for the Next Decade and Beyond, and subsequently adopted by the government through Sessional Paper No.6 of 1988, should continue being pursued. Thus I would advocate increased centralization as far as this aspect of technical education and training is concerned.

However, it is noticed that while the Kenya National Examinations Council will be charged with the responsibility of examination and certification of courses in all public formal technical training institutions: National Polytechnics; Harambee Institutes of Technology; Technical Training Institutes; and Youth Polytechnics, the Directorate of Industrial Training will continue taking up responsibility for the In-plant Apprenticeship

System.

Two major pitfalls may be identified in such a dual system. Firstly, the system will produce two types of the same category of technical manpower. A craftsman trained in HIT's, for instance, will follow a curriculum developed by Kenya Institute of Edcuation (K.I.E.) while that one trained through apprenticeship system at Industrial Training Centres will follow curriculum developed by DIT. Secondly, as a consequence of the above anomally, the issue of double standards may arise. Further, in the long run, while admitting trainees, National Polytechnics and similar institutions following curriculum developed by K.I.E. may prefer students who have followed such a curriculum rather than the other. This would be another bottleneck to career mobility.

I would therefore recommend that a single body be established to deal with all aspects of technical training in Kenya, such a body could also be charged with the responsibility of accreditation to remove the current situation in which separate bodies for Engineers and Technicians exist. Such bodies have helped to reinforce the attitude of degrading technicians within the society. The organizational framework of the Korean Vocational and Technical Management

Agency (KVOTMA) could provide some hints on how the proposed body in Kenya could be established.

Financing

In view of the rising cost of education and training, and the high rate of population growth in Kenya, cost-sharing is likely to be a long-term policy of financing education. However, cognisant of the fact that increasingly fewer people would likely afford to finance their training, I would recommend the establishment of Open Colleges and Universities of technology. These will not only increase the opportunity index of employed workers seeking further education and training but will also lower the cost of such training. The open universities and colleges in the Republic of Korea could provide models for Kenya..

In addition, the current policy of establishing production units in technical institutions should be encouraged. This could have two advantages: that of generating funds to subsidize the trainees' fees as well as providing opportunities for practical experience or some form of industrial attachment, which has been a factor making the National Polytechnics to insist on employer sponsorship as a pre-requisite for admission into training.

Structure

The overall structure of post-school technical education and training should be reviewed with a view to making the following reforms:

(i) create a more direct linkage between the National Polytechnics and the Universities, especially Moi University which is technologically oriented. This may be achieved by rationally recognizing the duration of time spent, as well as the knowledge and skills attained at the Polytechnics, as alternative university entry requirements.

(ii) increase the number of alternative routes for upward mobility among artisans and craftsmen. This could be achieved in two ways. Firstly, a link may be created providing for re-entry into the formal school system, by introducing evening classes in available centres or schools. This could allow employed workers who desire to further their education and training, to accumulate credits in certain subjects, which may then allow admission into traditional colleges or universities as well as open universities suggested above.

