

**HIGHER EDUCATION AND HUMAN RESOURCE DEVELOPMENT
IN KENYA: THE CASE OF TECHNICAL TRAINING
IN PUBLIC UNIVERSITIES**

BY

ASINGO PATRICK ODHIAMBO

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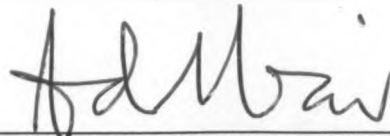
DECLARATION

This Thesis is my original work and has not been submitted for a degree in any other university.



**ASINGO PATRICK ODHIAMBO
(CANDIDATE)**

This Thesis has been submitted for examination with my approval as University Supervisor.



**DR. C. ODHIAMBO – MBAI
(SUPERVISOR)**

DEDICATION

This Thesis is dedicated to my beloved parents, Wilfred Asingo Ogam and Jenipher Anyango Asingo.

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In the process of preparing this thesis, I benefited immensely from the support and assistance received from a number of individuals and institutions. To begin with, I am extremely grateful to the University of Nairobi for granting me the scholarship which enabled me to undertake this study. I am equally grateful to the staff of the Ministry of Education and Human Resource Development, the Ministry of Research and Technical Training, the Ministry of Health and the Kenya Institute of Education (K.I.E.) for granting me access to their very resourceful libraries.

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However, the assistance and support given notwithstanding, I personally take responsibility for any error of omission or commission.

ABSTRACT

This study set out to establish the factors which inhibit effective development of the higher cadre human resources in Kenya, with specific reference to the university technical graduates. The ultimate goal in this regard was to provide policy recommendations towards qualitative improvement of the higher cadre technical manpower in Kenya. The study modified and adopted the Eastonian version of the systems theory, and was guided by the broad hypothesis that the nature of training provided by the Kenyan public universities does not adequately prepare the higher cadre technical manpower for their roles in the society as technologists. In terms of methodology, the study utilised both primary and secondary data. Secondary data was obtained mainly from books, journals, magazines and relevant government policy documents. Primary data was generated through interviews with university students, lecturers, as well as the employed graduates and their employers. The respondents were identified through a combination of stratified, multi-stage and snowball sampling techniques. The data so obtained was analysed using descriptive methods.

The study found out that despite the efforts made by the government to promote technical training over the years, the quality of the higher cadre technical manpower has remained considerably low. A number of factors were found to bedevil the search for quality technical graduates. These include the inefficient university curriculum development and review strategy, the inapt teaching of technical courses in public universities, poor co-ordination of industrial attachments for university students, maladministration of university examinations, and the weak link between public universities and the employing institutions in Kenya.

Consequently, the study made several recommendations aimed at boosting the quality of the technical graduates. First, public universities should adopt a more efficient curriculum development and review strategy which not only encourage frequent reviews, but also

incorporate all the major stake-holders in the human resource development process, especially the employers. Second, the universities should design more practical oriented technical courses since the current ones are a bit too theoretical. Third, industrial attachments for university students should be properly co-ordinated and tied to the degree award so that no student can graduate without undertaking an attachment. Fourth, university technical departments should be encouraged to administer practical examinations as part of the end of semester or year examinations, and should strive to wipe out traces of examination irregularities. Fifth, deliberate measures should be taken to strengthen the link between public universities and the employing institutions. Finally, secondary school education should be elongated by re-introducing the two year advanced level secondary education in order to prepare students adequately for university education.

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ABBREVIATIONS

AHITI	Animal Health and Industry Training Institute
AIM	African Inland Mission
CEC	Commonwealth Education Conference
CEE	Common Entrance Examination
CIDA	Canadian International Development Agency
CMS	Church Missionary Society
CPE	Certificate of Primary Education
CSE	Cambridge School Certificate
CSM	Church of Scotland Mission
DC	District Commissioner
DEB	District Education Board
EAEC	East Africa Examinations Council
FAM	Friends African Mission
GAS	Government African Schools
GCE	General Certificate of Education
GCSE	General Certificate of Secondary Education
GNM	German Neukirchen Mission
HGF	Holy Ghost Fathers
HIT	Harambee Institute of Technology
ILO	International Labour Organisation
KACE	Kenya Advanced Certificate of Education
KAPE	Kenya African Preliminary Education
KASE	Kenya African Secondary Examinations

KCE	Kenya Certification of Education
KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
KIE	Kenya Institute of Education
KMTC	Kenya Medical Training College
LNC	Local Native Council
MHM	Mill Hill Mission
MTD	Medical Training Depot
NDP	National Development Plan
NGO	Non Governmental Organisation
NITD	Native Industrial Training Depot
OSSREA	Organisation of Social Science Research in Eastern Africa
PSE	Primary School Examination
RHDC	Rural Health Demonstration Centre
RHTC	Rural Health Training Centre
RIAT	Ramogi Institute of Advanced Technology
RTC	Royal Technical College of East Africa
SAC	School Area Committee
SDA	Seventh Day Adventists
TVE	Technical and Vocational Education
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USAID	United States Agency for International Development
USA	United States of America
WECO	Western College of Arts and Applied Science

CHAPTER ONE

INTRODUCTION

1.1 STATEMENT OF THE PROBLEM

The commitment and determination of the Kenya government to provide education as a means of developing human resources cannot be gainsaid. Indeed, over the years, the government has made several policy pronouncements and institutional changes aimed at improving the quality of the products of the education system. One aspect of formal education, which has received considerable attention since independence, is technical education. The government has continuously reiterated that one of the goals of technical training is to produce a class of technical manpower with the knowledge, skills, attitudes and technical know-how corresponding to the needs of the economy. The public universities are particularly expected to take a lead in this endeavour by producing high calibre technical graduates. As a means of achieving this goal, the university technical departments and faculties, like the middle level technical institutions, are required to lay more emphasis on practical aspects of training, enforce compulsory industrial attachment and ensure continuous assessment of the students' learning progress.

However, despite all these efforts, the quality of the human resources in the technical fields, including university technical graduates, has remained considerably low. The 1997 – 2001 development plan for example has observed that technical graduates are generally inflexible, lack hands-on experience and have poor work attitude. The dissatisfaction with the quality of the university technical graduates is further reflected in the emerging trend among some employers to seek to retrain their prospective technical graduate employees before deployment, despite the fact

that their university training has presumably loaded them with the necessary knowledge, skills and attitudes which measure upto the job requirements in their professions. This trend seems to be motivated by the feeling that there exists a gap between the knowledge and skills acquired by the students through the university education and those skills required in the work stations. In fact, it is this gap which both the pre-service and on-the job training programmes hope to fill.

The most pertinent question which arise from the foregoing, and which this research endeavour undertook to address is: - **What accounts for the generally low quality of the technical graduates from the Kenyan public universities?**

In response to this question the study examined a number of factors in order to determine their influence on the quality and performance of the university technical graduates. These include the university curriculum development and review strategy; the teaching of technical courses in public universities; the co-ordination of industrial attachments for university students; the administration of university examinations; and the link between public universities and the employing institutions.

These factors boil down into the sub-questions which guided this research in the search for a solution to the main question raised above. First, how efficient is the university curriculum development and review strategy, and what is its influence on the quality of technical graduates? Second, how adequate is the level of practical skills emphasised by the university technical departments and faculties, and how does this level affect the quality of the resultant graduates? Third, how efficient are the industrial attachment arrangements for the university students, and what is its impact on the quality of the graduates? Fourth, how effective is the university examination system as a means of determining successful internalisation of the inputs acquired through training? Finally, how strong is the link between public universities and the employing institutions, and what is the effect of this link on the quality of technical graduates?

1.2 THE STUDY OBJECTIVES

Broadly stated, this study set out to identify the bottlenecks to effective development of the higher cadre technical manpower, especially the university technical graduates, and suggest remedial measures which will ameliorate the quality of the technical graduates.

More specifically, the objectives of this research are:-

- i) To determine the efficiency of the university curriculum development and review strategy, and its influence on the quality of the technical graduates;
- ii) To establish the level of practical skills emphasised by the university technical departments and faculties, and its effect on the quality of the resultant graduates;
- iii) To examine the efficiency of the industrial attachment arrangements for university students, and its impact on the quality of the graduates;
- iv) To evaluate the efficiency and effectiveness of the university examination system as an instrument for measuring satisfactory internalization of inputs acquired through university education;
- v) To explore the strength of the link between public universities and the employing institutions, and its implications for the quality of the technical graduates; and
- vi) To come up with recommendations on how to improve the quality of the university graduates so as to enable them meet the needs of the job market.

1.3 JUSTIFICATION OF THE STUDY

This study is a response to the general neglect of the human resource factor in national development, especially in the Third World. The study has enabled us to identify the weaknesses in the development of the higher cadre technical personnel, especially the university technical graduates. Using the problems identified as guides, the study has made policy recommendations aimed at improving the quality of the higher cadre technical manpower in Kenya. This way, the study provides alternative guide to policy makers on how to improve on the quality of human resources in Kenya.

In terms of building knowledge, the study is vital as a comprehensive synthesis of the abundant and diverse jungle of literature on human resource development. The study bridges the gap created by the tendency of most of the literature in the field of human resources to neglect qualitative aspects of human resource development. The study has also examined in details some of the issues scantily presented in the available literature in order to clarify them, while at the same time determining their utility in explaining the underdeveloped nature of human resources in Kenya. In short, the rationale for this study rests on the fact that it increases our knowledge and provides a policy input on the subject of human resource development.

1.4 LITERATURE REVIEW

The literature in the field of human resource development is both abundant and varied. Most scholars writing in this area are agreed that human resources play a pivotal role in national development. In this regard, Shaath (1975) argues that the rate of social and economic growth depends largely on the quality of a country's human resources. He views human resource development as a necessary first step in the socio-economic transformation of any society, where

human resource development is defined as “the process of increasing the knowledge, the skills and the capabilities of all the people in a society and the accumulation of human capital and its effective investment in the development of economy “(**Harbison 1964,2**).

In an article, “Education, Economic policy and the National Budget”, Adebayo Adedeji (1977) argues that a country’s development does not depend solely on national resource endowments and the availability of capital resources, but also on the availability of educated and skilled manpower. He maintains that “no amount of capital investment uncomplemented by the human factor can sustain or enhance the development of any society” (**CEC Report 1977,44**). This is more so because “human beings constitute the creative genius and impetus for development. They are the principal agents of change and the central pillars of the economy. While people are the ultimate beneficiaries of economic and social development, they are also the most vital input in the productive, distributive and exchange processes of the economy” (**1989 – 1993 NDP,193**).

According to Shaath (1975), the process of human resource development requires huge financial resource base which the developing countries lack. He advocates for the infusion of foreign aid from the advanced nations to help in the process of human resource development, noting that “without substantial aid from the advanced countries and the international organisations in the form of men, money, overseas training places, educational materials and expert advise, Africa’s manpower shortages will not be relieved in the foreseeable future” (**Rweyemamu & Hyden 1975,101**).

Shaath (1975) contends that it is economically more expedient for the developing countries to send students abroad to acquire necessary skills than to try to develop and expand local capacity to handle demand for trained manpower in the higher technical skill areas. This view is shared by Arthur Lewis who, writing in the mid 1960s, observes that “most of the new

African countries do not at present have enough students to justify building a university: it is cheaper for them to send their students abroad”(Cowan 1965,207).

Kariuki (1975) views the formal education system as providing supportive background for the development of human resources, which is eventually accomplished through training. Formal education has been defined as “the hierarchically-structured and chronologically graded ‘modern education system’ that stretches from primary school through the university”(Ahmed & Coombs 1975,xxviii). To distinguish training from formal education. Kariuki defines training as “the organised process by which people learn knowledge and skills required to fill the gap between their initial knowledge and skills and those required for the effective performance of the job they are expected to do after training”(Rweyemamu & Hyden 1975,111). He notes that to lighten the task of training, formal education must equip its beneficiaries with skills which are as familiar as possible to those required by the job, otherwise, if the gap is too wide then it might never be closed even through training.

Makalu (1971) argues that most countries of the Third World have failed to strike a balance between manpower demand and supply, noting that, “one of the many contradictions of the African (manpower) situation is the persistent existence of unemployment while some industries are desperately short of labour” (Makalu 1971,94).

Falayan Ojo, in an article, “Manpower Development in West African” (1986), note that there is a shortage of skilled manpower co-existing with surplus unskilled manpower, leading to labour under-utilisation and a high level of expatriate employment. He observes for example that in Liberia between 1972-73, the level of expatriate employment was as high as 67% in the service sector, while in Gambia in 1975, 85% of Doctors and 53% of Engineers were expatriates. He attributes the shortage of skilled manpower especially in the higher technical grades of Architects, Quantity Surveyors and Engineers to the slow growth in the output of the institutions

responsible. Bramham (1978) however attributes manpower shortages in developing countries to the unwillingness of potential employees to undertake certain occupations.

Arthur Lewis (1965) argues that the oversupply of educated persons is a familiar feature, almost a definitive characteristic of the developing countries. In other words, the education systems of most developing countries produce more educated people than their economies can absorb. Lewis gives the example the oversupply of university graduates in India in the 1930s and the oversupply of primary school leavers in some West African countries in the early 1960s.

The 1971 Commonwealth Education Conference Report notes that some countries of the Commonwealth have overemphasised higher level education even where there was a more urgent need for middle level training. As a result, such countries have produced too many highly qualified personnel and too few people with appropriate training for the middle and lower level positions in industry and commerce. The Report further observes that many of the Commonwealth countries experience an acute shortage of trained technicians since many young people in those countries regard all forms of technical training as manual work.

Josefina R. Cortes (1973) observes that the Philippines produces a surplus trained manpower which co-exists with a high level manpower emigrations to the U.S. and Canada. The irony is that the brain drain affects mostly those areas with the smallest proportion of college graduates. Thus, the brain drain in the Philippines is not an outflow of surplus trained manpower but a loss of valuable human resources which are in short supply and yet critical for national development. In 1970 for example, 87.6% of the emigrant manpower from Philippines to the U.S. and 95.2% of the emigrant manpower to Canada were from high demand occupations in Philippines.

Adebayo Adedeji (1977) revisits the question of "brain drain", viewing it as some form of international transfer of resources in the form of human capital. He argues that since this transfer

of human capital is never recorded in any official balance of payments statistics, it is a potential factor causing shortage of skilled manpower in many developing countries. He is however sceptical about the ability of the developing countries to solve the problem of "brain drain", given its pecuniary causes.

It has been argued that the educational institutions of developing countries have failed to provide the kind of education needed for their changing economies. Karka Gurung argues that "the increase in the number of the educated unemployed alongside with shortages of trained personnel has become a standard pattern in most of the developing countries... This adverse situation is very much the making of maladjustment between the education system and the socio-economic needs of the developing countries" (**Journal of the Near East and South Asia vol.1.,3**). Albert Tevoedjre adds that "Africa is saddled today with a growing number of young persons turned out by primary and secondary schools who have none of the skills required by industry and who therefore remain not only unemployed but unemployable" (**International Labour Review 1969,69**).

Locken (1969) attribute this mismatch between education and the economy to the fact that policy makers in many developing countries have been preoccupied with issues of international acceptance and standards at the expense of local needs and requirements. He argues that "education systems must be geared to the needs of each country and respond to those needs as each country develops and matures. Certainly, the education system must be aware of and respond to the changing patterns of needs, and desires of all Africa, and of the world at large, but its primary responsibility is to meet the needs of each country" (**Locken 1969,126**).

✓ Rony Diaz (1973) argues that the mediocre outcome of development plans in most developing countries is due to their failure to include human resource development as integral parts of their general economic development plans. The burden of developing human resource

needs of the economy has been left to the schools, which pursue their training activities independently without gearing their curricula to the specific training needs of the economy. In fact, there is lack of information on the specific quantity and quality of human resources needed by the employers, both in the private and public sector. The foregoing seems to reinforce the argument that "one of the most critical problems facing developing countries is how to model their educational and training institutions to keep pace with their economic development and to produce an effective reservoir of manpower with all the diverse skills necessary for modernisation" (Technos 1977, 23).

✓ Adebayo Adedeji (1977) argues that given the paradoxical co-existence of a shortage of critically needed skilled manpower and a surplus unskilled labour, the developing countries should design a human resource development strategy that aim at the production of those critically needed skills. For him, an appropriate human resource development strategy is one which ties the education system to the current and future manpower requirements of the economy.

In an article, "The Role of Examinations on the promotion of the paper Qualification Syndrome", Angela Little (1982) argues that examinations and qualifications provide the main link between modern sector labour market and the education system. The examination system considerably affects the quality of skill formation encouraged by the education system, which in turn influence manpower inputs to the labour market.

Some scholars tend to cast aspersions on the ability of examinations to measure the levels of competence required in the job market. ILO (1982) expresses the feeling that paper qualifications attained by virtue of having passed examination, have assumed undue importance. The employers use paper qualifications rather than productivity to determine salary structures, and sometimes use it for other purposes rather than measuring competence such as raising

education qualifications to reduce the number of applicants. In this regard, paper qualifications appear to be an end in itself as employers demand it without carefully examining its content or implications for the job to be undertaken. Consequently, "the pursuit of a degree, diploma or certificate has been the "end-all" for most African students for generations" (McNown 1970,78).

✓ The importance of education in the process of human resource development notwithstanding, it has been observed that education is not the only component which enhances the productive capacity of human capital. According to Kariuki (1975), good performance in the examinations may not guarantee good performance in the work place where other factors such as working conditions and motivation may influence performance.

✓ Locken (1969) contends that although formal education and training are vital in preparing employees for jobs, other factors such as human relations on the job, wages and working conditions, selection and placement methods, health and motivation are equally important in human resource performance. He notes that these other factors have received very little attention and where they have been attended to, a resultant increase in the performance of manpower has been observed. He adds that "there is little doubt that a portion of trained manpower available in African countries is wasted through poor selection and placement techniques... family, tribal and personal connections continue to be the dominant factors in the selection of individuals for specific jobs. The higher the job level, the more predominant the nepotism factors" (Locken 1969,109).

Adebayo Adedeji (1977) attempts to establish a correlation between increased expenditure on education and the level of economic growth. He observes that correlational analysis has shown that increased expenditure on education has been accompanied by substantial economic growth. That is, those countries experiencing the fastest rates of economic growth are usually those which have allocated the largest absolute and relative shares of their national

budgets to education. Conversely, those countries which are falling behind in the economic race are mostly those which are allocating the smallest absolute and relative proportions of their budgets to education. He is however not sure whether it is increased expenditure on education that stimulates economic growth or it is the latter which determines the former. It is possible that countries allocating large proportions of their national budgets to education are doing so, or are able to do so, because of greater economic prosperity and vice versa.

✓ Makalu (1971) talks of “educated manpower” which he defines as men and women who have been specifically trained in the various professions such as doctors, lawyers, architects, dentists, geologists, agricultural scientists and engineers. He argues that the main source of the “educated manpower” are the universities, the institutes of technology and the specialist professional institutions. For him, such institutions of higher learning should be controlled by the state so that their activities can be harmonised with the National Development Plan in order to produce men and women who will increase the effectiveness of the plan and contribute to the achievement of national goals.

The available literature also underscores the importance of providing high quality education at the lower levels of the educational ladder as a means of strengthening the higher level institutions. Indeed “it is indisputable that well-provisioned, high quality basic education can strengthen the process and output of educational systems at the higher levels of education” (OSSREA 1992,63). This means that if the quality of education provided at the lower levels of the educational ladder is low, then that of the higher levels will be equally low. McNown (1970) uses this argument to account for the low quality of science graduates from African Universities, noting that “the secondary schools in Africa are not yet adequately equipped to cope with advanced level courses in science... The schools in general are not yet in a position to feed the university with the right type of science students” (McNown 1970, 90).

The literature reviewed provide a good recipe for further research of the type that we undertook. The review reveals that most of the studies on human resource development have tended to focus more on quantitative aspects of manpower shortages, either addressing the causes as shown by Falayan Ojo, Bramham (1978), Karka Gurung and Josefina R. Cortes, or suggesting solutions to manpower shortages as done by Shaath. In short, the studies focus mainly on the quantity of human resources in relation to the job market. Our study however, focused on the quality of human resources measured in terms of skill endowment that corresponds to labour market demands. Our contention is that the inputs in the supply side of the human resource development equation do not match with the output required in the demand side of the same equation.

The foregoing should not be misconstrued to mean that there is no data at all on the qualitative aspects of human resource development, only that studies on the qualitative development of human resources do not seem to have been conclusively carried out. The theme of mismatch between human resource quality and labour market demands, which is the focus of this study, has received scant attention in the available literature. Whereas we concur with Angela Little's contention that the examination system considerably affects the quality of skill formation, we feel such a contention is incomplete without invoking the students' psychology with regard to examinations and skill formation. The immediate concern of most students is how to pass their examinations and get absorbed in the job-market. Students lay more emphasis on those skills which enable them pass their examinations, rather than the skills required in the job-market. This means that where the examination system tends to place more emphasis on certain kinds of skill formation, say, memory and descriptive powers, students will lay equally more emphasis on the same, at the expense of practical and analytical skills required in the job-market. The result will be what Angela Little calls "paper qualification syndrome" – a feeling of

qualification for a given job, by virtue of having passed some examination, while in essence lacking the quality of skill formation necessary for the job. This calls for a study of the influence of the examination system on the quality of human resources, that puts into consideration the question of student psychology with respect to examination and skill formation. Our contention is that students psychology plays a great role in determining the influence of the examination system on the quality of human resources.

ILO (1982) questions the validity of examination as a measure of qualification, viewing it as something whose value has been blown out of proportion. It is our view that the examination still remains the most efficient measure of successful internalization of the knowledge, skills and values acquired through education, so long as it is well managed. This leads us to consider the impact of the poor management of examinations, reflected in the examination irregularities, on the quality of human resources.

✓ From the jungle of literature on human resources, we pursue the argument by Karka Gurung that there is a maladjustment between the education system and the socio-economic needs of the developing countries, which has resulted into a mismatch between the skills acquired through the education system and those required by the economy. However, while Gurung uses this argument to justify the persistent increase in the number of the educated unemployed alongside with shortages of trained personnel, which is essentially a quantitative aspect of the human resources, we adopted the argument as a means of explaining the quality of human resources. Similarly, we adopted the argument by Albert Tevoedjre that the training institutions in Africa produce young boys and girls without the skills required by the employing institutions. However, whereas Tevoedjre is mainly concerned with the primary and secondary schools, we extend this argument to the universities as well. Like Locken, we contend that the education

system must be geared primarily to the needs of each country and respond promptly to changes in those needs.

In short, the literature reviewed provides a basis for this research in at least three significant ways. First, most of the literature concentrates on the quantitative aspects of human resources, while we have remained focused on the qualitative aspects. Second, the scant literature on qualitative aspects of human resources dates many years back and hence our study becomes a useful test on their tenability in the light of the changes which may have occurred. Finally, the issues emanating from the reviewed literature related to the quality of the human resources were introduced in studies which were not Kenya-focused and hence our decision to determine their utility in explaining human resource development in Kenya.