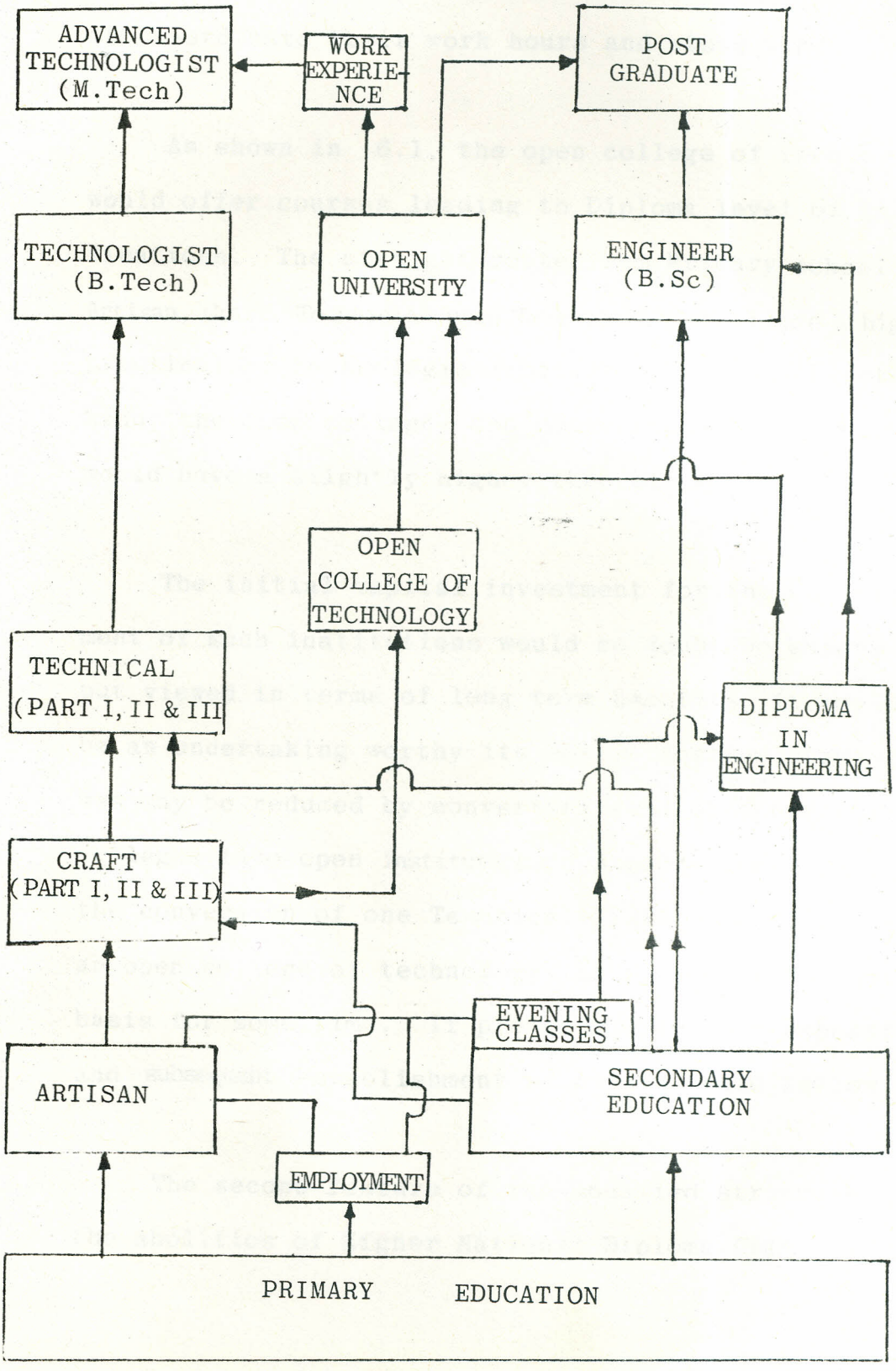
(iii) rationalize the duration of time spent at each subsequent level of training, by taking into consideration work already covered at lower levels, among various

> post-school training institutions below university level. This would ensure that the policy of giving credit for the knowledge and skills already covered at various levels of training is applicable not only between universities and National Polytechnics but among all technical training institutions. Such a strategy would further ensure that an in-service trainee with previous training at lower levels, takes a shorter period than a fresh high school entrant taking a similar course.

In the light of the above structural policy reforms suggested, I would recommend figure 6.1 as a structural model for the training of technical manpower in Kenya. Three main features may be identified in this modified structure.

The first feature is the introduction of an Open University and Open Colleges of Technology. These institutions would offer opportunities to industrial workers who, for some reasons, may not be able to pursue further education and training in conventional colleges or universities. Further, open colleges or universities would allow for greater flexibility in terms of admission requirements and programme organization. The flexible system so created would have two main advantages: the adoption of a non-grade system in which

6.1: SUGGESTED MODEL OF PROGRAMME LINKAGES AND THE OCCUPATIONAL HIERARCHY OF TECHNICAL MANPOWER IN KENYA



students may request for the number of credit hours of courses according to their circumstances; and the allowance for students to schedule their time so as to co-ordinate their work hours and study time.

As shown in 6.1, the open college of technology would offer courses leading to Diploma level of qualifications. The straight route from Primary school to Artisan, Craft, Technician upto Technologist would have a high practical or technological orientation. On the other hand, the open colleges and conventional college routes would have a slightly higher theoretical orientation.

The initial capital investment for the establishment of such institutions would no doubt be expensive, but viewed in terms of long term benefits, it would be an undertaking worthy its cost. Further, the expenses may be reduced by converting some of the existing colleges into open institutions. A good start would be the conversion of one Technical Training Institute into an open college of technology, to be operated on pilot basis for some time. If proved viable, its expansion and subsequent establishment of others would follow.

The second feature of the modified structure is the abolition of Higher National Diploma (HND) courses.

Prior to the introduction of Bachelor of Technology degree at Moi University, HND had been the highest level of training to be attained by technicians. Further, HND had sometimes been partially taken to be an equivalent of B.Sc. (engineering), although HND graduates are known to be less theoretically competent than engineers. The only route open to HND graduates for career advancement was enrolment in the university as B.Sc. engineering undergraduates. However, as we have already seen, their chances of advancement through this route were largely curtailed.

Further, despite the fact that one took three years of training at ordinary Diploma level and a subsequent two year-course to qualify at HND level, he is poorly rewarded, when compared with his counter-part who graduates from a university as an engineer. For instance, in the civil service while a university engineering graduate is employed at "Job Group K" whose starting salary is 4700/= per month, the HND graduate is employed at two grades lower: "Job Group H" whose starting salary is 3230/= per month. These are some of the factors that have been sources of frustration among HND graduates.