1.5 THEORETICAL FRAMEWORK

There exist several theoretical perspectives purporting to explain the phenomena of underdevelopment in the Third world. First in line, is the modernisation theory which emerged after the second world war to explain the relatively underdeveloped status of the new nations emerging from the ruins of colonialism. It was articulated by scholars such as W.W. Rostow, Gabriel Almond, David Apter and Lucian Pye. Modernisation theory begins by drawing a dichotomy between two distinct and mutually exclusive societies, one of which is "traditional" (underdeveloped, primitive and rural) while the other is "Modern" (developed, urban and industrial). All societies are then supposed to fall into either of these groups. The "Traditional" and the "Modern" societies are viewed as being historically connected by means of a continuous evolutionary process that follows a certain order. In other words, all societies evolve through the same historical course, and hence the underdeveloped societies are expected to follow the same

development path charted out for them by their developed counterparts. The main concern of modernisation theorists is to identify the historical factors and institutional variables whose change was crucial for the advancement of the so called "Modern" societies, with a view to grafting these institutions and their attendant values onto the developing countries. Modernisation therefore led to an incisive flow of capital and technology from the Developed countries to the Third world.

Modernisation theory has received its fair share of criticisms. First, it ignores the contributions of external factors to the underdeveloped status of the Third World countries. Second, the theory is heavily Eurocentric, drawing its strength from European experiences and hoping that all societies must follow the same development path followed by the developed nations. This Eurocentric tone is evident in the works of scholars such as Shils (1962) who argues that, "these states of Western Europe, North America... need not aspire for modernity. They are modern. It has become part of their nature to be modern and indeed what they are is definitive of modernity. The image of these societies provides the standard and models in the light of which new states seek to reshape themselves" (Shils 1962,10). Third, the theory seems to confuse development with westernization. Fourth, the theory rests on false assumptions that all societies must follow the same development path, and that no intermediate society exist between what they call "Modern" and "Traditional" societies. Fifth, while addressing internal causes of under-development, it tends to neglect the vital role of human resources in national development. Finally, what makes the theory even weaker is the fact that its proponents are not agreed amongst themselves as to what constitute "Modernity". With these serious limitations, the theory cannot be used to explain the development of human resources in Kenya.

Dependency theory emerged out of the realisation of the inadequacies inherent in modernisation theory. It was developed mainly by Latin American scholars such as Osvaldo

Sunkel, Fernando Henrique Cardoso, Raul Prebisch and Bacha Savit Claire. Dependency theory explains underdevelopment of the Third World in terms of their relationship with the developed countries. Through contact with the developed countries, effected by means of colonialism and trade, the third World countries were drafted into the world capitalist system as junior partners specialising in the production of raw materials and the primary commodities which they exchange at an unfavourable rate with the manufactured and capital goods from the developed countries.

The dependency theory stands accused of neglecting internal factors such as corruption, mismanagement and undeveloped human resources. It also rests on a faulty assumption that the developed countries have always been developed and that the underdeveloped societies will always remain so until they cut their links with the developed world. The theory therefore can not be used to adequately explain the phenomena of human resource development in Kenya.

This study adopts the systems theory as its theoretical framework. The systems theory can be traced to the works of a German Biological Scientist, Ludwig van Bertalanffy who, in 1968 formulated the general systems theory. According to this theory, the society is viewed as an open system, which continuously interacts with its surrounding thereby influencing it, and being influenced by it. David Easton undertook the task of applying the General systems Theory to the analysis of political phenomena and in so doing developed the systems theory. He argued that there was need to focus on the whole system rather than on its parts alone, to be aware of the environmental influence upon the systems and to recognise political life in a state of equilibrium and disequilibrium. Easton separated political life, which forms the political system, from the rest of the society, which he called the environment. He then examined the relationship between the political system and its environment. He looked at the political system as an open system

which obtains inputs from its environment in the form of support and demands, and processes them into outputs which it emits to the environment.

Although the Estonian model was used to explain the relationship between the political system and its environment, it can no doubt, be modified and used to explain the development of human resources in Kenya. Like the political system, the education system receive certain inputs from its environment in the form of support and demands. The support may come from individuals, organisations or institutions and may assume various shapes such as funding of research projects, budgetary allocations from the central government, donation of equipment and other teaching aids, as well as scholarships for further education and research. The environment also imposes demands on the education system such as the demand for certain levels of skill formation commensurate with the needs of the economy.

Using the support it acquires from its environment, together with its own in built mechanisms, the education system processes these demands into outputs in the form of human resources. Thus, in a state of equilibrium, the education system is constantly in interaction with its environment from which it derives its inputs in the form of support and demands, and to which it remits outputs in the form of human resources. The outputs (human resources), necessarily generates reactions from the environment (job market) to the education system, either in the form of support or more demands, depending on the nature of the human resources produced. These reactions are channelled to the education system through a feedback loop and are aggregated together with fresh support and demands from the environment into new inputs for the education system.

1.6 HYPOTHESES

1.6.1 GENERAL HYPOTHESIS

The nature of training provided by the Kenyan public universities does not adequately prepare the higher cadre technical manpower for their roles in the society as technologists.

1.6.2 OPERATIONAL HYPOTHESES

- (i) The more efficient the process of curriculum development and review, the higher the quality of the graduates;
- (ii) The greater the emphasis on practical skills, the higher the quality of the technical graduates;
- (iii) The more efficient the industrial attachment arrangements, the higher the quality of the technical graduates;
- (iv) The more efficient the examination system, the higher the quality of the graduates;
- (v) The stronger the link between the training institutions and the employing institutions the higher the quality of the graduates.

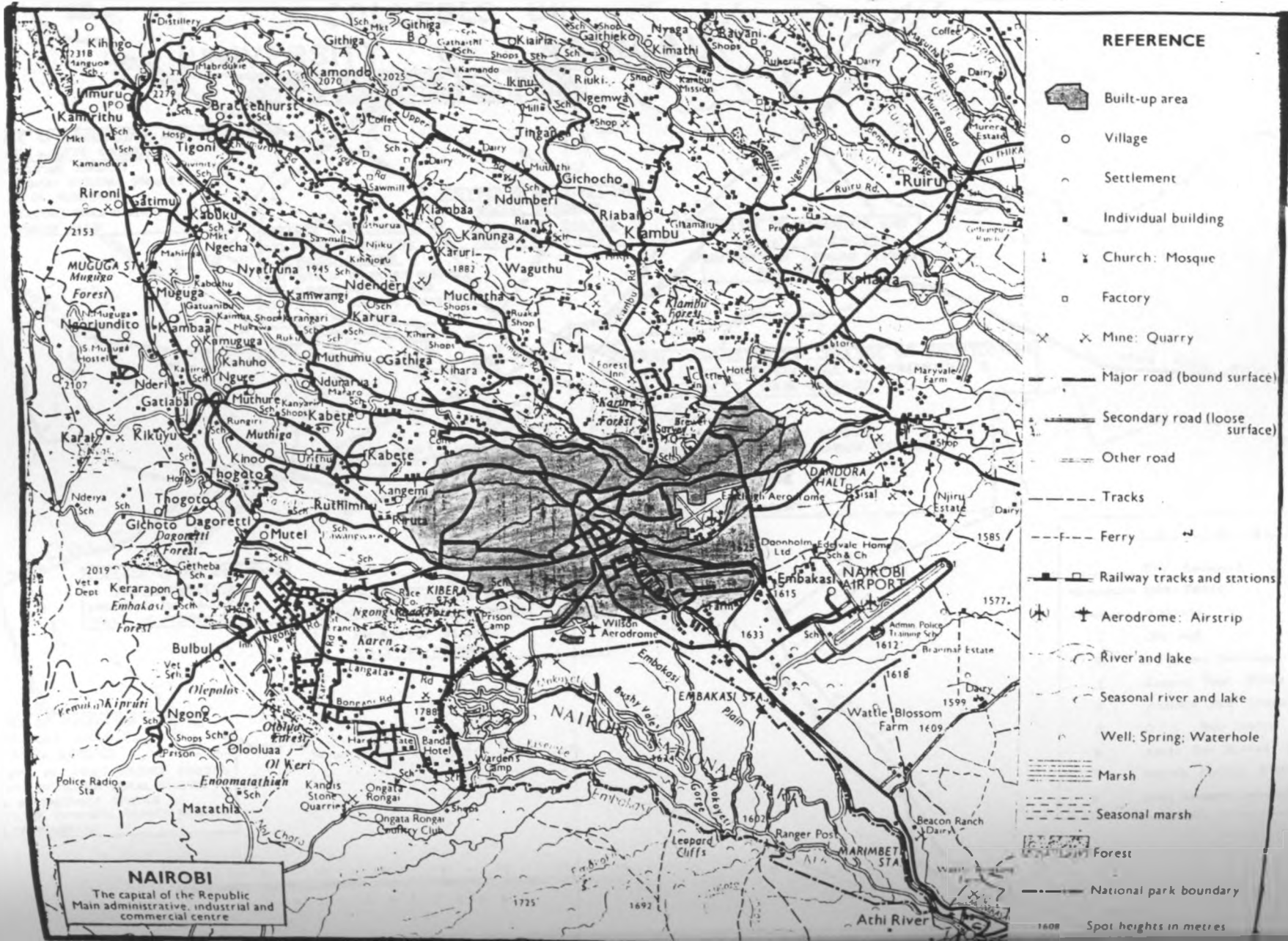
1.7 METHODOLOGY

1.7.1 STUDY AREA






















This no doubt, is a study that required a much wider scope than the scarcity of time and the limited financial resources at our disposal could permit. Working under the dictates of these constraints, the major study area was Nairobi, which administratively, is the capital city of the Republic of Kenya, and economically is a major industrial and urban centre. As the administrative headquarters, Nairobi is the seat of most government policy-making institutions and hence this Nairobi-based study provides sufficiently generalizable data on policy issues

touching on education and human resource development. At the same time, Nairobi hosts the oldest and largest university in Kenya – the University of Nairobi. As an industrial and urban centre, Nairobi has a fairly large human resource reserve as well as an equally large number of employing institutions with diverse manpower needs.

MAP 1.1 Map of Nairobi Province showing the Main Administrative and Commercial Centre.

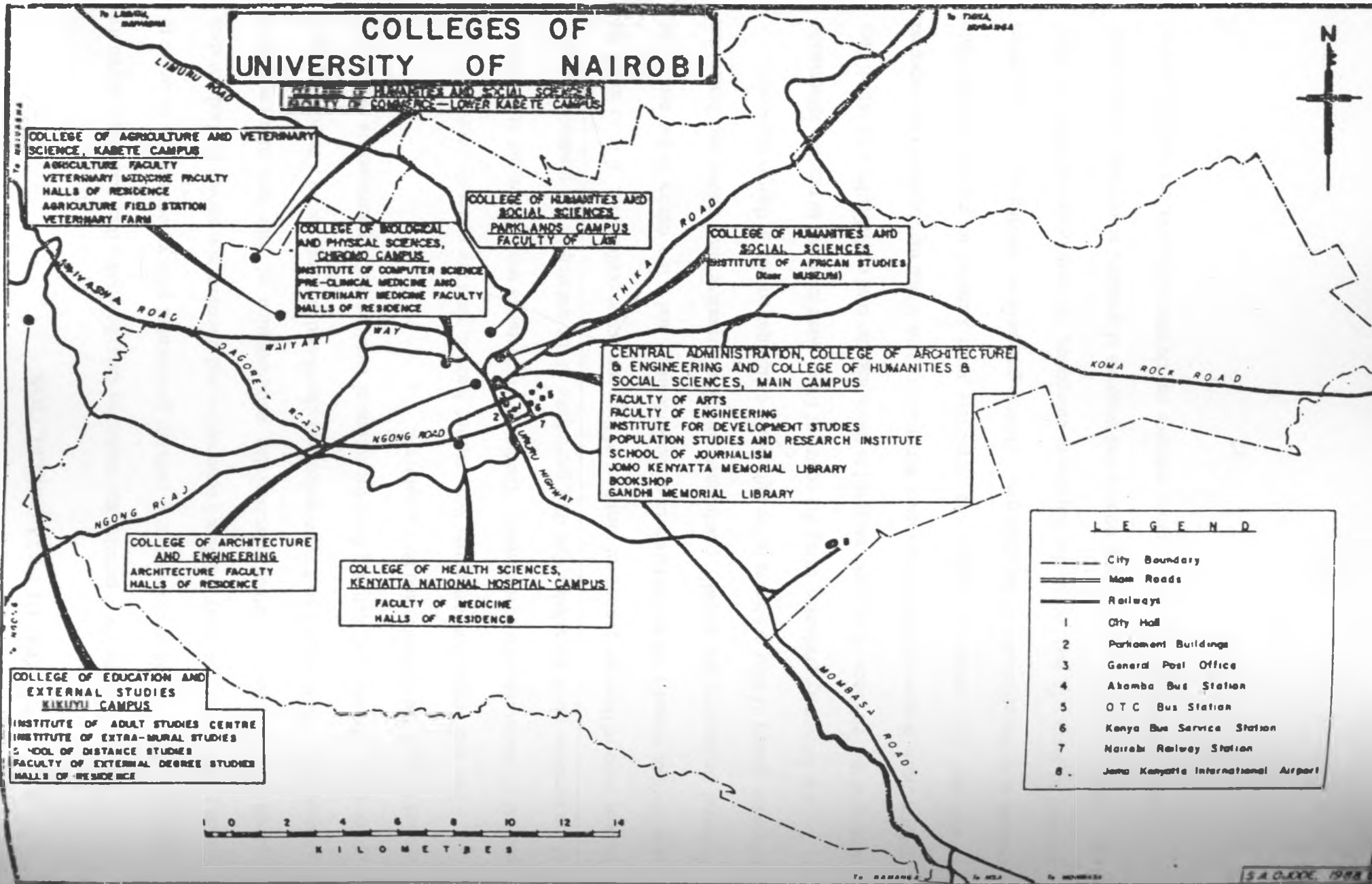


REFERENCE

-  Built-up area
-  Village
-  Settlement
-  Individual building
-  Church: Mosque
-  Factory
-  Mine: Quarry
-  Major road (bound surface)
-  Secondary road (loose surface)
-  Other road
-  Tracks
-  Railway tracks and stations
-  Aerodrome: Airstrip
-  River and lake
-  Seasonal river and lake
-  Well: Spring: Waterhole
-  Marsh
-  Seasonal marsh
-  Forest
-  National park boundary
-  Spot heights in metres

NAIROBI
The capital of the Republic
Main administrative, industrial and
commercial centre

Map 1.2 Colleges of the University of Nairobi



1.7.2 METHODS OF DATA COLLECTION

This study utilised both primary and secondary data. Secondary data was obtained mainly through books, journals, magazines, and relevant government policy documents. In order to obtain primary data, the study employed observation and questionnaire survey methods of data collection. The survey method involved the administration of four sets of standardised questionnaires, consisting of both open-ended and closed-ended questions, to a selected sample of university students and lecturers from the technical faculties and departments as well as the employed technical graduates and their employers.

The four respondent categories were chosen because they are variously involved in the process of human resource development. The university lecturers were chosen not only because of the common place knowledge that they participate in the training of the graduates but also because most of them are prominent members of their respective professions. It is no secret for example that virtually all the lecturers in clinical medicine and a few others in the rest of the technical professions are actually practitioners in their respective professions and hence can assess the quality of their graduates in the light of the skill requirements in their professions.

The university graduates, being the centre of focus, were expected to provide information relating to the relevance of the tasks assigned to them, and the ease or difficulty with which they perform them. Since employee performance appraisal is a task which the employers are expected to undertake as a matter of routine, the employers were sampled to provide an upto-date evaluation of the efficiency of the employed technical graduates in carrying out relevant duties assigned to them. In fact, of all the respondent categories, the employers remained the most strategically placed to assess the performance and progress of graduate employees. Being major components of the input side of the human resource development equation, the students, and of

course the lecturers, were sampled to assist in identifying the problems which continuously undermine the capacity of public universities to produce credible technical graduates.

Although the study focuses on technical training in public universities, this skill area is too wide for effective coverage given the limitations imposed on us by time and financial resources. Consequently, the study used a combination of stratified, multi-stage and snowball sampling techniques to arrive at the study sample.

Stratified and multi-stage random sampling techniques were used to select the lecturers and the students to be interviewed. This was necessitated by the fact that the students and the lecturers belong to a series of man-made stratas such as colleges, faculties and departments. To ensure that the selected sample is fairly representative of such a heterogeneous population, the technical professions were classified into four categories corresponding to the four colleges of the University of Nairobi, which provide technical training. These are Architecture and Engineering, Agriculture and Veterinary Sciences, Biological and Physical Sciences, and Health Sciences. Each of these four categories were subjected to a multi-stage random sampling. In the first stage, the faculties of Engineering, Agriculture, Science and Medicine were selected from the four colleges respectively.

In the second stage, the departments of Mechanical Engineering, Food Technology and Nutrition, and Meteorology were selected from the first three faculties. However, the faculty of medicine was exempted from this stage since it functions as one unit in terms of teaching and degree awards. In other words, whereas students registered in the faculties of Engineering, Agriculture and Science only take courses offered in one (or two in the case of the latter) of the departments within the faculty, those registered in the faculty of medicine undertake the courses offered in all the departments within the faculty. In the third stage, students and lecturers from the departments of Mechanical Engineering, Food Technology and Nutrition and Meteorology as

well as those from the faculty of Medicine were selected as shown in tables 1.1. and 1.2 respectively.

Table 1.1. Composition of Student respondents.

Year Of Study	DEPARTMENT/FACULTY										GRAND TOTAL
	MET		FTN		MECH.		MED.		TOTAL		
	M	F	M	F	M	F	M	F	M	F	
First	3	1	3	1	3	1	3	1	12	4	16
Second	3	1	3	1	3	1	3	1	12	4	16
Third	3	1	3	1	3	1	3	1	12	4	16
Fourth	3	1	3	1	4	0	3	1	13	3	16
Fifth	-	-	-	-	3	1	3	1	6	2	8
Sixth	-	-	-	-	-	-	3	1	3	1	4
Total	12	4	12	4	16	4	18	6	58	18	
Grand Total	16		16		20		24		76		76

MET - Meteorology, **F** – Female, **M** – Male **MED** – Medicine

FTN - Food Technology and Nutrition, **MECH** - Mechanical Engineering

Table 1.2 composition of lecturer respondents

DEPARTMENT/FACULTY	NO. OF LECTURERS
Meteorology	5
Food Technology & Nutrition	5
Mechanical Engineering	5
Medicine	5
TOTAL	20

The graduates and their employers were however, obtained through the snow ball sampling technique since it was not possible to construct a sampling frame for all employed technical graduates and their employers. We therefore, started with a small sample of graduates known to us and those identified through the lecturers and students, and used them to identify their colleagues who in turn led us to more of the graduates. This way, we arrived at an acceptable sample size of 36 employed technical graduates and 18 proprietors and senior human resources and training managers of the firms and institutions employing the said graduates.

Table 1.3 composition of graduate respondents.

DEGREE OBTAINED.	NO. OF GRADUATES
B.Sc. Meteorology	8
B.Sc. Food Science	8
B.Sc. Mechanical Engineering	10
B.Sc. Medicine	10
TOTAL	36

1.7.3 DATA ANALYSIS TECHNIQUES

Without data analysis, data collection in itself would be a worthless exercise. In analysing the data collected, this study utilised univariate, bivariate and multivariate analysis. The univariate analysis involved the use of simple frequency distribution tables to determine the response patterns for single variables. In bivariate analysis, suitable pairs of variables were cross tabulated to establish correlation. The multivariate analysis was however, applied in a single instance to determine how one variable (attendance of industrial attachment) varies simultaneously with two variables (department and year of study).

Since the analysis was largely qualitative, the study was restricted to the nominal and ordinal levels of measurements. In the nominal level, simple response categories such as "Yes"

and “No” were used while in the ordinal level, graded but unquantified categories such as “Good”, “Average” and “Poor” were used. Nevertheless, generally the data has been presented in a descriptive manner.

1.7.4 PROBLEMS ENCOUNTERED

In the process of carrying out this research, we encountered the following problems: -

- (i) **Bureaucratic red tapes:** - The channels to be followed in order to interview some respondents, especially the employers and their employees proved to be so long and complicated that it needed the patience of a life-long researcher. These red tapes which are prevalent in the large and well established firms rendered us unable to interview some sampled respondents. This problem was addressed by replacing such respondents with the readily accessible ones.
- (ii) **None responses:-** For a variety of reasons including the insistence by some respondents in filling in the questionnaires rather than being interviewed, and the inaccessibility of some respondents such as the graduate employees working on night shifts, the questionnaires were left behind to be filled in. However, very few of such questionnaires were received back. The problem of low response rate was taken care of by the fact that the number of respondents targeted for interview was far larger than the actual sample size.
- (iii) **Complicated respondents:** - some respondents kept on oscillating from one excuse to the other instead of filling in the questionnaires. Others kept on piling up impossible demands. Such complicated respondents either took unnecessarily too long periods to respond, or never responded at all.

(iv) **Foreign elements and irrelevant response:-** In some cases, the employers were relied upon to assist in identifying the graduate employees to be interviewed, or to respond to the self-administered questionnaires. Unfortunately however, some employers selected graduates who either attended foreign universities or who had not taken the targeted courses. At the same time, there were instances of inconsistency or irrelevant responses. Such responses were detected and eliminated at the data cleaning stage.

CHAPTER TWO

KENYA'S EDUCATION SYSTEM: A CURSORY RETROSPECTION

2.1 INTRODUCTION

A study of higher education and human resource development in Kenya would be incomplete without an overview of the general history of education in the country. Education in Kenya has had a long history during which it has undergone fundamental, and at times even radical changes. This chapter attempts to outline some of the salient changes that have occurred in Kenya's educational system over the years.

The Chapter begins by tracing the historical roots of formal education in Kenya and proceeds to analyse the contribution of the three major forces that shaped education in colonial Kenya namely, the missionaries, the colonial government, and the Africans. The traditional African education system which was largely informal has been deliberately left out of this volume which focuses on formal education from the mid 19th century. The evolution and development of university education in Kenya is the second major object of focus. Its inclusion in this Chapter is meant to provide a historical perspective within which technical training in public universities can be understood.

Efforts have also been made in this Chapter to sketch the changes in the education system as a whole since independence. In this regard, particular attention has been given to the impact of these post-colonial changes on the quality, quantity and goal of education. At the end of the chapter is a conclusion, which attempts to summarise key ideas discussed, while at the same time providing a bridge to the next chapter.

2.2 THE ESTABLISHMENT AND DEVELOPMENT OF FORMAL EDUCATION IN COLONIAL KENYA

2.2.1 MISSION EDUCATION

The history of formal education in Kenya dates back to 1846 when Johann Rebmann and Ludwig Krapf of the Church Mission Society (CMS) set up a mission school at Rabai Mpya near Mombasa (Anderson 1970,10-11; Bogonko 1992,18; Furley & Watson 1978,69-70; Sheffield 1973,8-9). After the end of slavery in 1873, Frere town was set up at the Coast as a settlement for the freed slaves. The missionaries then built up a school in Freretown where the freed slaves were trained in industrial and agricultural education. Similar schools were later built by the Holy Ghost Fathers (HGF) Mission in 1895 in Bura among the Taita, and by the German Neukirchen Mission (GNM) among the Pokomo.

By the beginning of the 20th century, the bulk of western education efforts were still confined to the Kenyan coast owing to the hostility of the interior tribes and the lack of infrastructural support for missionary activities in the interior of Kenya. However, the establishment of the British East African Protectorate in 1895, and the completion of the Kenyan section of the Kenya-Uganda Railway in 1901, opened up the interior of Kenya for missionary activities. Around 1900, the C.M.S opened a school in Kabete and later moved to Muranga, Embu and Maseno. Between 1906 to 1912, the Seventh Day Adventists (SDA) missionaries settled in Kamagambo, Gendia and Nyanchwa in the former South Nyanza District, while the Friends African Mission (FAM) Missionaries established bases in Kaimosi and Vihiga.

During the same period, the Mill Hills Mission (MHM) missionaries set up mission stations in Yala in Nyanza Province, Kakamega in Western Province and Nyabururu in former South Nyanza district. The African Inland Mission (A.I.M) missionaries on their part, settled in

Ukambani and Kikuyu around 1908. The Church of Scotland Mission (CSM) began by establishing a base in Kibwezi before moving to Kikuyu and Tumutumu around 1908.

Thus, by 1910, the central, coastal and western parts of Kenya had been effectively occupied by various Missionaries, providing formal education (**Anderson 1970,14-15; Bogonko 1992,19; Furley & Watson 1978,72-75**). During all this time, the missionaries were in total control of African education, deciding where to build schools and what to teach the Africans. Since the goal of mission education was to inculcate christian values on Africans, it is hardly surprising that mission education laid more emphasis on religious education and less emphasis on literary education. In fact, "the first goal of missionary education was to gain converts and train catechists who could both preach and teach, but literacy soon became a basic concern, since protestants had to be able to read the Bible for baptism" (**Oliver 1952,213**). It is evident therefore, that "literary education was never a priority in mission schools. It was the pressure from Africans ever since the early times which eventually forced missionaries to tilt their evangelical work by adding doses of academic education" (**Bogonko 1992,20**).

Apart from religious education, mission schools also emphasised industrial education in areas such as agriculture, carpentry and bricklaying. This industrial education was aimed at meeting the increasing missionary and government needs for tailors, masons, brick layers and carpenters. Through industrial training, the Africans were expected to provide these services readily and cheaply to both the missionaries and the white settlers. The emphasis on technical education was also based on the assumption that the Africans had certain natural deficiencies, which would not enable them to take literary education. First, the Africans were seen as a bunch of naturally lazy people who needed to be reactivated through hard work, which could only be achieved through technical education. Second, the Africans were also thought to have an inferior mental capacity suitable for nothing but manual work. As one scholar has observed, "Africans

were seen as being intellectually inferior and were steeped in primitive customs” (Sifuna 1980,9). From this belief stemmed the firm conviction on the part of the missionaries that religious education and industrial training were the only avenues through which the African person could be removed out of his predicament.

The industrial training offered to the Africans however, was so elementary and so manual that it hardly produced qualified artisans in the strict sense of the word. By and large, the African artisans graduating from the Missionary technical education were ill prepared to meet the demands of the job-market. As a result, “district and provincial officials constantly complained of the inability of the labour market to get African artisans to meet their demands” (Bogonko 1992,27).

The manual nature of the industrial education offered by the missionaries was a great source of discontent among the African parents and students during the first two decades of the 20th century. The African reaction to manual work and indoctrination concealed under the rubric of industrial training and religious education provided the first major blow to mission education in Kenya. In 1908, the CMS School, Maseno almost closed down as students pulled out in protest following the introduction of industrial work in their syllabus. Nyabururu MHM School faced a similar fate between 1910 and 1919 as students streamed out of the school due to their abhorration of religious education. Elsewhere in Western Province, the sons of chiefs attending Mumias MHM School went on strike in 1912, rejecting religious and industrial education and claiming that they deserved literary education, which would prepare them as leaders. (Bogonko 1984,23).

Until mid 1920s, mission education in Kenya was generally very limited, and never went high enough in the educational ladder. The education system evolved by the missionaries could be described as pyramidal with village schools at the base, central schools in the middle, and the

seminaries at the apex. The village schools were those which did not offer education beyond the third or fourth year of elementary education. The central schools were fairly well equipped and had classes upto Standard VI. Apart from formal education, which went upto Standard VI by the early 1930s, the seminaries had additional facilities for teacher training as well as technical and vocational education.

Starting from 1924, when the government set up the Native Industrial Training Department (NITD) at Kabete, those who successfully completed their sixth year of elementary education could join the NITD for a further two year training, maturing into full artisans and craftsmen. NITD served to supplement and crown the industrial training offered in mission schools. During the Second World War, the NITD was handed over to the army. After the war, it was used to rehabilitate ex-service men through industrial training. In 1948, NITD was repossessed by the department of education but continued as a technical and trade school.

On the same vein, the government built the Jeanes School, Kabete in 1925 to train teachers and supervisors for village schools. However, the missionaries had a lot of misgivings about the school, particularly because of the secular nature of the training it offered. Because of these misgivings, the missionaries began to develop their own teacher training facilities and by 1930, nearly all the missionary bodies operating in Kenya had one or more teacher training facilities. By 1931, the CMS was training its teachers at Kahuhia, Kaloleni (Giriama) and Butere, the HGF at Kaaba, the CCM at Mathari (Nyeri) and the MHM at St. Mary's School Yala. The FAM prepared its teachers at Kaimosi, while the SDA had a teacher training facility at Kamagambo. By 1931, the number of teacher training institutions in Kenya was 15, of which 12 were run by missionary bodies, while the government managed only three. These mission teacher training facilities were however, within the schools and it was not until 1935 that missionaries began to set up teacher training colleges separate from primary and secondary schools.

Another significant development in the field of African education occurred in the early 1920s when the hitherto elusive unity between the various missionary bodies was discovered, paving way for the formation of an alliance of protestant denominations by a group of Protestant missionaries (Sutcliffe 1973,21). The fruits of such unity was reaped in 1926, when the alliance of Protestant denominations set up Alliance High School which not only became the first African Secondary School, but also stood at the apex of the literary branch of the mission education. However, being a creation of the Protestants, Alliance High School only admitted Protestant Children, prompting the Roman Catholics to press for a secondary school for their children. After a long period of intense lobbying by the HGF missionaries, St. John's Kaaba School was elevated to a secondary school in 1930.

The geographical location of these two schools in the central part of Kenya naturally solicited a cry of neglect from the western parts of Kenya. As a result, the government allowed both the Roman Catholic and the Protestant denominations to set up one school each in the western region. Consequently, the Protestants elevated the CMS School, Maseno to a secondary school in 1938. The Catholics followed suit in 1939 by promoting the MHM School, Yala into a secondary school. What followed these developments was a phenomenal increase in the number of African secondary schools such that by 1949, there were 11 such schools.

The 1940s and the 1950s saw the colonial government and the Africans themselves, through their independent movements playing a much greater role in promoting African education. Even so, the missionaries continued to make a solid contribution in the field of African education. The missionaries had a fair share of difficulties such as lack of funds, lack of qualified teachers, and constant rebellion against their religious and industrial education by the Africans. These difficulties notwithstanding, it can be concluded that "despite the lack of

centralised control over standards or policy, the missions laid the foundations for future educational development in Kenya" (Sheffield 1973,12).

2.2.2 THE COLONIAL GOVERNMENT AND AFRICAN EDUCATION

Unlike the missionaries who took keen interest in promoting education in Kenya from the very beginning, the colonial government was initially reluctant to participate in education in Kenya. The involvement of the colonial government in education in Kenya coincided with the appointment of Sir Charles Elliot as the new governor in 1903. Elliot's policy of encouraging whites to settle in Kenya greatly catalysed the participation of the colonial government in the field of education. More precisely, "it was the arrival of European settlers in Kenya from 1903 onwards, who were anxious to see their children well taught, which made Kenya's colonial government consider seriously participating in Kenya's education system. The government had neither a policy nor a development plan to guide its participation in a field where missions had gained extensive and informed experience particularly in regard to the education for Kenyans" (Lugumba & Ssekamwa 1973,3).

The appointment of J. Nelson Frazer in 1909 as the advisor to the colonial government of the British East Africa on education, was the first major effort by the colonial government to involve itself in African education. Soon after his appointment, Frazer prepared a report (The Frazer Report on Education in the East African protectorate) which urged the government to take a greater responsibility for the education of all races in Kenya by setting up a department of education to regulate and co-ordinate education in the whole colony. The report further recommended that there should be three branches of education to cater for the European, African and Asian children separately. While Frazer encouraged academic type of education for the European and Asian children, he stressed the need for industrial and agricultural education for

their African counterparts, thereby laying the foundation for racial segregation for education in Kenya. In order to promote African education, Frazer proposed that the government should provide grants-in aid to mission schools.

The government adopted the Frazer Report in 1911 and set up the Department of Education with James R. Orr as its first director. Orr introduced a system of payment of grants in-aid according to how a school performed in technical subjects. Thus, the colonial government initially got involved in African education by providing the guidelines and framework within which mission education developed, while at the same time providing money grants to mission schools to facilitate African education.

In 1918, the government set up the East African Protectorate Education Commission to review the education provided in the colony. The commission presented its report in 1919, urging the government to continue playing an even greater role in education, and to register and subsidize all mission schools according to their performance. The 1919 report further suggested that teachers should be graded according to some qualifying examination and their salaries subsidized by the government. The report also pointed out the need for the government to provide scholarships for African students to enable them pursue higher education abroad.

It is particularly important to note that although the government began to provide grant to mission schools from 1911, the number of schools receiving such grants remained very few as late as the 1930s. This is shown in Table 2.1:

Table 2.1

Government Assisted Mission Schools 1932-1938

YEAR	Total Number of Mission Schools	No. of Assisted Mission Schools	% of Assisted Mission Schools
1932	1264	218	17.2
1933	1477	247	16.7
1934	1374	291	21.2
1935	1417	304	21.5
1936	1437	374	26.0
1937	1503	368	24.5
1938	1398	391	28.0

Source: Colony & Protectorate of Kenya, Education Department Annual Reports 1932-1940.

Table 2.1 shows that the proportion of mission schools receiving government grants increased by 10.8% during the seven years under review. In other words, while the total number of mission schools increased at an average rate of 22.3 per annum, the number of schools receiving government support increased at a slightly higher rate of 28.8 annually during the seven years. This, no doubt, was an impressive increase. However, our contention is that if the proportion of mission schools receiving government grants had increased at the same rate from 1911 when the grant system was introduced, then by 1938, about 44% or 615 of the 1938 mission schools would be receiving government grants. That a mere 28% of the mission schools were receiving grants by 1938 warrants the conclusion that the grants remained confined to a very small number of mission schools during the first one and a half decades of its inception. In fact, it would appear that the decision to increase the number of mission schools benefiting from the government grants especially from the mid 1920s, was calculated to counter the African clamour for independent secular schools which was at its zenith then.

Aiding mission schools was only beneficial to those regions where mission schools had been well established. However, there were certain areas where mission schools had not been set up or where missionary activities in general had not penetrated. Such areas were Maasai land, Nandi, Kipsigis, Keiyo Marakwet, Digo Land and parts of Ukambani. To correct the regional educational imbalances, the colonial government decided to set up Government African Schools (GAS) to cater for children in areas not effectively served by mission schools.

The first GAS had been opened way back in 1909 in Kitui but was closed down in 1914 at the start of the First World War, only to reopen after the war as a police school. The Kitui School was later reclaimed by the Department of Education in 1922. The second GAS was opened in 1914 in Machakos – the Ukamba Native School, Machokos, which was later renamed Machakos GAS. In 1919, Narok GAS was opened by the provincial administration, and like the Kitui School, was taken over by the department of education in 1922. Other GAS opened in the 1920s included Waa GAS (1921), Kabianga GAS (1924), Kajiado GAS (1925), Kapsabet GAS (1925), Tambach GAS (1926) and Kapenguria GAS (1929).

The GAS were set up primarily to teach and promote technical education. In this regard, Tambach and Kapenguria GAS were established to promote agriculture, while Machakos and Kabianga Schools were meant to be centers for training technicians. Narok and Kajiado on the other hand specialised in Ghee production skills. This specialisation however, did not entail complete neglect of the other aspects of technical education. In the Narok and Kajiado schools for example, “Maasai boys were also taught rough carpentry, building of dams and wells, elementary iron work and transport. But the production and marketing of ghee was paramount and literary education was only secondary” (Bogonko 1992,36).

The overemphasis on technical education dealt a great blow on literary education in the GAS. Until mid 1930s when the PSE laid more emphasis on technical subjects, the GAS greatly

excelled in this examination which marked the end of Primary education then. However, with the introduction of African Primary Schools syllabus, and the shift of emphasis from technical to literary education, the GAS began to perform very poorly. The new requirement that a student had to pass three literary subjects out of the four subject-pass necessary to obtain a PSE certificate coincided with the rise to prominence of a new generation of LNC schools, notably Kakamega, Kagumo and Kisii which had strong bias towards literary education.

In 1924, the Phelps-stokes Commission Report was presented to the colonial office. The report underscored the need to educate the Africans not only for jobs, but also to enable them take their rightful positions in society. The report recommended the incorporation of elements of African culture such as music and dancing into the school curriculum. The report noted the need to broaden the school curriculum to include hygiene, agriculture, industry, religion, writing and reading, while at the same time leaving room for recreation. It further proposed the establishment of teacher training facilities so as to increase the quality of African education. The latter proposal led to the setting up of Jeanes' School, Kabete to train teachers and supervisors for the village schools. The Jeanes' School was later joined in this endeavour by the Machakos GAS in 1928.

In line with the Phelps-stokes Commission Report, the government passed the 1924 Education Ordinance which empowered the government to develop, control and supervise education in Kenya, and further provided for the creation of three Central Advisory Committees to deal with European, Asian and African education. Although the committees were set up in 1924, it is interesting to note that by mid 1930s there was still no African on any of the Central Advisory Committees, including the one on African education. African interests were being represented in the committee by the missionaries. To be more precise, "it was not until 1936 that two Africans were made members of the advisory council on African education" (Lugumba & Ssekamwa 1973,13).

The advisory council on African education proposed the creation of district education committees. Consequently, School Area Committees (SACs) were formed comprising of government officials, settlers, missionaries and Africans. The SACs were to be the sole recipients of applications for new school sites, recommending and approving the schools needing assistance both from the local and the central governments, and ensuring that schools within their areas were properly managed.

In 1925, a Permanent Advisory Committee on Education was set up by the colonial office. The committee issued its first report in 1925 which came to be known as the 1925 memorandum. This memorandum stated that, "Education should be adapted to the mentality, aptitudes, occupations and traditions of the various people, conserving so far as possible all sound and healthy elements in the fabric of their social life; adapting them where necessary to changed circumstances and progressive ideas, as an agent of natural growth and evolution. Its aim should be to render the individual more efficient in his or her condition of life, whatever it may be, and to promote the advancement of the community as a whole through the improvement of agriculture, the development of native industries, the improvement of health, the training of people in the management of their own affairs, and the circulation of true ideals of citizenship and service" (**Great Britain Colonial Office 1925,4**).

The 1925 Memorandum established certain broad principles which over the years. have become the basis upon which subsequent educational proposals have been made (**Scanlon 1955,339**). In recognition of the need for sufficient qualified teachers, inspectors and supervisors, the memorandum stressed the need to accelerate the training of African staff while leaving open the option of recruiting staff from overseas to meet deficits. In order to tie education to the local needs, it proposed that African vernaculars should be preserved and

textbooks and methods of teaching adapted to the African situation. The 1925 memorandum also urged for increased efforts in women education which had seriously lagged behind that of men.

Another Education Ordinance was passed in 1931 which not only empowered the government to issue grant-in-aid to African secondary schools according to pupil enrolment, but also imposed strict control over school expenditure and the governing boards of all African schools receiving grant-in-aid. Such schools were now required to keep proper accounts and to submit annual returns to the Director of Education. Furthermore, the African secondary schools receiving grants were to remain open for inspection by education officers at any time.

By 1934, it was evident that the SACs created in the 1920s had performed below par. As a result, the colonial government abolished and replaced them with the District Education Boards (DEBs) comprising the DC as the chairman, the Inspector of Schools as secretary, a medical officer, an agricultural officer, representatives of the missions and Africans nominated by the LNCs. The DEBs were assigned the task of allocating grants-in-aid to sub-elementary schools, considering applications for new schools, allocating bursaries to secondary school pupils, deciding and reviewing salary scales for teachers, overseeing the general promotion of education in the native reserves, and setting up schools for Africans.

As the number of the DEB schools increased, their performance too improved such that by the second half of the 1930s, they had completely outshone the mission schools. The secret behind the success and the ensuing great demand for the DEB schools was their unparalleled efficiency in providing literary education to Africans. This efficiency stemmed from the fact that unlike the mission schools, the DEBs were divorced from European control and supervision. In any case, the fact that the schools were financed by the Africans made Africans identify easily with them. This way the number of the DEB schools increased such that by the end of 1945, they totalled 66 schools.

The permanent advisory committee set up by the colonial office in 1925, issued two other policy pronouncements in 1935 (The 1935 Memorandum) and in 1943 (The 1943 Memorandum). The two memoranda called for increased efforts towards promoting adult literacy, with the 1943 memorandum going a step ahead to urge the colonial government to consider the provision of universal education for all children as its long-term educational goal.

The year 1949 provided a major landmark in the history of education in Kenya. In that year, a committee was set up under the leadership of a missionary, Archdeacon Beecher, to synthesise all the previous reports into a workable Ten Year Plan for the development of African education. The commission was to enquire into the scope, content and method of African education, its financing and the issue of African teacher's salaries. The Beecher Report proposed the restructuring of African education and the renaming of its parts as primary, intermediate and secondary education, instead of the previous elementary, primary and secondary education. In fact, "the most discussed – perhaps because it was the most obvious – change brought about by the Beecher Report was the introduction of a 4-4-4 system of primary, intermediate, and secondary schools to replace the previous 6-2-4 organisation" (Sheffield 1973,42).

Under the 6-2-4 system, education began in the Elementary Schools where one had to enroll in substandard A, move through substandard B, Standard I Standard II, Standard III, and complete his sixth year of elementary Education in Standard IV. Primary Education was very short, starting in Standard V and ending in Standard VI. Secondary education was in two phases. With forms I and II forming junior Secondary, while Forms III and IV form the Senior Secondary.

However, under the 4-4-4 system of education proposed by Beecher, the Primary School would begin in Standard I, Move through Standard II and III and end in Standard IV with the Common Entrance Examination (CEE) which would become the basis for admission into

intermediate school at Standard V. The intermediate school would go through Standard VI, standard VII and end in standard VIII where students would sit for Kenya African Preliminary Examination (KAPE). Those who passed KAPE would be admitted to Secondary Schools in Form I and sit for the Kenya African Secondary Examination (KASE) which marked the end of Junior Secondary Schools in Form II. Senior Secondary education began in Form III and ended in Form IV with the Cambridge School Certificate (CSC) which was the basis of admission into the University college of East Africa at Makerere.

The Beecher Report noted with concern that supervision, teacher training and other aspects of planned development had failed to keep pace with the rapid expansion at the primary level. To put this expansion in control, the report recommended that the DEBS should be reconstituted and charged with the responsibility of overseeing primary and intermediate schools. Furthermore, each school would now be required to appoint board of governors to ensure policy implementation and to promote local participation under the reconstituted DEBS. The Report also urged for the recognition of African Independent schools and their inclusion into the education system. It observed that planning for education should be carried out area by area so that each area can grow at its own pace. Beecher recommended the expansion and improvement of teacher training facilities so as to improve on the quality of teachers, while at the same time replacing untrained teachers with trained ones. This means that the Department of Education had to shift its focus from increasing the quantity of education offered in African schools, to improving their quality.

The Beecher Report was received with a lot of hostility from the Africans who accused Beecher of perpetuating racial segregation of the education system by confining African primary education to four years while the Europeans and the Asians had a seven year continuous primary education. In any case, the 4-4-4 system of education was seen as a step backwards in the move

towards achieving permanent literacy since the four year primary course would be too short and yet very few Africans would be able to go beyond Primary education. The Report also failed to address the question of frequent examinations, which encouraged great wastage. Furthermore, the shift in emphasis from quantity to quality would dash the hope of Africans achieving universal literacy as expounded by the 1943 memorandum, since it would inevitably slow down the growth of their enrolment. Despite these flaws in the Beecher Report, and the African protest against it, the report was adopted by the government in 1952 and "throughout the 1950s the Beecher Report remained the basis of the government's policy on African education" (Sheffield 1973,63).

Some of the weaknesses identified in the Report began to hurt African education as soon as the report was implemented. The 1955 Education Report for example revealed that only 31.2% of the students enrolling in Standard I were completing their four-year primary school course successfully, while 3.7% completed the intermediate course and a paltry 0.08% completed their secondary education. The enrolment in secondary schools also remained low throughout the colonial period, being 13% in 1958, 12.8% in 1959 and 12.5% in 1960.

The next significant development in colonial education came through the Binns Report of 1952. The Binns Report however, needs less attention since it did not differ significantly from the Beecher Report. In fact, as James Sheffield has observed, "the differences in the changes advocated by the two reports were less a matter of content than of degree" (Sheffield 1973,45).

In addition to what Beecher had proposed, the Binns Report stressed the importance of religious basis for education, and the need for practical work to be introduced into the curriculum. The Report also urged for the preservation of selected African vernaculars while advocating general elimination of Swahili except where it is the local language. The war against Swahili language was prompted by the feeling that it impeded the learning of both the vernacular and

English. Binns A. L. and his co-authors of the Binns Report namely Professor B.A Fletcher and Miss. F.W.G. William noted that "to preserve the vernacular languages of Africa is to preserve the tribes that speak them and to strengthen the moral sanctions that rest on tribal membership" (Binns Report 1952,80-81).

In 1955, a slight moderation was done on the education system when KASE taken in Form II was scrapped. This made the secondary education to be a continuous four year course, adding more meaning to the 4-4-4 system of education which now meant four complete years of study in the primary, intermediate and secondary schools. The 4-4-4 system of education remained in place until the end of 1961 when intermediate education was abolished, paving way for a continuous eight years of primary education. Corresponding to this change was the elimination of both CEE and KAPE such that at the end of eight years primary education, the student now sat for the Primary School Examination (PSE). This remained the structure of African education until the time of independence.

2.2.3 AFRICAN INITIATIVES IN FORMAL EDUCATION

Although the missionaries were the pioneers of formal education in Kenya, mission education for a long time remained so deficient that even the colonial administrators acknowledged and constantly harped on its inadequacy. Mission education's main undoing was its emphasis on technical and religious education which greatly impeded the development of literary education among Africans. As an illustration of this fact, one scholar has pointed out that "in the 1920s and the 1930s, administrators throughout Kenya complained of their inability to secure literate Africans to engage as clerks and hut counters in the government machinery" (Bogonko 1992,27).