In figure 6.1, therefore, we have recommended that HND courses be abolished and technician courses

upgraded to allow technicians to move straight to Technical Universities. Generally, it would be cheaper to upgrade a technician's course by one year, for instance, than training him for two more extra years so as to qualify at HND level, and yet he will still be required to register for Bachelor of Technology Course at the university if he is to advance.

The third main feature of the proposed structure is an increase in the number of alternative routes for upward mobility among artisans and craftsmen, who as we have already seen, have hitherto had a very low career opportunity index.

Areas of Further Research

On the basis of issues raised but not adequately covered in this study, I would recommend that:

Further comparative studies be carried out on the non-formal aspect of technical education and training. In particular, the importance of the "JUA KALI" enterprises as an avenue of mobility through the informal apprenticeship programme could be investigated;

The specific influence of the Ministry of Labour on training for unemployment, as well as the

relationship, in the area of training or skills development, between the Ministry of Technical Training and Applied Technology and the Ministry of Labour be studied;

In view of the importance of teachers in technical training, further comparative research should be carried out in Technical Teacher Education. In particular, the recruitment, examination, certification, curricula and strategies for the retention of technical teachers should be examined; and

Since this study took into account only a limited sample of trainees when calculating the career opportunity index, further research that incorporates a larger sample could be done to verify the findings of this research.

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APPENDIX

QUESTIONNAIRE ADMINISTERED TO TRAINEES IN TECHNICAL TRAINING INSTITUTIONS IN KENYA

NAME _____

INSTITUTION _____

AGE _____ SEX _____

MARITAL STATUS _____
(state whether married or single)

1. What is the highest level of schooling you have reached (Tick the correct box).

☐ Primary

☐ Secondary 'KJSE' level

☐ Secondary 'O' level

☐ Secondary 'A' level

☐ University

2. Fill in the table below to show the examinations you have done, the results you obtained and the year in which that examination was done.

EXAMINATIONS DONE	SCHOOL ATTENDED (WRITE EITHER TECHNICAL OR GRAMMAR)	YEAR	RESULTS OBTAINED
C. P. E.			---- Points
K.C.P.E.			---- Points
K.J.S.E.			No.of Subjects passed
E.A.C.E. or K.C.E.E.			DIVISION___ POINTS ____
E.A.A.C.E. or K.A.C.E.			SUBJECT GRADE 1._____ _____ 2._____ _____ 3._____ _____ 4._____ _____
UNIVERSITY			(Degree Obtained)

3. Name the course you are taking in this institution.

_____

_____

4. Are you a PRE-SERVICE or IN-SERVICE student?

_____

5. If you are an IN-SERVICE student, state the other courses which you have previously done and successfully completed. Please indicate the institution(s) and the year the course was done. (This question to be answered by in-service students only).

NAME OF COURSES	INSTITUTION WHERE IT WAS DONE	YEAR

6. Who is paying for your studies in this institution? (Tick correct box).

☐ Company sponsored

☐ Government sponsored

☐ Self-sponsored

☐ Other (specify) _____

_____

7. How many times did you try applying for this course before finally being admitted? (Tick correct box).

☐ First attempt

☐ Second attempt

☐ Third attempt

☐ Other

8. From what source did you learn that the course you are now taking existed before applying for it? (e.g. Parents, Newspapers, Teachers, etc). Explain.

_____

_____

_____

9.(a) If you had choice, would you have preferred a different career to the one you are now taking? (Tick correct box).

☐ Yes

☐ No

(b) If YES state which career you would have taken instead. _____

_____

10. Do you intend to continue with any further education and training beyond this level? (Tick correct box).

☐ Yes

☐ No

11. Give reasons for your answer in Q10 above.

_____

_____

_____

_____

12. Which of the following qualifications do you aim to achieve in your career-lifetime, i.e. the one with which you will be satisfied and so have no need for further education and training? (Tick correct box).

- ☐ Artisan
- ☐ Craftsman
- ☐ Technician
- ☐ Higher Diploma
- ☐ Degree

13. From your own experience and that of others, which of the qualifications listed in Q12 above do you REALLY THINK will be the highest qualification you will reach?

_____

_____

14. Which of the following factors do you think is most likely to prevent you from achieving your aim? (Tick correct box).

- ☐ Family commitments or responsibilities
- ☐ Lack of means to pay for my studies
- ☐ There is no immediate benefit, e.g. increased salary or promotion after completion of course.
- ☐ Lack of enough places in training institutions.

☐ Other reason(s) Explain.

_____

_____

_____

15. It is generally said that people who take a technical career have very low chances of advancing to higher levels especially through further education and training. Do you. (Tick correct box)

☐ Strongly Agree

☐ Agree

☐ Disagree

☐ Strongly Disagree

16. Briefly state how you expect the present course to benefit you after completing it.

_____

_____

_____

17. State clearly the factors you think prevent people pursuing a technical career from advancing or obtaining further education and training. List them beginning with the most important factor.

_____

_____

_____

_____

18. Use the space below to write any comment you feel will improve the further training of people pursuing a technical career.