Relatedly, the Africans aspired for literary education and therefore saw technical and religious education being offered to them as a thin veiled attempt to relegate them to second class citizens. This realisation generated a wave of disenchantment with mission education and promoted the setting up of independent African schools.

In 1922, a group of Kikuyu elders met in Fort Hall (Muranga) and resolved to provide secular education for their own sons. In that year, the group set up Gakarara Independent African School which however, operated in the open air until 1927 when buildings were put up for the school. Later, a similar school was opened up at Githieko in Kiambu. As the number of such schools increased, the need to standardise and harmonise their activities became apparent. In 1929, at the height of female circumcision controversy in central Kenya, the owners of the already established independent African schools formed the Kikuyu Independent Schools Association (KISA) to oversee the promotion and development of the independent schools. Soon after its establishment, KISA got embroiled in leadership wrangles, with a more conservative group accusing KISA leadership of adapting too much of the western ideas and compromising with the government and the missionaries who were supposed to be seen and treated as enemies. As a result, a less compromising and more conservative association was formed known as the Kikuyu Karinga Educational Association (KKEA). The efforts of these two bodies speeded up the growth and expansion of independent schools in central Kenya.

Even though much of the available literature on independent schools tend to focus on central Kenya, it should be noted that the independent schools movement was not confined to central Kenya, neither did it begin there. As a matter of fact, "it was in western Kenya that the movement - religious and political - began led by mission educated Africans John Owalo. Rev. Simeon Nyende, Rev. Ezekiel Apindi, Reuben Omulo, Jonathan Okwiri, Mathayo Otieno. Benjamin Owuor and Joel Owino... The people of western Kenya were the first in Kenya to

disagree with Christian Missionary control of their way of life; they wished to interpret Christianity according to the way they saw fit. Such were the aims of the Nomiya Luo Mission led by John Owalo; the two issues over which they and the missions disagreed were polygamy and male circumcision" (Abreu 1982,200-201).

The independent schools however, faced many difficulties. The quality of education offered was generally very low, owing to their inability to secure quality teachers. Lack of sufficient funds also limited their expansion. Despite all these hardships, many children ran away from mission schools to join independent schools. The schools thus continued to grow in size and numbers such that by 1935, when they finally agreed to follow government syllabus, there were already 34 independent schools with an enrolment of 2,518 pupils. The problem of training teachers for these schools was solved on the 7th January 1939, when the Kenya African Teachers College was established out of the Githunguri independent school. The college which was essentially African borrowed extensively from the west but rejected the government syllabus and examinations.

African education suffered a major set back in 1952 when all the independent schools were closed down following the declaration of the state of emergency in Kenya. The schools were accused of spreading propaganda against the colonial government and encouraging the growth of Mau Mau. By the time of their dissolution in 1952, there were more than 200 independent schools with an enrolment of about 40,000 pupils.

The other forum through which the Africans participated in the promotion of formal education was the Local Native Councils (LNCs). The LNCs were created by the colonial government in 1925 in an attempt to stem the tide of African nationalism by shifting the focus from national to local issues. The LNCs had a wide range of duties including provision of education, road construction, promotion of agriculture and afforestation. All these were to be

financed by funds levied on Africans by the LNCs. Soon after they had been constituted every LNC took the provision of education to Africans as its priority, and collected money specifically meant for the erection of secular schools. By 1930, a number of the LNCs had collected substantial amounts of money for the purpose of putting up LNC central schools. However, no school had been put up as yet, since the colonial government was still pessimistic about their viability and so had not approved their construction.

Owing to sustained pressure from the Africans, the government approved the construction of secular schools at Kakamega, Kagumo and Kisii in the early 1930s. Kakamega School was completed in 1931 and had its first intake in January 1932, while Kagumo and Kisii schools opened their doors to students in 1933 and 1935 respectively. These LNC schools were initially meant to provide primary "C" level of education (standard IV to VI) but lack of students meeting the entry requirements forced the government to lower them to meet the standards of the available students. Entry into Kakamega and Kagumo schools was lowered to Standard III while for Kisii school was lowered to sub-standard A. Kakamega, the oldest of the three LNC schools attained Standard VI and had its pupils taking the PSE in 1935. Four years later, when the standards of those seeking admission at Kakamega LNC school had improved substantially, the school did away with Standard III.

One of the Major problems facing these early LNC schools was the refusal by some missionaries, especially the MHM, CCM and the HGF, to let their pupils enter these schools despite the fact that these schools were officially declared interdenominational. This difficulty was however, countered by the fact that the protestant missionaries were not as strict as their Catholic counterparts. In this regard, the CMS Butere, CMS Nambare, FAM Kaimosi, CGM Kima and PAG Nyangori schools acted as feeders to the Kakamega LNC school. The Kagumo school sourced its pupils from the CSM Tumutumu, CSM Kikuyu, CMS Kabare, CMS Mutira,

CMS Kahuhia, CMS Weithaga, CMS Kabete, AIM Kinyona, AIM Githumu, AIM Kijabe and the GMS Kambui schools. Apart from preparing its own students, the Kisii LNC school was fed by the CMS Marienga, SDA Kamagambo and SDA Nyanchwa schools (**Bogonko 1985,11-12**).

Further expansion of the schools and increase in student enrolment was also fostered by their relatively better performance as compared to the old and more established mission schools. For example "in the PSE results of the late 1930s, Kakamega, Kagumo and Kisii schools completely negated and outshone the efforts of the missionary bodies on education" (**Bogonko 1992,55**).

In 1939 for example, Kakamega school alone had eight of its PSE candidates qualifying for secondary education while only four candidates made it from all missionary primary schools in North Nyanza combined. In the same year, Kagumo had 15 passes as compared to 10 from all missionary primary schools in central Kenya combined. In South Nyanza, the story was even more interesting. All the five students who passed their PSE in 1939 were from Kisii LNC school. This excellent performance triggered a spate of mass exodus of students from the mission schools to the LNC schools.

The LNC schools faced two other problems. First, there was the problem of name. Whereas the Africans wanted these schools to be referred to as LNC schools, the government insisted in referring to them as GAS. The GAS name was however, not appropriate since it lumped these schools together with a fairly different group of schools built and maintained by the government such as Kabianga and Kapenguria GAS schools. Second, there was the problem of curriculum. While the Africans had built these schools as centres for promoting literary and higher education, the government insisted that these schools should offer industrial education. Sustained pressure from the Africans forced the government to give in by introducing the African primary schools syllabus in 1935, which de-emphasised technical education and placed more

weight on literary education. These initial problems notwithstanding, the three schools developed into full primary schools offering candidates for PSE by 1938, KASE by 1946 and the CSC by 1956.

2.3 EVOLUTION AND GROWTH OF UNIVERSITY EDUCATION IN KENYA

2.3.1 UNIVERSITY EDUCATION IN COLONIAL KENYA

By its very design, the racially stratified colonial education system denied Kenyans sufficient room for higher education. In shaping the course of education in colonial Kenya, the government was guided by the incessant fear that higher education would enlighten the Africans and make them demand greater freedom and equality. Because of this, higher education not only began late, but also developed at an extremely slow pace during the colonial era. In fact, it was not until 1949 that university education became obtainable locally in the whole of East Africa. Until then, students from East Africa had to travel to South Africa, India, Britain, or America to obtain University education. Even from 1949, it was only Makerere University college of East Africa that offered university education and so Kenyans, and indeed students from the rest of the East African region wishing to pursue post-secondary higher education had to go to Makerere. This state of affairs persisted until 1956 when the Royal Technical College of East Africa was put up in Nairobi.

It is evident from the foregoing that the history of higher education in colonial Kenya can not be handled in isolation from the rest of the British East Africa. The seeds of higher education were planted in East Africa in 1921 when the colonial government built a post-primary technical school for Ugandan Africans on Makerere Hills on the outskirts of Kampala. In 1922, the school was renamed Makerere College and began offering certificate courses in Education, Medicine, Survey, Agriculture and veterinary Sciences. In 1933, Makerere became the first institution in

East Africa to offer the ordinary level school certificate syllabus, presenting its first CSC candidates in 1935 (De La Warr 1937,77).

To systematise further development in higher education, the British government appointed a commission under James Currie in the early 1930s to look into the possibilities of evolving a system of higher education in the British Africa. In 1933, the James Currie commission presented its report (the James Currie Commission Report on Higher Education in British Africa) which recommended that Makerere College (Uganda), Yaba College (Nigeria), Gordon College (Sudan), Achimota College (Ghana) and Fourah Bay College (Sierra Leone) should be gradually transformed into Universities to meet the increasing African demand for higher education (Furley & Watson 1978,299-300; Bogonko 1992,76).

In 1936 the colonial office appointed a commission under Earl De La Warr to look into the possibility of making Makerere the centre of higher learning for the whole of East Africa, in accordance with the recommendation of the James Currie Report of 1933. The findings of the committee were tabled to the colonial office in 1937 recommending a speedy elevation of Makerere College into a university with a definite vocational bias. In addition to the professional courses in Education, Medicine, Agriculture, Survey and Veterinary science which it had been offering since 1922, the college would also start awarding its own diplomas and would become a centre of research.

The De La Warr Report was adopted by the colonial office and Makerere began offering courses for two years beyond the ordinary level school certificate. The college was further renovated, a school of fine art started and female students admitted for the first time. From 1939 the use of lectures and tutorials replaced lessons and classes at Makerere. However, in terms of student's enrolment, Uganda continued to provide the bulk of the students until 1950 when her percentage contribution began to decline.

Table 2.2 Students enrolment at Makerere College by Country of Origin for selected years

YEAR	UGANDA	KENYA	TANGANYIKA & ZANZIBAR
1934	127	15	8
1940	113	28	40
1950	90	91	53
1955	189	203	159
1958	272	316	232

Source: Higher Education in East Africa, 1935-1960.

The changes in the percentage composition of students at Makerere from 1950 can be attributed to the decision by the governments of the concerned countries to tie enrolment to financial contribution from each country. According to this scheme, Kenya, Uganda and Tanganyika were each allocated 26% of the places at Makerere if they paid their quota. Zanzibar was allocated 12% with similar conditions and the remaining 10% of the places were declared a "free pool" open to students from all countries. Any country which failed to pay its quota lost a similar percentage of places as its deficit to the "free pool" (Bogonko 1992,84).

In 1950 for example, out of the 234 places available at Makerere, Kenya and Uganda were entitled to 61 places each while Tanganyika and Zanzibar combined deserved 89 places and the remaining 23 places were for the free pool. However, looking at Table 2.2, it can be inferred that whereas Uganda and Kenya paid their quotas and produced highly qualified candidates who competed favourably for the free pool places, Tanganyika and Zanzibar did not complete their quotas which made them forfeit some of their entitlements, besides losing eligibility to compete for the free pool places.

The impressive percentage contribution by Kenya from 1955 can be attributed to a number of factors. First, the adoption of the Beecher Report in 1952, and the shift from the 6-2-4

to a 4-4-4 system of education greatly reduced wastages. Second, the decision to scrap KASE in 1955, which made secondary education in Kenya a continuous four year course reduced wastages even further, paving way for many Kenyans to pursue higher education. Third, by mid 1950s, the LNC schools were also sending candidates for the CSC which was the basis of admission to Makerere.

In 1943, the secretary of State for the colonies appointed a commission under Sir Cyril Asquith to re-examine the needs of higher education, and to consider the principles which should guide the promotion of higher education and the development of universities in the colonies. The Asquith Commission Report of 1945 which was adapted by the colonial office recommended that the existing colleges in the British colonies should be elevated to the status of University colleges and enter into a special relationship with the University of London for degree awarding purposes before they could become full universities. As one scholar has argued, "in striking contrast to the 1937 De La Warr commission, the Asquith commission played down the vocational role of higher education and stressed the importance of the university in providing men trained for public service and professional careers... Thus the most significant impact of the Asquith commission upon educational policy was in shifting emphasis from the vocational to the academic" (Sheffield 1973,31). Following the recommendations of the Asquith commission, Makerere became a university college attached to the University of London in 1949 and was renamed Makerere University College of East Africa. In 1950, Makerere began to offer Degree courses, passing out its first graduates in 1953.

From the early 1940s, a number of factors continuously undermined Makerere's monopoly over higher education in East Africa. First, Makerere increasingly found it difficult to meet all the admission requirements of the many students qualifying for higher education in the region. Second, as the likelihood of Makerere gaining a University college status became more

apparent, Kenya and Tanganyika naturally desired to evolve their own post-secondary institutions. Third, having moved away from the practice of a vocational college to a college which would train future leaders and administrators as proposed by the Asquith Commission Report in 1945, Makerere college paved way for the establishment of another institution offering higher technical and commercial education in the region.

Against this background, in May 1947 a committee was set up under Mr. G.P. Willoughby to look into the prospects for further development of higher education. The Willoughby Report was presented in March 1949 and proposed that a technical and commercial institute should be built in Nairobi, which would eventually grow into a university. These developments coincided with the formation of the Gandhi Memorial Academy by Asians throughout East Africa, with the aim of putting up a college of higher learning in arts and science in Kenya to honour the late Mahatma M. Gandhi. Realising that the proposed technical and commercial college was in tune with their objectives, the Asians accepted to merge their project with the proposed college. In 1951, the proposed college received the Royal Charter and was named Royal Technical College of East Africa (RTC). The foundation for the RTC was laid in April 1952 by the Governor of Kenya, Sir Philip Mitchell and was opened in 1956 as a middle-level college producing technicians in commerce, engineering and architecture.

The funding for the construction of RTC was provided as shown in Table 2.3.

Table 2.3 Funding of the Construction of RTC

SOURCE	AMOUNT IN £	% CONTRIBUTION
Welfare & Development Fund	345,500	34.1
Gandhi Memorial Academy	200,000	19.7
Kenya	160,000	15.8
Uganda	100,000	9.9
Tanganyika	50,000	4.9
Zanzibar	8,000	0.8
Others	150,500	14.8
TOTAL	1,014,000	100.0

Source: Carr-Saunders Report 1958,31.

Towards the end of 1957, the colonial government set up a working party on higher education in East Africa chaired by Sir Alexander Carr-Saunders. The Carr-Saunders Report observed that higher education in East Africa should continue being planned and financed inter-territorially and warned against duplication of courses in different colleges. The report urged each college to specialise in a given profession so that students from within the region could be admitted to any of the colleges, depending on their career choices. It proposed that, like Makerere, the RTC should evolve into a university college of Kenya affiliated to the University of London.

Another working party was formed in 1958 under the Vice-Chancellor of London University, John F. Lockwood to establish modalities for creating new institutions of higher learning. Lockwood proposed the immediate elevation of the RTC into a second interterritorial university college of East Africa. Consequently, in 1961 the RTC became a university college attached to the University of London and was renamed the Royal College, Nairobi. In addition to the advanced level courses in arts and sciences, it continued offering professional courses in architecture, commerce, domestic science, engineering, fine arts, surveying and veterinary

sciences. It also began offering general degrees in arts, science and engineering as well as postgraduate courses in public administration.

2.3.2 UNIVERSITY EDUCATION IN KENYA SINCE INDEPENDENCE

In 1961 when the RTC became a university college, another university college was also put up in Dar-es-Salaam. In June 1963, the same month Kenya became independent, these two university colleges together with Makerere University College were amalgamated into the University of East Africa with Makerere specialising in medicine and agriculture, Nairobi in engineering and architecture, and Dar-es-Salaam in law, as its constituent colleges.

Although each of the university colleges was initially meant to specialise in a given profession, duplication of courses began to take root towards the end of the 1960s as Kenya and Tanzania struggled to catch up with Uganda in the field of higher education. As a result of this trend, the governments of these countries set up a working party on higher education in 1968 which proposed that each of the three university colleges constituting the university of East Africa should become autonomous universities. This formally dismantled the University of East Africa and brought into existence the universities of Makerere, Nairobi and Dar-es-Salaam.

As soon as the University of Nairobi became autonomous in 1970, it embarked on a program of expanding the existing faculties and creating new ones. By 1978, the University of Nairobi, together with its constituent college at Kenyatta had a total of ten faculties – Arts; Science; Agriculture; Commerce; Education; Law; Medicine; Veterinary medicine; Engineering; Architecture, Design and Development.

In 1978, Daniel Arap Moi Became Kenya's second president following the death of the nation's founding father, Mzee Jomo Kenyatta. Moi seemed dissatisfied with mere expansion of

the one university in existence then and sought to increase the number of public universities in response to the growing demand for higher education. In 1981, Moi formed a presidential working party on the second university in Kenya headed by Dr. Colin B. Mackay. The Mackay Report proposed the creation of a second university with a definite bias on technology and related sciences. As a result, Moi University was opened in Eldoret in 1984 to offer courses in Science and Technology.

In 1985, Kenyatta which had been a constituent college of the University of Nairobi specialising in education became a full-fledged university. In 1986, Egerton College, Njoro became a constituent college of the University of Nairobi and was elevated into a University in 1987. In 1994 Jomo Kenyatta University College of Agriculture and Technology which had been affiliated to Kenyatta University became Kenya's fifth public university.

This rapid expansion in public universities had a parallel in the private sector where private universities have also been granted charters to operate in Kenya. By 1997, there were a total of 12 private universities and colleges in Kenya offering degree courses. Most of these institutions are sponsored by churches and other religious organisations, and predictably therefore, offer mainly religious and theological courses. Only three of these institutions namely, Daystar University, the Catholic University of Eastern Africa, and the University of Eastern Africa, Baraton are accredited by the government. During the 1996/76 academic year, the three accredited private universities enrolled a total of 3,379 students of whom 52.1% were female. Thus, apart from absorbing a large number of students failing to join public universities, the private universities have an additional credit for promoting female enrolment thereby eliminating gender disparities in university education.

Table 2.4 Enrolment in Public Universities 1978-1997

YEAR	ENROLMENT			
	MEN	WOMEN	TOTAL	% OF WOMEN
1978	5,283	1,723	7,006	24.6
1979	5,871	2,103	7,974	26.4
1980	6,123	2,309	8,437	27.4
1981	6,478	2,545	9,023	28.2
1982	UNIVERSITY CLOSED			
1983	6,206	2,555	8,761	29.2
1984	6,436	2,529	8,965	28.2
1985	6,316	2,543	8,859	28.7
1986	6,904	2,847	9,751	29.2
1987*	12,205	4,741	16,946	28.0
1988	-	-	21,635	-
1989	19,454	8,118	27,572	29.4
1990	28,443	11,280	39,723	28.4
1991	-	-	41,674	-
1992	-	-	41,492	-
1993	-	-	39,571	-
1994	29,426	9,914	39,340	25.2
1995	29,488	10,577	40,065	26.4
1996	27,037	10,936	37,973	28.8
1997	30,862	12,729	43,591	29.2

Source: University of Nairobi Calendars 1980/81-1986/87, Kenyatta University Calendars 1980/81 - 1987/88, Economic Survey 1977-1997.

*Figures exclude enrolment at Egerton University totalling 1,935 students but not broken down on the basis of sex.

Table 2.4 shows that from 1978, university enrolment increased consistently and was only interrupted by the 1982 military coup attempt which led to the closure of the existing university of Nairobi. The prolonged closure of the university and the uncertainty surrounding its opening provided a fertile ground for university dropout as the impatient students sought employment or

joined other universities abroad. The dropout problem was further exacerbated by the expulsion of a number of students for their alleged involvement in the disturbances. Consequently, when the university reopened in 1983, its enrolment went down considerably. Similarly, the disturbances led to a huge backlog of unenrolled students as those who were scheduled to join the university in 1982 had to wait until it was reopened in 1983. In fact, the backlog problem persisted until 1987 when the government decided to put it to an end through a double intake which accounts for the unprecedented high enrolment in 1987. Interestingly, just when the 1987 double-intake group was passing out in 1990, the government was forced to admit yet another double-intake comprising the last group of the 7-6-3 system and the pioneers of the 8-4-4 system. As a result, the total students population in public universities increased by 44.1% in 1990.

Table 2.4 also highlights the fact that gender disparity in university education has persisted for a very long time. The number of female students joining public universities has been consistently low compared to their male counterparts. In fact, between 1978 to 1997 the percentage of female students enrolled in public universities oscillated irregularly within a range of 4.8% to settle at unimpressive 29.2% in 1997.

This deliberate expansion of university education had certain obvious merits. First, as shown in Table 2.4, the expansion enabled many Kenyans to obtain university education locally. Second, it greatly reduced the number of government sponsored students attending foreign universities, thereby saving foreign exchange. Third, the government could now afford to produce the kind of graduates that would meet her economic needs (**Bogonko 1992,143**).

However, this expansion is certainly not without limitations. First, due to rapid expansion and the resultant increase in student enrolment, the cost of running public universities have become unbearable forcing the government to introduce a system of fee payment which threatens

to make university education a preserve of the rich. Second, the expansion has led to a paradoxical situation whereby certain categories of graduates with low demand in the job market are being overproduced while high demand professions are under supplied. Third, due to expansion, the quality of graduates are being compromised in favour of quantity. The corollary to this is the frequent attack on the inability of Kenyan graduates to meet the demands of the job market. It was observed in a recent article for example that "education in this country has largely operated in isolation from the economic sector which it is supposed to serve. The result has been that its products have at times been found wanting in vital skills that has hampered their absorption into the economic mainstream" (Daily Nation, July 12, 1997,17).

2.4 EDUCATION SYSTEM IN INDEPENDENT KENYA

2.4.1 EDUCATION DURING THE KENYATTA ERA

Kenya's education system at independence did not meet the needs and aspirations of a new nation yearning for self-identity and rapid socio-economic advancement. Although the replacement of Beecher's 4-4-4 system of education with eight years of primary and four years of secondary education at the end of 1961 had greatly reduced wastages, the education provided still lagged behind Kenya's manpower needs. Furthermore, the education system inherited at independence was racially stratified and greatly tilted in favour of the Europeans and the Asians. For example, whereas compulsory primary education for European children was declared in 1909, and for Asians in 1942, Africans did not have it as late as 1963 when Kenya became independent. Each of the three races had a different school curriculum and even took different primary leaving examinations.

This situation needed urgent rectification. Consequently, on the 19th December 1963, just a week after Kenya attained her internal self government, a commission was appointed to look

into ways of improving education in Kenya. The commission named after its chairman Prof. Simeon H. Ominde commenced its work on the 15th February 1964 and was charged with the responsibility of surveying the existing education system in Kenya and to advise the government on how to design and implement national educational policies which would:

- (i) appropriately capture the aspirations and cultural values reminiscent of an independent African country;
- (ii) recognise the need for trained manpower for economic development;
- (iii) take advantage of the initiatives and services of regional local authorities and voluntary bodies;
- (iv) enhance national unity;
- (v) balance the educational needs of children with their capabilities; and
- (vi) provide for educational requirements of adults.

The Ominde Commission made several recommendations. With respect to primary education, the Ominde Report proposed that greater emphasis should be laid on numeracy, literacy and the rudiments of citizenship. To this end, the commission called for an overhaul of the Mathematics, Geography, History and English syllabuses to make them more Kenya-oriented, noting that, “the adjustment of the syllabus to the requirements of Kenya is a standing obligation” (Ominde Report 1964). The report urged for a new general science syllabus with agriculture as its integral part, leaving sufficient room for practical illustration of ideas and principles learnt in class. It further proposed that the candidates who sit for the KPE should obtain a certificate showing their results contrary to the traditional practice of issuing certificates to those who passed only.

In the field of secondary education, “the (Ominde) commission advocated for a policy to relate school output to the manpower need in the areas of trade, industry and agriculture and

further stressed the importance of the practical aspects of the subjects taught” (**Lugumba & Ssekamwa 1973,174**). As with primary education, the report suggested that all the candidates who sit for the secondary school examination should be issued with certificates.

The Ominde Report also urged for greater emphasis on technical and vocational training and encouraged the Ministry of Education to ensure planned technical education which will produce personnel matching the requirements of industry, commerce and public service. It recommended that wastage should be discouraged in the technical fields adding that students who fail to go beyond the first year in university technical education especially in engineering should be allowed to join the national polytechnics for senior technician courses.

The report discouraged rapid expansion of educational facilities without due regard for the needs of the economy and the employment situation observing that “excessive expansion of facilities and the numbers of students using them could result in the creation of unemployment among skilled personnel; a development that would be wasteful, humanly frustrating and even politically dangerous. The development of training facilities should, therefore, keep pace with general national development without overtaking it. In the same way, the types of training offered should be adjusted to changes in demand due to changing techniques of production” (**Ominde Report 1964,97**).

The Ominde Report was adopted by the government and indeed, “the report marked a watershed in Kenya’s educational history by setting a new tone appropriate to an independent African nation” (**Sheffield 1973,87**). In line with the proposal for an education system that would enhance national unity, the government through the Ministry of Education abolished the racially stratified system and replaced it with a unified national education system in January 1967. The first unified syllabus for all primary schools was prepared in the same year. Another significant change injected in primary education in 1967 was the abolition of Standard VIII and

the introduction of a seven-year primary education course. Corresponding to this change was the introduction of the Certificate of Primary Education (CPE) to be taken in Standard VII instead of the previous KPE taken in Standard VIII.

The report stimulated a remarkable expansion at all levels of education in Kenya. Between 1964 and 1968, for example, Kenya registered an average growth rate of 5.5% per annum for her primary school enrolment, with the highest growth rate of 11% per annum witnessed in 1974. This expansion was mainly due to the elimination of Primary school fees in semi-arid areas and the presidential decree of 1973 which made primary education free for the first four years of primary schools beginning from January 1974. This expansion is illustrated in Table 2.5.

Table 2.5**Enrolment and number of Primary Schools in Kenya 1963-1978**

YEAR	NO. OF SCHOOLS	ENROLMENT			PERCENTAGE OF GIRLS
		BOYS	GIRLS	TOTAL	
1963	6,058	586,724	304,829	891,553	34.2
1964	5,150	657,635	357,084	1,014,719	35.2
1965	5,078	641,103	369,786	1,010,889	36.6
1966	5,699	645,867	397,549	1,043,416	38.1
1967	5,959	689,795	443,384	1,133,179	39.1
1968	6,135	725,030	484,650	1,209,680	40.1
1969	6,111	762,827	519,470	1,282,297	40.5
1970	6,123	836,307	591,282	1,427,589	41.4
1971	6,372	881,007	644,491	1,525,498	42.2
1972	6,657	956,620	719,299	1,675,919	42.9
1973	6,932	1,025,113	790,904	1,816,017	43.6
1974	7,706	1,491,531	1,214,347	2,705,878	44.9
1975	8,161	1,561,501	1,319,654	2,881,155	45.8
1976	8,544	1,554,124	1,340,493	2,894,617	46.3
1977	8,896	1,584,800	1,386,400	2,974,849	46.6
1978	9,349	1,594,500	1,400,500	2,995,000	46.8

Source: Central Bureau of Statistics, Social Indicators: Selected data on social conditions in Kenya, 1985

Economic Surveys 1970-1980

Of interest to note in Table 2.5 above is the steady and impressive increase in girls' enrolment. Whereas female students accounted for a mere 29% in 1957, it rose to 34.2% in 1963 and then to 46.8% in 1978. To ensure that quality education is not sacrificed at the altar of rapid expansion, there was need to expand teacher training facilities so as to reduce the number of untrained teachers. In this regard, the 1966-70 Development Plan emphasised the need to reverse

the trend towards untrained teachers. As a result, the number of untrained teachers reduced drastically from 34% in 1965 to 21% in 1970.

Table 2.6

Enrolment and Number of Secondary Schools in Kenya 1963-1978

YEAR	NO. OF SCHOOLS	ENROLMENT			PERCENTAGE OF GIRLS
		BOYS	GIRLS	TOTAL	
1963	151	20,533	9,567	30,120	31.8
1964	222	25,211	10,710	35,921	29.8
1965	336	34,720	13,256	47,976	27.6
1966	400	46,802	16,391	63,193	25.9
1967	542	66,392	22,387	88,779	25.2
1968	601	75,175	26,186	101,361	25.8
1969	694	83,086	32,160	115,246	27.9
1970	783	89,327	37,528	126,855	29.6
1971	809	97,787	42,935	140,722	30.5
1972	949	111,295	50,615	161,910	31.3
1973	964	117,614	57,711	175,725	32.8
1974	1,019	128,721	67,111	195,832	34.3
1975	1,160	145,306	81,529	226,835	35.9
1976	1,268	176,723	103,665	280,388	37.0
1977	1,473	197,226	122,756	319,982	38.4
1978	1,773	216,895	144,727	361,622	40.0

Source: Central Bureau of Statistics, Social Indicators: Selected data on social conditions in

Kenya, 1985.

Economic Surveys 1970-1980.

Table 2.6 depicts a credible increase both in the number of secondary schools and the enrolment in them. The increase in the number of secondary schools throughout the 1960s and 1970s was largely a product of the self-help (Harambee) spirit which became Kenya's post-independence slogan. The Harambee spirit led to a phenomenal increase in the number of unaided secondary schools from 20 in 1960 to 483 in 1970. However, despite this impressive increase, the annual primary school turnover was still not being adequately accommodated in the existing secondary schools. Consequently a fairly distinct category of schools emerged, financed and controlled by individuals and organisations to cash in on the deficit. These schools were labelled "private schools", and together with the "Harambee schools" accounted for 49% of all secondary schools in Kenya in 1975. By 1978, the two categories of schools formed 66% of all secondary schools. Rather than building new aided schools, the government began converting some of the "Harambee schools" to government aided schools.

In terms of student enrolment, Table 2.6 reveals that during the first five years of independence, the proportion of girls as a percentage of total enrolment in secondary schools took a persistent nosedive at an average rate of 1.8% annually. This trend may have been a logical fruition of the abolition of the 4-4-4 system of education and the resultant elongation of primary education from four to eight years in 1961. This shift greatly reduced the number of female students completing primary education thereby jeopardising female enrolment in secondary schools. It is little wonder therefore, that as soon as the eight years of primary education were reduced to seven in 1967, the proportion of girls enrolling in secondary schools began to increase steadily at an average rate of 1.3% annually.

In 1964, KIE was established as a curriculum and education research centre. Since then, it has remained the sole institution responsible for the development of the various curricula, not only for the primary and secondary schools, but also for the teacher training colleges and the

post-school technical training institutions, with the exception of public universities which develop their own curricula through their respective senates. The institute prepares new and relevant curriculum materials, revises existing course content, co-ordinates programmes in teacher education, and initiates and promotes innovations and practices aimed at improving the quality of education. In the same year, English was established as a teaching medium in both primary and secondary schools. However, by 1967 it became apparent that the goals of English medium teaching were not being achieved in primary schools and so the government returned to the local vernaculars, producing a series of textbooks in vernaculars – Tujifunze Kusoma Kikwetu (TKK) for the lower primary classes.

By mid 1970s, it became apparent that the educational system had not adequately balanced the educational needs of children with their capabilities, neither had it succeeded in training manpower for national development. This realisation prompted the government to set up a committee under the chairmanship of Mr. Peter J. Gachathi to redefine the objectives of education and design a new educational policy that would integrate education with national development. The Gachathi Report of 1976 (The Report of the National Committee on Educational Objectives and Policies) proposed a revision of the secondary schools curriculum so as to emphasise practical skills, science and mathematics. It was hoped that this new emphasis on practical skills would serve to integrate secondary education with rural development. The report also noted the unequal distribution of schools among Kenyan provinces, adding that the trend would adversely affect socio-economic advancement of Kenyans. During the period 1969 to 1975 for example, central province with 15% of Kenya's population had 23% of the secondary schools, while Rift Valley with 21% of Kenya's population had only 14%.

The Kenyatta government was not very keen in increasing opportunities for university education, perhaps because of the desire to produce quality graduates who would be readily

absorbed into the job-market. Thus by 1978, Kenya had only one public university – the University of Nairobi. In terms of students population, there were 6,313 Kenyans at the University of Nairobi, 3,369 at the University of Dar-es-Salaam and 3,932 at Makerere University in 1978.

Thus, Kenyatta's education policies were geared towards correcting the imbalances created by the colonial government and re-orienting the goals of education towards the task of nation-building. As noted in the Sessional Paper No. 10 of 1965 on African Socialism and its Applications to Development, "the immediate objectives in education are to expand secondary level facilities rapidly as it was important to the training of manpower, the acceleration of Africanisation and increasing the proportion of KPE candidates that continues in education" (Republic of Kenya, 1965).

2.4.2 THE MOI ERA: 8-4-4 SYSTEM

The most significant, and perhaps revolutionary change injected into the education system during the Moi era was the introduction of the 8-4-4 system of primary, secondary and university education in 1984 to replace the previous 7-6-3 system which had been operational since 1967. The genesis of the 8-4-4 system lie in the recommendations of the 1981 Mackay Report on the second university in Kenya which placed great weight on the need for practical orientation of the entire school curriculum.

The Mackay Report which was adapted by the government in 1984 proposed the restructuring of all the three tiers of education. With respect to primary education, Mackay proposed the re-introduction of the Std.VIII class which had been abolished in 1967. Corresponding to this change was the scrapping of CPE done in Std.VII and its subsequent replacement with Kenya Certificate of Primary Education (KCPE) which would now be taken in

Std. VIII. In the secondary tier, the two-year advanced level was abolished paving way for a four-year secondary education. Consequently, both the KCE done in Form IV and the KACE taken in Form VI were abolished and replaced with the Kenya Certificate of Secondary Education (KCSE) which would now be taken in Form IV to mark the end of secondary education. From 1991, K.C.S.E. became the sole basis of admission to the university. The university education was also changed from a three-year to a four-year course.

The 8-4-4 system warmly embraced the need for practical oriented curriculum which, though not unique to the Mackay Report, formed the core of its spirit and substance. In fact, it has been observed that “one of the aims of the 8-4-4 system of education is to provide practical oriented curriculum that will offer a wide range of employment opportunities. The students graduating at every level are expected to have some scientific and practical knowledge that can be utilised for either self-employment, salaried employment or for further training. The new curriculum lays emphasis on continuous assessment as an integral part of evaluating students’ abilities and achievements” (UNESCO 1996,129).

To meet this objective, primary school children are exposed to basic practical knowledge in music, art & craft, home science and agriculture in addition to general science, mathematics, religious education and languages. The secondary school curriculum stresses the need to train and examine students in the practical aspects of subjects such as music, agriculture, home science, drawing and design, power mechanics, building, construction, art and design, electricity, metal work and wood work. In addition, students also learn physical and biological sciences, mathematics, religious education and languages. This makes the 8-4-4 curriculum broad enough and well diversified to develop and prepare students for further education and for immediate absorption into the economic mainstream.

One major strength of the 8-4-4 system of education is that it has greatly reduced wastages and made higher education accessible to many students by limiting the number of examinations one has to pass to join the university and other institutions of higher learning. This way, it has greatly stimulated enrolment in the various levels of education as shown in Tables 2.7 and 2.8

Table 2.7 Enrolment and Number of primary Schools in Kenya 1978-1997

YEAR	NO. OF SCHOOLS	ENROLMENT			PERCENTAGE OF GIRLS
		BOYS	GIRLS	TOTAL	
1978	9,349	1,594,500	1,400,500	2,995,000	46.8
1979	9,622	1,953,200	1,745,000	3,698,200	47.2
1980	10,255	2,065,400	1,866,100	3,913,500	47.7
1981	11,127	2,078,549	1,902,613	3,981,162	47.8
1982	11,497	2,178,169	2,006,433	4,184,602	48.0
1983	11,856	2,249,242	2,074,580	4,323,822	48.0
1984	12,539	2,269,240	2,110,992	4,380,232	48.2
1985	12,936	2,434,903	2,267,511	4,702,414	48.2
1986	13,392	2,512,600	2,330,900	4,843,500	48.1
1987	13,849	2,604,000	2,427,400	5,031,400	48.3
1988	14,288	2,638,500	2,485,100	5,123,600	48.5
1989	14,691	2,766,000	2,623,300	5,389,300	48.7
1990	14,864	2,766,319	2,626,000	5,392,319	48.7
1991	15,196	2,797,100	2,659,000	5,456,100	48.7
1992	15,465	2,806,800	2,723,400	5,530,200	49.3
1993	15,804	2,761,100	2,667,500	5,428,600	49.1
1994	15,906	2,814,800	2,742,000	5,556,800	49.3
1995	16,115	2,802,300	2,742,700	5,545,000	49.5
1996	16,552	2,843,400	2,754,300	5,597,700	49.2
1997*	17,080	2,880,200	2,797,100	5,677,300	49.3

Sources: Government of Kenya, Economic Surveys 1978-1998. Statistical abstracts 1979-1997. *Provisional.

Table 2.8 Enrolment and Number of Secondary Schools in Kenya 1978-1997

YEAR	NO. OF SCHOOLS	ENROLMENT			PERCENTAGE OF GIRLS
		BOYS	GIRLS	TOTAL	
1978	1,773	216,895	144,727	361,622	40.0
1979	1,721	227,734	156,655	384,389	40.8
1980	1,785	250,498	168,703	419,201	40.2
1981	1,904	242,625	167,925	410,550	40.9
1982	2,131	260,739	177,685	438,424	40.5
1983	2,230	294,160	199,550	493,710	40.4
1984	2,396	297,281	200,865	498,146	40.3
1985	2,413	270,033	167,174	437,207	38.2
1986	2,485	269,318	189,394	458,712	41.3
1987	2,592	306,044	214,217	520,261	41.2
1988	2,717	318,001	222,191	540,192	41.1
1989	2,654	383,135	257,600	640,735	40.2
1990	2,678	353,695	264,766	618,461	42.8
1991	2,647	345,788	268,373	614,161	43.7
1992	2,640	353,372	275,690	629,062	43.8
1993	2,639	295,196	236,146	531,342	44.4
1994	2,834	336,439	283,400	619,839	45.7
1995	2,878	341,807	290,581	632,388	45.9
1996	3,004	352,926	305,327	658,253	46.4
1997*	3,028	363,848	323,625	687,473	47.1

Source: Government of Kenya Economic surveys 1978-1998; statistical abstracts 1979-1997

*Provisional

Upon its implementation, the 8-4-4 curriculum requirements proved to be a burden both to the parents who had to shoulder the heavy responsibility of constructing and equipping various workshops and laboratories, and the students who found the many subjects taught a nightmare for an average mind. On their part, the teachers woke up to the fact that the time allocated was too

little for effective coverage of the curriculum. These difficulties rendered the 8-4-4 system unable to achieve its objective of imparting relevant practical skills that would stimulate self-employment and alleviate the unemployment menace.

Against this background, a presidential working party was set up to review the whole education system and man-power requirements for the remainder of the 20th century. Headed by Kamunge Mwangi, the presidential working party on education and manpower training for the next decade and beyond, presented its report in March 1988. The report recommended a review of the 8-4-4 school curriculum so as to provide adequate facilities for the teaching of science and to allow for more time to cover the curriculum content more effectively to foster the development of relevant practical skills at all levels of education.

The first KCSE results released in March 1990 proved that the architects of the 8-4-4 system were too ambitious in recommending that a candidate had to obtain a mean score of B-(minus) in ten subjects in order to secure a place in the public universities. Although about 130,000 candidates sat for the KCSE in 1989, not even half of the 9,000 new students required by the universities had attained a B-(minus) score. Similarly, although about 133,000 candidates sat for the 1990 KCSE, hardly 4,000 of them scored a mean of B- (minus), yet the universities were set to admit 10,000 freshers. In both 1989 and the 1990 cases, the university entry point had to be lowered to C+ (plus).

The other significant feature of the Moi era has been the increasingly important role played by the unaided secondary schools. While these schools accounted for 66% of all secondary schools in Kenya in 1978, by 1984, the figure had risen to 74%. Out of the 1,922 secondary schools which presented candidates for the KCE in 1986, only 500 were government schools while the remaining 1,422 were unaided (harambee and private) secondary schools. These means that the majority of the students completing secondary education passed through the

harambee and private schools and yet these schools lacked qualified teachers and were ill equipped to provide quality education.

In response to this problem, the Kamunge Report of 1988 recommended that the government should extend its assistance to the harambee schools by providing qualified teachers and adequate facilities to be able to maintain quality education. However, the Kamunge Report, like the other reports before and after it, did not address the plight of the private schools, despite the fact that these schools provide training opportunities for a large number of Kenyan students. Except for a few high-cost private schools which have remained a preserve of the rich, the majority of these schools lack basic facilities and competent teachers especially for science, mathematics and technical subjects. Thus, although private schools have increased access to secondary education, the majority of these schools offer low quality education. Rather than teaching the approved K.I.E. curriculum for secondary schools, some private schools offer foreign curricula such as the G.C.E. and G.C.S.E. whose relevance to the manpower needs of Kenya is highly contestable.

Although the completion rates have slightly improved under the 8-4-4 system, the Moi era still has to grapple with the persistent problem of school dropouts. In 1993 for example, only 45% of the 400,000 pupils who sat for the KCPE proceeded to secondary schools while a mere 6.6% of the 140,000 students who sat for the KCSE in the same year made it to the public universities (UNESCO 1996,127). The 1997-2001 Development plan estimates that only 77% of boys and 80% of girls joining Standard I enter Std IV while only 55% of boys and 35% of girls reach standard VIII. The plan targets a completion rate of 70% for both girls and boys by the end of the plan period. Since primary education has been free since 1980, the wastages in primary schools show that apart from school fees, there are more serious problems contributing to school drop out such as unwanted pregnancies, deaths and outdated traditions like early marriages.

2.5 CONCLUSION

Education in Kenya has had a long history during which it has undergone several changes and endured many problems. One of the limiting factors in the search for quality and relevant education has been lack of funds. During the colonial period, both the missionaries and the colonial government only financed the kind of education which was economically, politically and socio-culturally rewarding to them. In this regard, "since he aimed at the African soul, the missionary financed religious education. Similarly, the government and the settlers financed industrial education for Africans because they needed a local workforce to exploit the vast resources of Kenya" (Bogonko 1992,192).

The realisation by the Africans that neither mission education nor the education provided by the colonial government was in their long-term interest prompted the Africans to set up and finance their own schools, first through the independent schools movement and later through the LNCs.

Upon the attainment of independence in 1963, the goal of education changed from serving the interests of the missionaries, colonialists and settlers to that of nation building. The government joined hands with the parents and local communities as partners in financing education. The government incurred expenditures on wages and salaries while the local communities put up school buildings. In addition, parents had to pay for the education of their children until 1974 when primary school education was made free up to Std. IV. From 1980, the whole primary school education has been officially free.

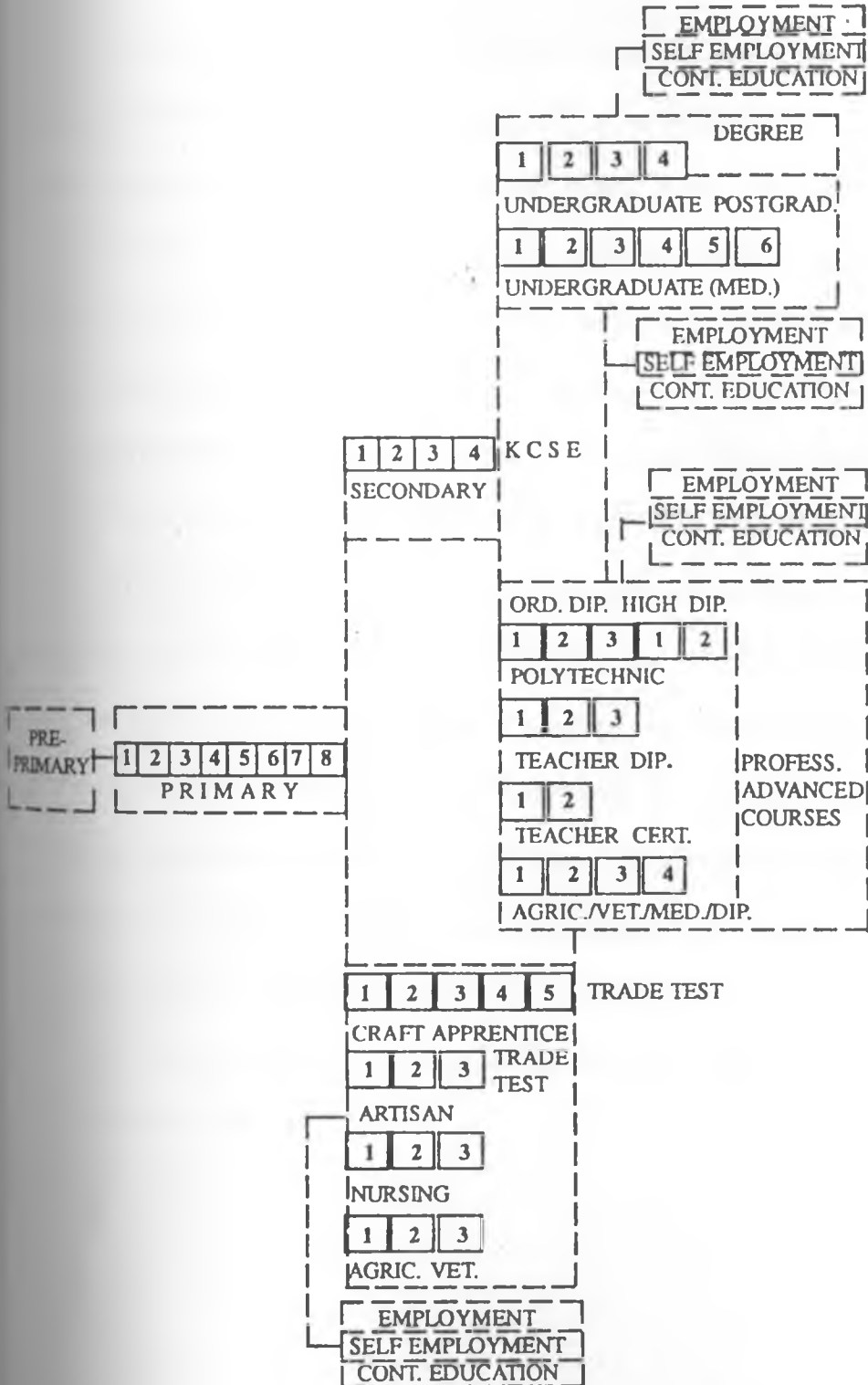
The development of the higher tiers of education was rather slow both before and after independence. The government continued playing a leading role in financing higher education, particularly post-secondary school training. Until 1974, university education in Kenya was free

but during the 1974/75 academic year the government introduced cost sharing in public universities. The cost-sharing system itself has since undergone several changes such that by 1997, a system of direct payment of fees co-existed with the government loan scheme.

Generally, since its inception in the 1840s, education has been instrumental in catalysing change in the society. Initially, it was education which was responsible for the political awakening of the Africans during the colonial period and the eventual agitation for independence. In the post-independence era, a causal link has been established between education and nation building. This has led to the search for relevant quality education and the shift in school curriculum to ensure the dissemination of relevant practical skills that match the needs of the economy.

Figure 2.1 The structure of Education in Kenya.

STRUCTURE OF EDUCATION IN KENYA



CHAPTER THREE

TECHNICAL TRAINING AND HUMAN RESOURCE DEVELOPMENT IN KENYA

3.1 INTRODUCTION

The principal objective of this chapter is to provide an accurate assessment of the extent to which technical training has been successful as an instrument for effective development of quality human resources in Kenya. In this regard, various indicators of the quality of the graduates have been identified and tested to establish whether the quality of the technical graduates from Kenyan public universities can reasonably be referred to as high or low.

The chapter begins with an outline of the objectives of technical training as expounded in official government policy documents. The aim here is to establish whether the development of quality human resources is regarded by the government as an objective of technical training. Efforts have also been made to identify the steps taken by the government to ensure that the stated objectives of technical training are achieved. The second part of the chapter is an outline of the current structure of technical training in Kenya. The emphasis here is on the various levels of technical training and the institutions offering them. Section three is an exposition of the actual role of technical training in the process of human resource development. In the final section, attempts have been made to offer a critical assessment of the quality of higher cadre technical manpower in Kenya, with specific reference to university graduates. The chapter ends with a conclusion which summarises the main issues discussed while at the same time providing a bridge to the next chapter.

3.2 AIMS AND OBJECTIVES OF TECHNICAL TRAINING

Any serious attempt to explore the role of technical training in human resource development must proceed from the stated objectives of technical training. Although technical training had been in existence for many years earlier, its objectives are more articulately presented in the official government policy paper on the 8-4-4 system of education published in 1984, and echoed in the sessional paper No.6 of 1988 on Education and Manpower Training for the Next Decade and Beyond.

According to these documents, the principal objectives of technical training are: -

- (i) to provide increased training opportunities for the increasing number of school leavers to enable them to be self supporting;
- (ii) to develop practical skills and attitudes which will lead to income generating activities in the urban and rural areas through self-employment;
- (iii) to provide practical education and training skills which are responsive and relevant to Kenya's agricultural, industrial, commercial and economic needs;
- (iv) to provide technical knowledge and vocational skills necessary to enhance the pace of national development; and
- (v) To encourage self-employment while at the same time producing skilled artisans, technicians and technologists for both the formal and informal sectors at the ratio of 1 Technologist to 5 Technicians to 10 Craftsmen.

A critical reflection on these stated objectives reveals that technical training was developed in response to three major problems related to national development. First, technical training aimed at reducing wastages in human capital resulting from non-completion of the

formal school system. This wastage has remained consistently high over a long period of time as shown in Tables 3.1 and 3.2.

Table 3.1 Number of students dropping out of the formal school system after completing primary education (1990-1997)

YEAR	No. of K.C.P.E Candidates	No. of dropouts after Primary Education	% of dropouts after Primary Education
1990	366,710	195,073	53.2
1991	366,281	190,933	52.1
1992	386,464	235,361	60.9
1993	403,468	234,554	58.1
1994	395,765	215,755	54.5
1995	393,448	210,137	53.4
1996	420,228	226,868	54.0
1997	413,983	219,411	53.0

Source: Economic surveys 1990 – 1998

Table 3.2 Number of students dropping out of the formal school system after completing secondary education (1990-1994)

YEAR	No. of K.C.S.E Candidates	No. of dropouts after Secondary Education	% of dropouts after Secondary Education
1990	133,250	123,787	92.9
1991	136,755	126,566	92.5
1992	138,702	129,487	93.4
1993	141,922	132,555	93.4
1994*	141,842	134,451	94.8

Source Economic surveys 1990-1997

*Figures do not reflect Egerton University intake which delayed.

Tables 3.1 and 3.2 confirm that the problem of wastage is serious enough. The average annual dropout rate of 55% and 93.4% for primary and secondary school leavers respectively depicted in the two tables justifies the establishment of an extensive system of technical training currently existing in Kenya. Indeed, the various technical training institutions have been able to absorb a good portion of school dropouts and transform them into employable or self-employed artisans, craftsmen and technicians. In short, technical training was developed "to reduce the mismatch between demand and supply of skilled manpower and provide skills to those who would otherwise have wished to pursue further education, and mould the attitudes of the youth towards the world of work" (UNESCO 1996,130).

Second, the emphasis on technical training has been catalysed by the desire to alleviate unemployment through self-reliance. While it is true that the problem of unemployment is not unique to Kenya, it is equally true that most countries have designed strategies to counter it. The emphasis on self-reliance is particularly important because formal employment can hardly absorb the large number of students completing school each year. In fact, as noted by Dr. Michael Omolayole, "most countries in the Commonwealth have now reached the unenviable point when the products of their educational system can no longer look forward to being easily absorbed into employment by the public and private sectors" (Report of the Tenth Commonwealth Conference 1987,78).

Self-reliance therefore remains a major goal at all levels of technical training in Kenya. In this regard, the training programs offered in the various technical training institutions are complete in themselves and equip trainees with sufficient skills to initiate and run their own income-generating ventures.

Third, technical training was meant to impart practical skills, which are relevant to the needs of agriculture, commerce and industry. The importance of this third objective of technical

training can not be gainsaid as it confirms our long held assumption that technical training was institutionalised as a mechanism for developing quality human resources. It is on the basis of this third objective of technical training that, "employers expect technical and vocational training institutions to produce graduates who possess adequate skill proficiency to achieve high productivity levels. Indeed, they expect our training programs to meet the skill requirements of the world of work" (UNESCO 1996,154).

Having defined the objectives of technical training, the government designed a plan of action to ensure that these objectives are realised. To begin with, there were plans to harmonise and rationalise the curriculum offered and certificates awarded by all technical training institutions. The curriculum was to be reformed to accentuate the role of industrial attachment and continuous assessment of students in the process of practical skill formation. In addition, the curriculum content was to be related to the needs of the economy and made flexible enough to allow constant review of courses so as to incorporate latest technological advances in the various fields. Examination and certification of the various technical programs, with the exception of programs offered at the university level, was to be centralised under the Kenya National Examinations Council, to make rating and comparison of the various certificates easy and more meaningful.

Centralisation of the examination and certifications was a very realistic response to the changes which had taken place in the formal education system. Until 1980, there were two separate bodies responsible for the setting and administration of examinations in the formal school system in Kenya. These were the examination section of the Ministry of Education and the East African Examinations Council (E.A.E.C.). The former controlled the two lower level school examinations, namely C.P.E taken in Std.VII and K.J.S.E. done in Form II, as well as the Primary School Teachers qualifying examination. The higher level examinations – Ordinary

("O") level and advanced ("A") level-were conducted by the E.A.E.C., a parastatal body created by the now defunct East African Community to run a common examination system for the three East African Countries. In 1974, Tanzania quit the EAEC but Kenya and Uganda went on with it until 1980 when, partly due to ideological divides, the council was dissolved. As a result, the Kenya National Examinations Council was created to combine the roles previously played by the EAEC and the examinations department of the Ministry of Education. Even as these changes took place, examination and certification of the technical education continued to be done by different bodies hence the need for centralisation.

Similarly, efforts were to be made to create linkages in the training programs from the village polytechnics through to the institutes of technology, to the national polytechnics and to the universities. This linkage would ensure horizontal and vertical flow of information between the various technical institutions and would encourage institutional feedback on the basis of which further rationalisation of the curriculum would be undertaken. Again, the resulting pyramidal arrangement of the technical institutions would ensure continuity for students wishing to pursue these careers to their logical conclusions. This provision for continuity is quite in tune with the UNESCO and ILO recommendation that "technical and vocational education should be so organised that every person can continue his education until his potentialities have been developed to the full" (UNESCO & ILO 1962,9).

Relatedly, the existing 15 government secondary technical schools were to be converted into post-school technical colleges so as to increase training opportunities for school leavers. In addition, the national polytechnics were to be reorganised to provide further technical education upto higher national diploma level in order to accelerate the production of middle-level technicians. It was hoped that these measures, if properly implemented, would enable the government to prepare quality human resources through technical training.

3.3 THE STRUCTURE OF TECHNICAL TRAINING IN KENYA

3.3.1 LEVELS OF TECHNICAL TRAINING

Over the years, Kenya has developed an elaborate technical training structure that offers training in a variety of occupations at different levels. Like academic education, technical training begins in primary schools where its main aim is to provide basic intellectual and practical skills in Home Science, Art and Craft, Music and Agriculture. The teaching of a wide range of technical subjects in Kenya primary schools is a unique undertaking, with no parallel in Africa. Indeed, comparative studies on technical education in Africa provides sufficient evidence to sustain the argument that "Kenya seems to be the only country that offers a wide range of technical and vocational education subjects at the primary school level" (UNESCO 1995,21).

Upon successful completion of primary education, a student can either join a secondary school or any of the myriad institutions offering certificate programmes in technical and vocational education. In secondary schools, technical education aims at preparing students for positive contribution to the society through such subjects as Agriculture, Home Science, Woodwork, Metal work, Power Mechanics, Drawing and Design, Electricity, Building construction, Art and Design, clothing and textiles as well as Aviation technology.

One of the cardinal objectives of technical education offered in secondary schools is to provide a solid foundation on which subsequent technical training can be built either in the middle colleges or in the universities. Although the number and diversity of technical subjects taught in secondary schools look impressive, the actual teaching of the subjects has been hampered by lack of qualified teachers, inadequate workshops, laboratories and equipment as well as the white collar-job mentality which has lured many students to the overcrowded academic disciplines. The Kenyan experience therefore confirms the widely held belief that "the

secondary schools in developing countries do not adequately prepare students by providing them with the skills and knowledge needed for undertaking university studies of the required level in Engineering and Science” (**International Atomic Energy Agency 1986,5**).

Table 3.1 Student enrolment in TVE Examinations at secondary school level in Kenya (1989 - 1995)

SUBJECT	1989		1990		1991		1992		1993		1994		1995	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
AVIATION TECHNOLOGY	-	-	15	-	19	-	20	-	20	-	32	-	19	-
HOME SCIENCE	2,011	10,684	1,495	9,968	1,085	9,201	722	8,914	859	9,561	831	9,998	643	9,941
AGRICULTURE	64,211	36,959	61,656	38,045	62,721	39,207	60,929	40,939	55,415	39,452	53,212	38,812	49,978	37,425
WOODWORK	2,114	112	2,207	89	2,027	75	2,105	25	2,333	41	2,199	40	1,874	35
METALWORK	700	15	642	11	586	4	643	3	711	4	674	11	642	7
BUILDING CONSTRUCTION	611	31	610	58	614	44	647	62	804	40	731	56	716	32
POWER MECHANICS	246	10	265	11	257	4	260	4	264	0	245	11	286	3
ELECTRICITY	615	32	619	12	448	27	472	29	462	24	484	46	489	23
DRAWING AND DESIGN	1,855	271	1,930	287	2,002	270	1,781	179	1,903	126	1,874	149	1,766	134
TOTAL	72,363	48,114	69,439	48,481	69,759	48,832	67,579	50,155	60,438	49,207	60,837	50,204	56,413	47,600
PERCENTAGE (%)	60	40	59	41	59	41	57	43	55	45	55	45	54	46

Source: Kenya National Examination Council (KNEC) 1994 - 1996; Statistical Abstracts 1990 - 1996.

M - Male Students

F - Female Students

Table 3.1 shows that enrolment for the various technical subjects in secondary schools seems to reinforce traditional trends which greatly affect gender balance in higher technical training institutions including the public universities. In fact, "in Kenya, close examination of girls enrolment in TVE examinations reveals a heavy traditional bias for Agriculture and Home Economics with very few enrolment in the traditionally male oriented technical areas such as building construction, power mechanics, metal work and woodwork" (UNESCO 1995,26).

Equally significant to note from Table 3.1 is the fact that the proportion of girls enrolling for the K.C.S.E. technical subjects increased by 6% between 1989 and 1995. However, this impressive increase in overall enrolment should not be misconstrued for female conquest of the male-dominated technical subjects. In fact, throughout the period under review, not even a single girl enrolled in Aviation Technology. Furthermore, female enrolment in the technical fields of power mechanics, building construction, metal work, woodwork, electricity, as well as drawing and design remained consistently low. In effect therefore, women seem to have accepted the idea that they are less physically capable and hence avoid physically strenuous and unpleasant work environment. The only explanation for the increase in overall female enrolment lies in the decline in male enrolment in subjects such as Home Science, Agriculture and Electricity.

One factor that grossly impede the promotion of technical education in the formal school system is the nature of the curriculum. While it is credited for encouraging technical education, "the 8-4-4 school curricula are overloaded with too many subjects, contents and objectives. Therefore it lacks coherence. There is also a lot of duplication of content and objectives across subjects. The introduction of practical subjects without required preparation in resources, orienting the teaching force and changing attitudes of the beneficiaries has compounded the already overloaded curricula" (Ministry of Education, 1994,69).

The other option open for primary school leavers is to enrol for the artisan courses, which constitute the first and the lowest level of technical training outside the formal school system. Artisan courses last for two years, with a curriculum comprising 90% practical work and 10% theoretical work. These courses are offered in the Youth Polytechnics, National Youth Service Training centres, Christian industrial Training centres, Rehabilitation centres, as well as other private institutions.

The second level of technical training is the craft level, which consist of three-year courses in various trades and is open to both the holders of the Artisan certificates and the secondary school leavers. The craft curriculum includes 80% practical work and 20% theoretical work in related subjects. The craft courses are taught in the Institutes of Technology, Technical Training Institutes, National Youth Service training centres and the Kenya Industrial Training Institutes.

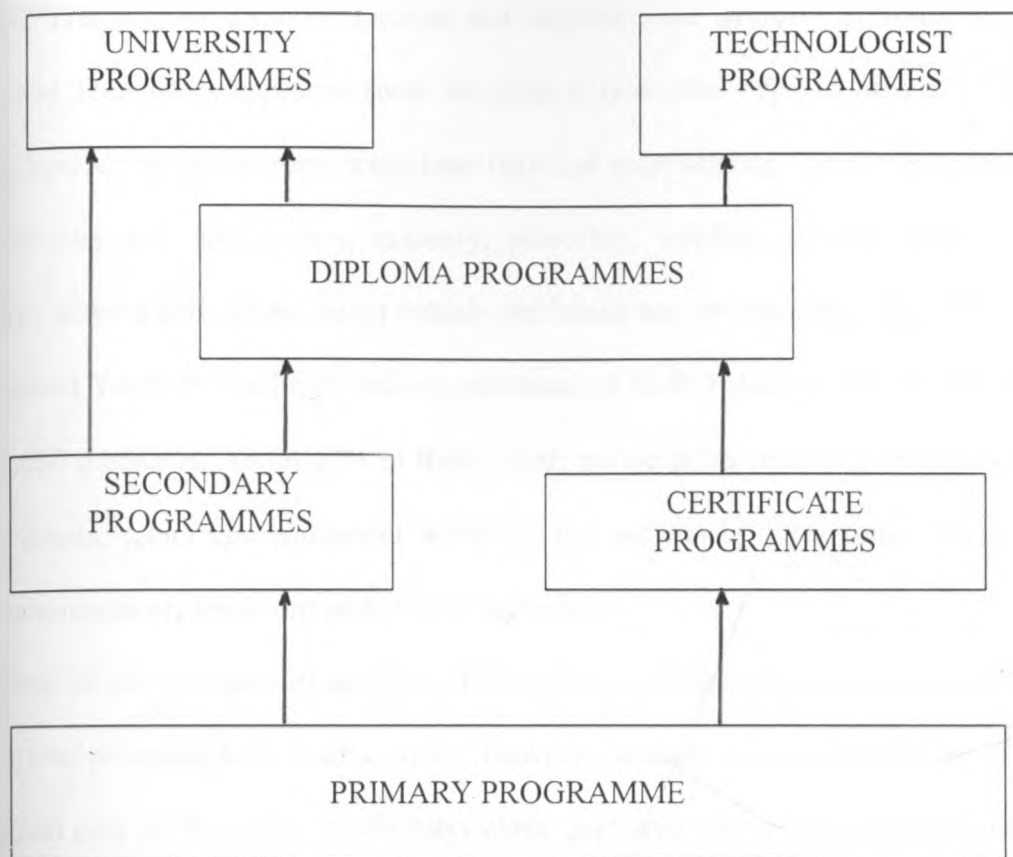
Craft certificate holders together with those who have obtained strong K.C.S.E. passes are eligible for admission into the diploma programmes which constitute the third level of technical training. The diploma courses last for three years with a curriculum emphasising 60% practical work and 40% supportive subjects. These courses are offered in the national polytechnics, Institutes of Technology, Technical Training Institutes, Universities, and Government training institutions such as the Kenya Water Institute and the Kenya Institute of Mass communication. Diploma holders can pursue the two-year higher national diploma programmes offered in the national polytechnics and the Universities. Their curriculum comprises 30% and 70% practical and theoretical work respectively.

The highest level of technical training in Kenya is the university which produces the cream of technical personnel in Architecture, Engineering, survey, Agriculture, veterinary science, Geology and Medicine. The university technical bachelor degree programmes run for

between 4-6 years, while the masters programme for the same degrees run for between 2-3 years. Bachelor degrees in the technical professions such as Geology and meteorology take four years, while Engineering and Architectural courses last for five years. Health science courses including medicine, pharmacy and dental science on the other hand, take six years with an additional one year of internship. With the exception of Health science courses such as masters of medicine which last for three years, most masters degree programmes in the technical fields and indeed, in the non-technical areas, last for two years.

UNESCO (1996) reveals a plan to introduce a two-year Bachelor of Technology course in the Kenyan Public universities for diploma holders in the 8-4-4 technical and vocational training programmes. The curriculum for this proposed technologist programme would entail 30% practical work in the area of specialisation and 70% analytical and theoretical treatment of supportive subjects. Also to be introduced is a two-year master of technology programme for the 8-4-4 first technology degree holders who would graduate into advanced technologists. When this plan becomes operational, it would be possible for a student who left the formal school system after completing primary or secondary school to find his way to the university by climbing the appropriate technical ladder.

Figure 3.1 The structure of Technical Training in Kenya under the 8-4-4 system.



Source: Government of Kenya, 8-4-4 System of Education, 1984. P.33.

3.3.2 MIDDLE LEVEL TECHNICAL AND VOCATIONAL TRAINING INSTITUTIONS

Several institutions have been set up by the government, Non-governmental Organisations, and the local communities to undertake the onus of injecting technical and vocational skills into the Kenyan youths. First, there are the Youth Polytechnics (formerly village polytechnics) which were set up to provide primary school leavers with vocational skills in trade areas such as Masonry, Carpentry, Metal work, plumbing and tailoring. Briefly stated, “the aim of the village polytechnic programme is to offer unemployed primary school leavers opportunities for training and practical experience that will improve their prospects of obtaining employment in the rural areas where they live” (Mikkelsen 1987,53).

Following the recommendations of the Sessional paper No. 6 of 1988 on "Education and Manpower Training for the Next Decade and Beyond", the Ministry of Research, Technical Training and Technology approved some 68 youth polytechnics (Yps) to offer K.I.E. developed curricula, besides the government trade tests they had been offering. These 68 Yps offer artisan courses in carpentry and joinery, masonry, plumbing, welding, garment making, electrical installation, general agriculture, motor vehicle mechanics and general fitter. By 1996, there were 600 registered Youth Polytechnics with an enrolment of 50,000 students and an annual output of about 15,000 graduates. About 63% of these youth polytechnics receive government support in terms of grants, salary and equipment while the rest are run by local communities, churches, Non-governmental organisations and private individuals.

Most of the graduates of the Youth Polytechnics join the informal sector directly while a small portion proceeds with craft courses. However, a tracer study carried out in the 1980s revealed that only 37.8% of the Youth Polytechnic graduates were self-employed during the first year of their work while the rest were in wage employment (Yambo, 1987). This means that immediate self-employment, as an objective of technical training was not being met. Lack of capital was identified as the major bottleneck hindering immediate self-employment of Youth Polytechnic graduates. Consequently, the Government set up the Kenya Youth Training and Employment Creation Project (KYTEC) to provide credit facilities for Youth Polytechnic graduates wishing to join the informal sector.

The Technical training institutes form the second set of institutions offering technical training. The history of the technical training institutes can be traced back to 1965 when the government upgraded the existing technical and trade schools at Kabete, Machakos, Kisumu, Mawego, Meru, Eldoret, Thika and Kaiboi into secondary vocational schools to provide primary school leavers with practical skills in specific trade areas alongside quality secondary education.

Around the same time, the government set up four secondary technical schools at Mombasa, Nairobi, Kisumu and Sigalagala to provide basic general technical education in subjects such as Mathematics, Mechanical drawing, science, building construction, geometrical drawing and metal work engineering. At the end of their course, students in these institutions sat for the City and Guilds and the Mechanical Engineering Craft Practice Examinations together with the ordinary level school certificate. Successful candidates were eligible for the technician courses offered at the Kenya Polytechnic and the Mombasa Technical Institute. The number of secondary technical and vocational schools increased from 12 in 1968 to 19 in 1983 while their student population rose from 3,809 to 9,500 during the same period.

From January 1986, these schools stopped admitting form one students to allow for their gradual transformation to post-primary institutions offering technical training. This transformation became complete in 1989 when the secondary technical and vocational schools were supplanted by a new set of institutions known as Technical training institutes which offer craft and technician courses in various trades. By 1996, there were 20 Technical training institutes throughout the country with a student population of 10,340 which declined to 8,553 in 1997.

The third set of technical institutions is the institutes of technology which began as Harambee Institutes of Technology (HITS). The HITS were started in the 1970s on 'harambee' basis to provide post-ordinary level craft, commercial and technical education relevant to the manpower needs of their localities. Throughout the 1970s and the early 1980s, the HITS experienced tremendous growth and expansion such that by 1982, their number had risen to ten. These include RIAT, Kirinyaga, Murang'a, Kimathi, Meru, Gusii, Sang'alo, Kaimosi, Rift valley and the WECO. Between 1982 and 1988, seven additional HITS were put up raising total enrolment from 2,443 to 4,680 students.

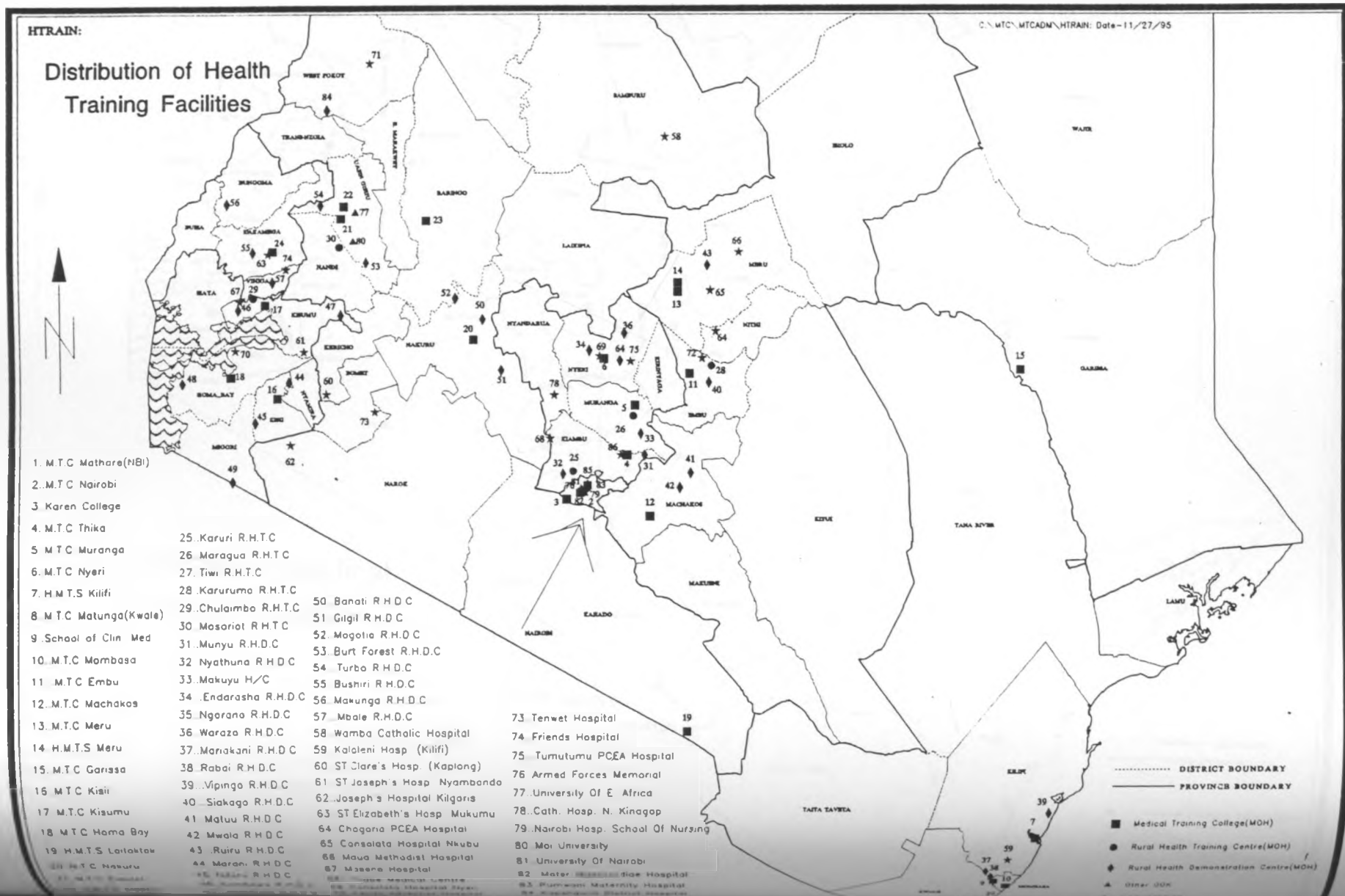
The government was quick to note the important role played by the HITS and took several measures to promote and encourage them. First, in 1978, the government increased the annual basic grants to the HITS from Ksh. 1,600/= to Ksh. 2,600/= per student enrolled, and by 1983 the government was meeting nearly 40% of their recurrent expenditures. Second, the government developed training facilities for the HITS teachers at the Kenya Science Teachers college, the Kenya Technical teachers college and the Jomo Kenyatta College of Agriculture and Technology. Third, the Government set up a committee within the Ministry of Education to coordinate and guide the HITS. Finally, the government established an examining body for the HITS. These measures aimed at improving both the quantity and the quality of education offered by the HITS.

Despite all these measures, by 1988 lack of training facilities and trained instructors remained a glaring anomaly which reduced the HITS to mere producers of crafts-men. As a result, the Kamunge Report of 1988 recommended the restructuring of the HITS to enable them prepare students for the technician and diploma certificates. Since the 'harambee' element was gradually being washed away by the government's continued involvement in the planning and financing of the HITs, these institutions were renamed Institutes of technology (ITs) and continued offering craft and diploma certificates. In 1996, there were 17 ITs catering for some 5,961 students. By 1997, enrolment in the 17 ITs had increased to 6,280.

The fourth set of technical institutions are the medical training institutions. These institutions number 86 and include 27 Government RHDCs, 26 Mission and Non-governmental institutions, 24 Medical Training Colleges, 6 Government RHTCs, 2 Public Universities (Nairobi and Moi) and one Private University (University of Eastern Africa). The geographical distribution of these institutions is shown in map 3.1. While the Medical Training Colleges constitutes a mere 27% of the total number of the institutions, they offer the bulk of the courses

and train nearly 70% of the middle-level medical personnel. Until 1994, the Kenya Medical Training college (KMTC) was administratively part of the Ministry of Health but in 1994 it was gazetted as a parastatal. It consists of the main campus in Nairobi and 23 constituent colleges distributed throughout the country as shown in map 3.2.

Map 3.1 Distribution of Health Training facilities in Kenya.



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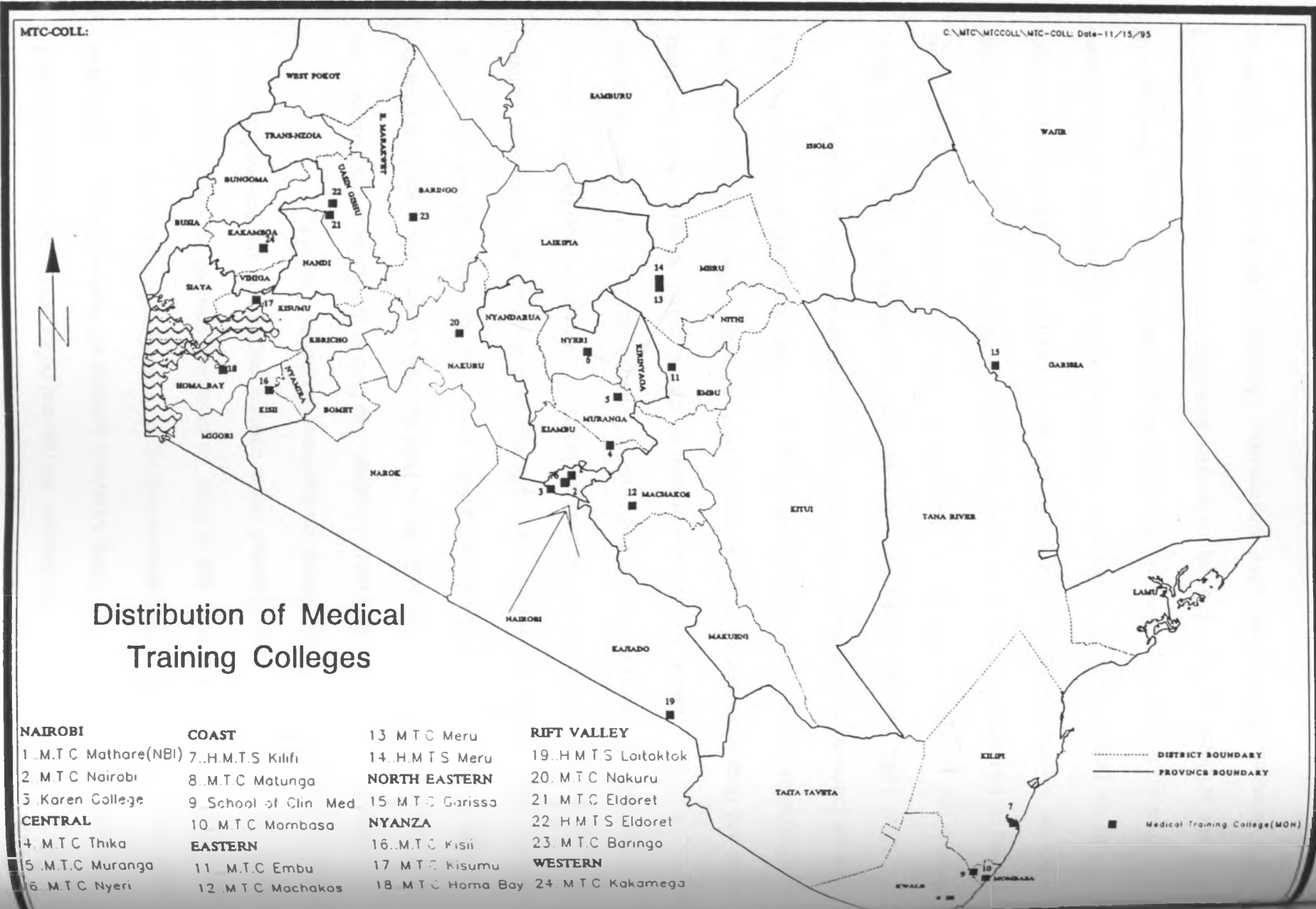
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Distribution of Health Training Facilities

- | | | |
|-------------------------|-----------------------|-------------------------------------|
| 1. M.T.C Mathare(NBI) | 25. Karuri R.H.T.C | 73. Tenwet Hospital |
| 2. M.T.C Nairobi | 26. Maragua R.H.T.C | 74. Friends Hospital |
| 3. Karen College | 27. Tiwi R.H.T.C | 75. Tumutumu PCEA Hospital |
| 4. M.T.C Thika | 28. Karurumo R.H.T.C | 76. Armed Forces Memorial |
| 5. M.T.C Muranga | 29. Chulamba R.H.T.C | 77. University Of E Africa |
| 6. M.T.C Nyeri | 30. Mosoriot R.H.T.C | 78. Cath. Hosp. N. Kinagop |
| 7. H.M.T.S Kilifi | 31. Muniyu R.H.D.C | 79. Nairobi Hosp. School Of Nursing |
| 8. M.T.C Matunga(Kwale) | 32. Nyathuna R.H.D.C | 80. Moi University |
| 9. School of Clin Med | 33. Makuyu H/C | 81. University Of Nairobi |
| 10. M.T.C Mombasa | 34. Endarasha R.H.D.C | 82. Mater Hospital |
| 11. M.T.C Embu | 35. Ngorano R.H.D.C | 83. Pumwani Maternity Hospital |
| 12. M.T.C Machakos | 36. Waraza R.H.D.C | 84. Kenyatta Hospital |
| 13. M.T.C Meru | 37. Marakani R.H.D.C | 85. Kenyatta Hospital |
| 14. H.M.T.S Meru | 38. Rabai R.H.D.C | 86. Kenyatta Hospital |
| 15. M.T.C Garissa | 39. Vipingo R.H.D.C | 87. Kenyatta Hospital |
| 16. M.T.C Kisii | 40. Siakago R.H.D.C | 88. Kenyatta Hospital |
| 17. M.T.C Kisumu | 41. Maluu R.H.D.C | 89. Kenyatta Hospital |
| 18. M.T.C Homa Bay | 42. Mwala R.H.D.C | 90. Kenyatta Hospital |
| 19. H.M.T.S Laitaku | 43. Ruiru R.H.D.C | 91. Kenyatta Hospital |
| 20. M.T.C Kisumu | 44. Maron R.H.D.C | 92. Kenyatta Hospital |
| 21. M.T.C Kisumu | 45. Maron R.H.D.C | 93. Kenyatta Hospital |
| 22. M.T.C Kisumu | 46. Maron R.H.D.C | 94. Kenyatta Hospital |
| 23. M.T.C Kisumu | 47. Maron R.H.D.C | 95. Kenyatta Hospital |
| 24. M.T.C Kisumu | 48. Maron R.H.D.C | 96. Kenyatta Hospital |
| 25. M.T.C Kisumu | 49. Maron R.H.D.C | 97. Kenyatta Hospital |
| 26. M.T.C Kisumu | 50. Maron R.H.D.C | 98. Kenyatta Hospital |
| 27. M.T.C Kisumu | 51. Maron R.H.D.C | 99. Kenyatta Hospital |
| 28. M.T.C Kisumu | 52. Maron R.H.D.C | 100. Kenyatta Hospital |
| 29. M.T.C Kisumu | 53. Maron R.H.D.C | 101. Kenyatta Hospital |
| 30. M.T.C Kisumu | 54. Maron R.H.D.C | 102. Kenyatta Hospital |
| 31. M.T.C Kisumu | 55. Maron R.H.D.C | 103. Kenyatta Hospital |
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| 45. M.T.C Kisumu | 69. Maron R.H.D.C | 117. Kenyatta Hospital |
| 46. M.T.C Kisumu | 70. Maron R.H.D.C | 118. Kenyatta Hospital |
| 47. M.T.C Kisumu | 71. Maron R.H.D.C | 119. Kenyatta Hospital |
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| 49. M.T.C Kisumu | 73. Maron R.H.D.C | 121. Kenyatta Hospital |
| 50. M.T.C Kisumu | 74. Maron R.H.D.C | 122. Kenyatta Hospital |
| 51. M.T.C Kisumu | 75. Maron R.H.D.C | 123. Kenyatta Hospital |
| 52. M.T.C Kisumu | 76. Maron R.H.D.C | 124. Kenyatta Hospital |
| 53. M.T.C Kisumu | 77. Maron R.H.D.C | 125. Kenyatta Hospital |
| 54. M.T.C Kisumu | 78. Maron R.H.D.C | 126. Kenyatta Hospital |
| 55. M.T.C Kisumu | 79. Maron R.H.D.C | 127. Kenyatta Hospital |
| 56. M.T.C Kisumu | 80. Maron R.H.D.C | 128. Kenyatta Hospital |
| 57. M.T.C Kisumu | 81. Maron R.H.D.C | 129. Kenyatta Hospital |
| 58. M.T.C Kisumu | 82. Maron R.H.D.C | 130. Kenyatta Hospital |
| 59. M.T.C Kisumu | 83. Maron R.H.D.C | 131. Kenyatta Hospital |
| 60. M.T.C Kisumu | 84. Maron R.H.D.C | 132. Kenyatta Hospital |
| 61. M.T.C Kisumu | 85. Maron R.H.D.C | 133. Kenyatta Hospital |
| 62. M.T.C Kisumu | 86. Maron R.H.D.C | 134. Kenyatta Hospital |
| 63. M.T.C Kisumu | 87. Maron R.H.D.C | 135. Kenyatta Hospital |
| 64. M.T.C Kisumu | 88. Maron R.H.D.C | 136. Kenyatta Hospital |
| 65. M.T.C Kisumu | 89. Maron R.H.D.C | 137. Kenyatta Hospital |
| 66. M.T.C Kisumu | 90. Maron R.H.D.C | 138. Kenyatta Hospital |
| 67. M.T.C Kisumu | 91. Maron R.H.D.C | 139. Kenyatta Hospital |
| 68. M.T.C Kisumu | 92. Maron R.H.D.C | 140. Kenyatta Hospital |
| 69. M.T.C Kisumu | 93. Maron R.H.D.C | 141. Kenyatta Hospital |
| 70. M.T.C Kisumu | 94. Maron R.H.D.C | 142. Kenyatta Hospital |
| 71. M.T.C Kisumu | 95. Maron R.H.D.C | 143. Kenyatta Hospital |
| 72. M.T.C Kisumu | 96. Maron R.H.D.C | 144. Kenyatta Hospital |
| 73. M.T.C Kisumu | 97. Maron R.H.D.C | 145. Kenyatta Hospital |
| 74. M.T.C Kisumu | 98. Maron R.H.D.C | 146. Kenyatta Hospital |
| 75. M.T.C Kisumu | 99. Maron R.H.D.C | 147. Kenyatta Hospital |
| 76. M.T.C Kisumu | 100. Maron R.H.D.C | 148. Kenyatta Hospital |
| 77. M.T.C Kisumu | 101. Maron R.H.D.C | 149. Kenyatta Hospital |
| 78. M.T.C Kisumu | 102. Maron R.H.D.C | 150. Kenyatta Hospital |
| 79. M.T.C Kisumu | 103. Maron R.H.D.C | 151. Kenyatta Hospital |
| 80. M.T.C Kisumu | 104. Maron R.H.D.C | 152. Kenyatta Hospital |
| 81. M.T.C Kisumu | 105. Maron R.H.D.C | 153. Kenyatta Hospital |
| 82. M.T.C Kisumu | 106. Maron R.H.D.C | 154. Kenyatta Hospital |
| 83. M.T.C Kisumu | 107. Maron R.H.D.C | 155. Kenyatta Hospital |

- DISTRICT BOUNDARY
- PROVINCE BOUNDARY
- Medical Training College(MDH)
- Rural Health Training Centre(MHC)
- ◆ Rural Health Demonstration Centre(MHD)
- ▲ Other OHC

Map 3.2 Distribution of Medical Training Colleges in Kenya,



The fifth set of technical institutions are the national polytechnics which were established to train middle level technicians. In 1949, Mombasa Institute of Muslim Education was built at the coast to provide technical and vocational training to all Muslim students in East Africa. The institute had its first intake in 1951 and in 1966, its name was changed to Mombasa technical institute. Six years later, it was upgraded into a national polytechnic and renamed Mombasa Polytechnic. It specialised in Engineering, management and Business studies.

Similarly, in 1959, Nairobi technical institute was built to provide basic craft courses. In 1961, it was renamed Kenya Polytechnic. From 1966 the craft courses were phased out from the polytechnic following the introduction of similar courses in the vocational schools and the secondary technical schools. It then began offering more advanced technician and diploma courses. In addition, Kenya Polytechnic offered studies for trainees and apprentices in industry and commerce and prepared students for higher education, including university education. It also acted as an advisory centre for the development of the secondary technical and vocational schools, and from 1968, trained technical teachers for these schools. Since the graduates of the Kenya Polytechnic were in very high demand, they were readily employed after graduation and given strict follow-up by their instructors to see how they progressed in their places of work.

Until 1980, the two polytechnics only admitted students sponsored by private firms, parastatals and government institutions. However, the Mackay Report of 1981 proposed the scrapping of this admission policy in favour of a more liberal policy that would allow other students not specifically attached to employers to take advantage of the training opportunities offered by the polytechnics. The adaptation of this liberal policy greatly catalysed the demand for polytechnic training opportunities, prompting the government to set up a third national polytechnic in Eldoret in 1987. The national polytechnics offer certificate and diploma courses in Applied Sciences, Building and Civil Engineering, Mechanical and Electrical Engineering.

Surveying and Mapping, Chemical Process Technology, Medical Engineering, and Computer Sciences among others. By 1996, the three national polytechnics had a combined student enrolment of 8,649 students which rose to 8,658 in 1997.

The list of the institutions offering technical training in Kenya cannot possibly be exhausted in a study of this nature. However, table 3.2 provides a list of the most salient middle-level technical training institutions in Kenya.

Table 3.2 Middle-level Technical Colleges in Kenya – 1998

Category of College	Number of Colleges	Level of Training
National Polytechnics	3	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma • Higher Diploma
Institutes of Technology	17	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma
Technical Training Institutes	20	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma
Kenya medical Training Colleges	24	<ul style="list-style-type: none"> • Basic Certificate • Post-Basic Certificate • Ordinary Diploma • Higher Diploma
Agricultural Training Institutions	8	<ul style="list-style-type: none"> • Vocational (Short-term) • Certificate • Diploma
Kenya Institute of Mass Communication	1	<ul style="list-style-type: none"> • Certificate • Diploma
Kenya College of Communications Technology	1	<ul style="list-style-type: none"> • Certificate • Diploma
Kenya Institute of Surveying and Mapping	1	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma • Higher Diploma
The Institute for Meteorological Training and Research	1	<ul style="list-style-type: none"> • In-service (6 months) • Certificate • Ordinary Diploma • Advanced Diploma
Utalii College	1	<ul style="list-style-type: none"> • In-service (short term) • Certificate • Ordinary Diploma

Category of College	Number of Colleges	Level of Training
Civil Aviation Training School	1	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma • Higher Diploma
Kenya Science Teachers College	1	<ul style="list-style-type: none"> • Diploma
Kenya Technical Teachers College	1	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma
Railway Training Institute	1	<ul style="list-style-type: none"> • Basic Certificate • Advanced Certificate • Ordinary Diploma
Kenya Water Institute	1	<ul style="list-style-type: none"> • In-service (Short-term) • Certificate • Ordinary Diploma • Higher Diploma
Bandari Training College	1	<ul style="list-style-type: none"> • Basic Certificate • Advanced Certificate • Ordinary Diploma
Forestry Training School, Londiani	1	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma
Naivasha Wildlife and Fisheries Training Institute	1	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma
Nairobi Institute of Technology	1	<ul style="list-style-type: none"> • Certificate • Ordinary Diploma

Sources: Ministry of Research and Technical Training and relevant publications by the various institutions.

3.3.3 TECHNICAL TRAINING IN PUBLIC UNIVERSITIES

Technical training has remained a major component of university education in Kenya since the days of the RTC. Indeed, upon its completion in 1956, the RTC was opened as a middle-level technical college offering diploma courses in Engineering, Domestic Science and Agriculture. Additional technical courses were later introduced in the 1960s and the 1970s.

One of the technical skill areas which have received considerable attention since the 1950s is engineering. In fact, "Engineering was one of the six founding departments when the Royal technical college of East Africa first opened its doors to students in April 1956" (McNown 1977, 49). Until 1961, the department of engineering offered five-year diploma courses in

civil, electrical and mechanical engineering for the ordinary level certificate holders. It was planned that upon successful completion of these courses, the trainees would be eligible for corporate membership in Engineering institutions in the United Kingdom. During the 1957/58 academic year, a separate department of survey was created to offer training in valuation, building, as well as quantity and land survey in accordance with the syllabus of the Royal Institute of Chartered Surveyors.

When the RTC was upgraded into a university college in 1961, the Department of Engineering was elevated into a faculty and immediately entered into a special relationship with the University of London for degree awarding purposes. The Faculty of Engineering began preparing students for Bachelor of Science degree of the University of London in three separate departments of Mechanical, Civil and Electrical Engineering. The course duration remained five years with the first two years being common to the three departments. The two-year common courses were later scrapped, thereby enabling each of the three departments to run autonomous three-year degree programmes. However with the introduction of the 8-4-4 system of education, the course duration was elongated once more to five years.

Earlier, in 1967, Architectural courses were divorced from the expansive faculty of arts to the newly created faculty of Architecture, Design and Development. This new Faculty linked up with that of Engineering to form the present College of Architecture and Engineering of the University of Nairobi. Currently, the college offers degree courses in agricultural engineering, civil engineering, mechanical engineering, surveying, architecture, electrical and electronic engineering, building economics and management, design, land development, as well as urban and regional planning. In addition, the college has three service units – the Institute of Nuclear Science, Industrial Research and Consultancy Unit, and the Housing Research Development Unit.

The other technical skill area which has had a long history is that of Agriculture and Veterinary Sciences. The foundation for the present college of Agriculture and Veterinary Science was laid in 1962 when the Faculty of Veterinary Medicine was transferred from Makerere University College to the then Royal College, Nairobi. During the 1970/71 academic year, the Faculty of Agriculture formally came into existence and admitted its first 41 students in the departments of Agricultural Economics, Applied Plant Sciences, Crop Production, Entomology and Soil Science. The faculty of Agriculture teamed up with that of Veterinary Medicine to form the College of Agriculture and Veterinary Sciences. On 1st July 1974, the two departments of Applied Plant Sciences, and Crop Production were merged into the new department of Crop Science. At the same time, the department of Food Science and Technology (now Food Technology and Nutrition) and that of Agricultural Machination and farm planning (now Agricultural Engineering) were established.

During the 1978/79 session, a new department of Forestry was created. However, in September 1983, the department was transferred to Moi University. In 1995, the Institute of Dry Land Research Development and Utilisation was set up to undertake appropriate research and develop academic programmes for sustainable utilisation of dry lands. Presently, the college provide training in Agricultural Economics, Crop Science, Soil Science, Food Technology and Nutrition. Agricultural Engineering, Range Management, Animal Production, Animal Physiology, Clinical Studies, Veterinary Anatomy, Veterinary Pathology and Microbiology, Biochemistry, as well as Public Health, Pharmacology and Toxicology. The College also has a 300-acre field station at Kibwezi as well as clinics and laboratories.

Health sciences too have been part of the university technical education since the 1960s. The Faculty of Medicine was officially inaugurated on the 7th March 1968. The first group of eight nurse teachers obtained diplomas in June 1970, while the first group of doctors graduated in

April 1972. In 1974, two additional departments were established within the faculty of medicine. These were the departments of Dental Surgery and Pharmacy. However, in 1995 these two departments were elevated into faculties. Thus, from 1995, the college of health sciences of the University of Nairobi has had three faculties with a total of twenty-five departments.

The university technical training programme has also focused on biological and physical sciences. The faculty of science is as old as the university itself and has continued to provide training in geology, meteorology, zoology, botany, biology, physics, chemistry, bio-chemistry and mathematics. While not all the courses offered within the faculty of science merit being referred to as technical courses, meteorology certainly does, since it involves practical application of pure science and mathematics. In fact, "meteorology is a multi-disciplinary science requiring basic knowledge of mathematics (pure and applied), physics, chemistry, geography, agriculture, hydrology, aviation, etc. Application of statistics, including time series analysis, are of continuous use in meteorology" (Khamala 1978, 208).

The 1980s and early 1990s witnessed efforts by the government to expand technical training through the creation of more public universities with technical orientation. As part of this expansion of technical education at the university level, Moi University was opened in Eldoret in 1984 to offer courses in science and technology. By 1988, Moi University had developed three main technical faculties – Forest Resources and Wildlife management, Science Technology, and Development Studies.

These developments were followed by the establishment of Egerton University in 1987. Egerton started as an exclusively European agricultural school in 1939, with a grant of 320 hectares of land from Lord Egerton. In 1950, its role expanded to include training of personnel and staff for agricultural research and extension services, but it remained a purely European institution throughout the colonial period. After independence, the school was handed over to the

government of Kenya and in 1978, it received a five-year development grant from USAID for further expansion of its physical facilities in order to increase its capacity. Egerton College was upgraded into a university college affiliated to the University of Nairobi on 30th July 1986, and assumed full university status in 1987.

In 1981, Jomo Kenyatta College of Agriculture and Technology was established as a middle-level institution specialising in agriculture and engineering training programmes. Upto 1988, the college offered diploma courses in horticulture, food processing technology, and agricultural engineering as well as technician courses in mechanical engineering, electrical and electronic engineering, and irrigation. In 1988, it became a university college affiliated to Kenyatta University and was renamed Jomo Kenyatta University College of Agriculture and Technology (JKUCAT). Thereafter, most of the diploma programmes were gradually transformed into degree courses. In 1994, JKUCAT graduated into a full university and its name was changed once more to Jomo Kenyatta University of Agriculture and Technology (JKUAT).

Generally, the university technical curriculum consists of 30% practical work in the main technical area and 70% analytical and theoretical treatment of supportive subjects. It is a rigorous training encompassing a wide assortment of mandatory practical work, including either fieldwork or clinical work or industrial attachment, depending on the specific requirements of each profession. For the professions requiring industrial attachment, the recommended attachment duration for the university technologist programmes is six months, compared to nine months for the craft and technician courses, and three months for the artisan courses (UNESCO 1996, 148).

In most technical fields, successful completion of university education is a necessary but by no means a sufficient condition for initiation into the profession. In addition, one is required to acquire some practical experience under the guidance of more established professional

colleagues. In some cases, one is also required to pass professional examinations before being registered into the profession. In this regard, nearly all technical skill areas have at least one professional body that register newly qualified members. An engineering graduate for example, remains a titular member of the profession until he is registered by the Institution of Engineers of Kenya and the Engineering Registration Board. This registration follows a satisfactory assessment of one's education and subsequent training by an official panel of professional engineers. A graduate is usually required to work under more experienced colleagues for at least three years so as to receive practical training and gain suitable experience before being registered. During this period, the employer is required to give the young engineer the opportunity and facilities, under guidance and supervision which will enable him to pass his professional examinations. However, it should be noted that "although the government has set up a mechanism for registering engineers, it has not set up regulations ensuring that graduates do, in fact get an adequate practical training" (Fishwick 1983,102).

In the field of medicine, the stipulations are even more stringent. The training of medical doctors both at the under-graduate and the post-graduate levels take the longest duration of six and three years respectively. During the conferment of degrees, the medical graduands are required to take the Oath of Hippocrates (the founder of modern medicine), undertaking among other things, to respect the sanctity of human life. The fresh medical graduates have to complete one year of internship in a large government medical institution, preferably the provincial hospitals, before they can apply for registration with the Medical Practitioners and Dentist Board. This registration merely confirms their new status as medical officers of health but does not in anyway authorise them to undertake private practices. Furthermore, holders of bachelors degree in medicine remain general practitioners regardless of their experience or standing in the society

until they obtain at least a master's degree and become specialists in one of the myriad branches of medicine (Shwarz 1996).

3.4 THE ROLE OF TECHNICAL TRAINING IN HUMAN RESOURCE

DEVELOPMENT

The process of human resource development is a complex equation consisting of an input side and an output side. On the input side are all those institutional frameworks within which the human person acquires knowledge, skills, attitudes and values with a direct bearing to some anticipated task to be undertaken. In other words, it is in the input side where the human person as a resource factor obtain the inputs which, if properly internalised should enable him perform relevant tasks in the actual work environment. The output side refer to those institutional set ups within which the internalised inputs can be translated into outputs defined as the quantity or quality of work performance. The input side therefore consists of the training institutions while the output side comprises the employing institutions.

The two sides of the equation are linked through a filtering process which selectively allows input-holders (trained manpower) to pass through and give their outputs in the relevant work stations. This filtering process which is also referred to as man-power selection, recruitment and placement, ensures that only those with proven ability to transform the acquired inputs into quality outputs enter the work environment. The quality of the outputs given by the trained manpower in their respective work stations will solicit some response from the employers to the trainers in the form of support or demands. The response is channeled through established feedback loops and, together with fresh demands and support, are re-processed and refined by the

training institutions to produce relevant input package for the trainees, and the process repeats itself.

In a state of equilibrium depicted by the above recapitulation on the input – output model, the process of human resource development is characterized by a number of features. First, the training institutions feed the trainees with inputs which are relevant to the needs of the employing institutions. Put differently, the knowledge, skills and attitudes acquired through training directly correspond to those required by the employing institutions. Second, there exists a water tight system of evaluating the trainees' successful internalization of the acquired skills to ensure that the final products of the training institutions have mastered the skills learnt and are therefore able and ready to translate them into quality outputs. Third, manpower selection, recruitment and placement is strictly pegged on merit since non-merit values are known to distort the job market and encourage manpower displacement whereby graduates end up in odd jobs despite their skills. Finally, there is a continuous interaction between the trainers and the employers who tend to develop a supplier consumer relationship. As it has been allegorically put, "a satisfactory relationship is fostered when a supplier understand fully the needs of his customers and when the buyers are aware of the constraints within which the supplier has to operate" (Fishwick 1983,12).

As a major component of the input side, technical training in public universities involves three key processes with direct bearing on the quality of technical graduates:

- (i) Input identification and aggregation;
- (ii) Input dissemination: and
- (iii) Input assessment.

Input identification and aggregation as used here denote the process of deciding the knowledge, skills and attitudes which need to be imparted to the trainees in the light of the roles they are expected to play after their training. In other word, it refers to the process of curriculum

development, where curriculum is defined as “all that is planned to enable the students acquire and develop the desired knowledge, skills and attitudes” (Oluoch 1982,7).

While the various technical programs offered by the lower and middle-level institutions are prepared by the K.I.E, each university develops its own curriculum through their respective university senates which consists of the Vice Chancellor, the deputy vice-chancellors, college principals, deans of faculties and directors of institutes, departmental heads, faculty board nominees, the University Librarian and students representatives. This arrangement is however, paradoxical in at least two ways. First, the university senate is expected to match the curriculum content with the needs and aspirations of the Professions in the field and yet, the employers in the various professions have no representatives in the senate.

This contrasts sharply with curriculum development in the lower and middle-level technical training institutions. Although K.I.E is the sole body charged with the responsibility of developing curricula for all the lower-level and middle-level technical institutions, the representatives of the industrial and commercial sectors sit in the various K.I.E. curriculum development panels and boards to ensure that the needs and aspirations of the industries are adequately accommodated and reflected in each technical syllabus. This way, the middle-level technical training institutions provide the industrial and commercial sectors with qualified and technologically relevant manpower. The only problem is that the needs of the enterprises are so diverse that it is doubtful whether those who sit on the K.I.E. curriculum development panels and boards adequately represent the needs and aspirations of the entire industry. This is more so because “ industry comprises of many enterprises and departments with diverse technical operations and objectives, and with a corresponding multiplicity of needs” (Fishwick 1983,13).

Second, the curriculum offered by the various universities are the products of their respective senates and predictably therefore, differ from each other and yet, the public

universities are expected to produce equally competent graduates. In short, the way the curriculum offered in public universities is developed has a potentially disruptive effect on the overall development of higher cadre technical manpower.

Having identified and aggregated knowledge skills, and attitudes, there is need to transmit them to the trainees in the most efficient and effective way. This process of transmission is what we have referred to as input dissemination. Simply stated, input dissemination is the totality of the actual learning experiences of the trainee, including classwork, workshop and laboratory experiments, field demonstrations, as well as industrial and clinical attachments. Obviously, the way the process of input dissemination is organized and carried out by public universities has a great bearing on the quality of the graduates they eventually produce.

The universities therefore, need to ensure certain minimum conditions for effective input dissemination. To begin with, appropriate balance has to be maintained between theoretical treatment of the subjects taught and practical demonstration of the theories learnt. Relatedly, the curriculum content should be precise and manageable within the time schedule stipulated. This is vital because non-completion of the syllabus deprives the students of certain vital knowledge and skills. Furthermore, "when curriculum become overloaded there is a grave risk of falling standards which would be a very serious threat" (**Government of Kenya, 1991, 165**). Finally, the students' attitude towards practical work should be carefully moulded and refined to enable them appreciate its value.

The task of input dissemination is however shared between the university as a training institution and the industry on the basis of comparative advantage. For example, it has been observed that "proper training and education of an engineer is a life long process which involves acquisition of both theoretical knowledge and practical skills. While theoretical knowledge may

best be acquired inside the walls of an institution, industry provides the best setting for acquiring practical skills” (**Journal of Engineering 1978, 11**).

The need to integrate classroom education with practical experience is however, not limited to engineering but cuts across the entire technical training spectrum. This calls for greater collaboration between the training institutions and the employing institutions. In fact, effective development of quality human resources through technical training depends on the strength of the link between technical training institutions and the enterprises which absorb technical graduates. It is important to note at this point that “the ultimate goal of technical and vocational education is to prepare individuals for the actual professional work. In order for technical and vocational education to be relevant it must be closely linked to enterprises so that its graduates will find it easier to move from education to the work environment”(**UNESCO 1995,30**).

One area of co-operation critical for the development of technically skilled manpower is that of industrial attachment which enables the trainees to understand and appreciate the complete demands of the work environment. Fortunately, the 8-4-4 system of education within which the present technical training framework is embedded” emphasize practical aspects of training and includes mandatory industrial attachment at all levels” (**UNESCO 1996, 148**).

However, industrial attachment is devoid of meaning unless there is an appropriate mechanism of evaluating the trainees learning progress when on attachment. Such evaluation would be vital in strengthening and improving the teaching of technical subjects particularly at the university level. In this regard, it is incumbent upon the entrepreneurs to readily accommodate trainees during their industrial attachment and to assign them jobs commensurate with their professions and levels of training. The trainees on their part are obliged to develop the right attitude towards industrial attachment as a continuation of their training rather than a break from routine class work and an opportunity to make money.

The other area where a marriage of convenience has to be facilitated between the technical training institutions and the enterprises is in the financing of technical training. It needs to be emphasized here that, "properly planned and run technical education can be very expensive in that it needs many different categories of tools and equipment. The maintenance of equipment is equally expensive. It is capital intensive investment"(Bogonko 1992, 167-168).

Lack of finance can seriously frustrate the search for quality human resources. Acting on this precept, the government designed a cost-sharing scheme to ensure that the enterprises, being the beneficiaries of the training process, also contribute towards the financing of technical education. More precisely, "the purpose of cost-sharing between the government, the communities, parents and the beneficiaries of education and training is to raise additional funds, accelerate the expansion of education and training opportunities and therefore increase access to education and training at all levels and to ensure their quality and relevance" (UNESCO 1996, 161).

While the government has been and continues to be the principal source of funding for education and training programs including technical training, the churches, NGOs and certain private individuals have also committed huge finances in funding and erecting the infrastructure and meeting the running cost of a large number of private technical institutions. The donors too have made a substantial contribution to the development of technical training programs by providing physical facilities, equipment and tools as well as staff development and training materials. The contribution of the enterprises to technical training is done mainly through the industrial training levy fund which was created in 1971 for the maintenance and upgrading of equipment in technical institutions. The fund is organised in such a way that those enterprises which in addition to contributing to it also provide training, are entitled to a refund. However, recent studies have revealed that "Industrial training levy funds are not used for the maintenance

and upgrading of equipment. This constrains the ability of training institutions to keep pace with changing technologies” (Government of Kenya 1997,142).

The partnership between technical institutions and the enterprises is particularly vital because it leads to a symbiotic relationship whereby technical training institutions obtain funds from the enterprises to purchase and maintain modern tools and equipment with which they undertake industrial research on new technology. The new technology developed is then used by the enterprises to stimulate industrial growth and development. This symbiotic relationship has the advantage of preventing technical education from becoming esoteric and far removed from current practices and needs, thereby improving the quality of human resources while at the same time enhancing industrial efficiency. However, available evidence on technical training in Kenya indicate that “there is little co-ordination between industry and training institutions leading to poorly planned and supervised industrial attachments...” (Government of Kenya 1997,142).

Input assessment defined as the process of measuring satisfactory internalization of acquired knowledge, skills and attitudes is the third significant step in the process of human resource development which is undertaken by the public universities as training institutions. It refers to the entire examination and certification network through which the chuff is separated from the grain with respect to qualified and unqualified manpower. Not only does examination measure levels of competence but it also influence skill-formation. Indeed, “since most students want to succeed at school, what the assessment of their learning consists of will virtually determine learning activities they undertake, especially as the assessment period draws near. Those learning activities which are closely connected with what is included in the assessment are undertaken enthusiastically, and those which are only remotely linked with what goes into the assessment package are hardly undertaken”(Oluoch 1982,9).

An efficient and effective examination system, first and foremost, should consist of regular continuous assessment. In this regard, "continuous assessment may be viewed as a formative evaluation procedure concerned with finding out, in a systematic manner, the over-all gains that a student has made in terms of knowledge, attitudes and skills after a given set of learning experiences" (Ogunniyi 1984, 113). The importance of such regular assessment is that it reflects progress made at various stages in the long process of training. Indeed "a system of continuous assessment would very much encourage the student to spread his efforts sincerely throughout the year, thereby enabling him to learn to work consistently" (Khamala 1978, 51).

It has been argued for example, that a three hour paper cannot provide an adequate coverage of a year or semester's work as it is open to a strong element of chance which can have considerable effect on individual scores. For example, a student may be indisposed on the examination day or even freeze under the tension, given the importance of the occasion. Thus, in the absence of a system of continuous assessment, "all sorts of variables enter to make the examination marks a rather unreliable measure of student ability, and no amount of internal or external assessment and reassessment of a paper written in these circumstances can improve its reliability as a measure of student's potential" (Mc Nown 1970, 118).

From the foregoing, it is evident that technical training plays a pivotal role in the development of human resources. In fact, "most countries have recognised that a pool of skilled manpower in essential sectors like agriculture, construction, manufacturing, transportation, communication and commerce, for example, is critical to national development. It is through technical and vocational education and training that such manpower can be obtained" (UNESCO 1995, 12).

3.5 TECHNICAL GRADUATES IN KENYA: A QUALITATIVE APPRAISAL

3.5.1 PRELIMINARY OBSERVATIONS

It has already been shown that the quest for quality manpower is one of the cardinal objectives of technical training in Kenya. What need to be emphasised at this point is the fact that the quality of a graduate is measured in terms of his ability to perform efficiently and effectively duties relevant to his profession and commensurate with his level of training. Having been thoroughly trained, examined and certified competent, a graduate in any of the technical professions is expected to be able to handle a suitable job in his area of specialisation with much ease. unless of course, there is a mismatch between the knowledge and skills acquired through university education and those required in the actual work environment.

3.5.2 QUALITATIVE ASSESSMENT FROM THE INPUT SIDE

The lecturers, being the principal actors in the input side of the human resource development equation, were asked whether they think their departments or faculties have succeeded in producing high quality graduates. Their response is shown in table 3.3:-

Table 3.3 Lecturers' assessment of graduate quality

HAS YOUR DEPARTMENT SUCCEEDED IN PRODUCING HIGH QUALITY GRADUATES?		
RESPONSE	FREQUENCY	PERCENTAGE
YES	10	50%
NO	9	45%
DON'T KNOW	1	5%
TOTAL	20	100%

While table 3.3 reflects a larger proportion of the lecturers (50%) confirming that their respective departments have succeeded in producing high quality graduates, it is not lost to us that an equally significant proportion of the lecturers (45%) gave a negative response. Given the weight of the question raised, the intricate response scenario depicted in table 3.3 can only be interpreted by taking recourse to a supplementary question which required the lecturers to provide an explanation as to why they thought their departments produce high or low quality graduates. The purpose of this supplementary question is to establish the criteria used by the lecturers to evaluate the quality of their graduates and to determine whether their criteria is tenable or not.

Let us begin by looking at the criteria used by the ten lecturers who felt that the quality of graduates is high. Thirty per cent of the lecturers who assessed the quality of the graduates to be high, which represents 15% of the total number of lecturers interviewed, based their judgement on the fact that the efficiency of their graduates has never been disputed. Their argument is that since no one, not even the employers, has ever questioned the efficiency of their graduates, the graduates must be of high quality. This criterion is faulty in two ways. First, assuming that the quality of technical graduates has never been disputed, to jump from the premise that nobody has ever questioned the efficiency of the graduates, to the conclusion that their quality is high, is to engage in fallacious reasoning. That the quality of the graduates has never been disputed may be a result of lack of appropriate channels through which the employers can relay their dissatisfaction to the trainers.

If this first objection is purely a matter of logic, the second objection is a product of empirical evidence. Contrary to the position adopted by these lecturers, a lot of concern has been voiced on the quality of nearly all cadres of technical graduates. Indeed, studies carried out on the status of technical manpower in Kenya, including the most recent one undertaken by the

Directorate of Industrial Training in 1995 have revealed the startling failure of technical institutions, including public universities, to produce credible technical personnel. The running thread throughout these studies is the feeling that human resource development has not been properly planned and integrated with the needs of the economy, resulting into the production of technical personnel with little relevance to the needs of their professions. The 1997-2001 development plan for example, has shown that technical graduates lack hands-on experience, have poor work attitude and are generally inflexible. This means that although industrial attachment has been made compulsory at all levels of technical training, it does not seem to have achieved its twin objectives of providing the trainees with hands-on experience and enabling them to appreciate the work environment.

With respect to engineering education, it has been observed that “the formal education of the engineer has followed essentially the same pattern throughout the ages. If there is any difference at all, it is that engineering is becoming more and more theoretical and less and less practical. The result is that when graduate engineers leave the universities for employment in government or industry, they become disillusioned, and many employers are also dissatisfied with the abilities of their newly qualified employees” (Mc Nown 1970,101).

The voice of discontent has not spared the quality of the various shades of scientists, including Meteorologists and Food technologists. In fact, “serious criticism has been voiced against current science education. It is alleged that much of it fails to ensure broad and deep understanding of science or to inculcate a scientific attitude; that current methods of scientific teaching concentrate too much upon abstract principles; that it is not uncommon for teachers (not least because of their lack of practice as scientists) to fall into the pattern of trying to teach science in a way that is untrue to the nature of science” (Khamala 1978, 47). The 1997 – 2001

Development plan has revisited the problems bedeviling science education, noting that "poor facilities in science teaching and the obsolescence of much equipment undermine the quality of education at this (university) level" (**Government of Kenya 1997,141**). To expect the quality of graduates produced under these circumstances to be high is to expect too much out of too little.

Graduates in the medical fields have also received their fair share of criticism. It has been argued that university education in Kenya has only succeeded in producing medical doctors who are good in certain aspects of medical practice but wanting in others. In this regard, one scholar has observed that "The public investment in the education of doctors has not been linked to a strategy that distributes the benefits to all regions and sectors of the society. The training of physicians at the University of Nairobi neither motivates nor prepares them for careers in community medicine, public health, Health service management or rural practice" (**Shwarz 1996**).

It is evident from the foregoing that the lecturers' contention that the quality of their graduates has never been disputed is not tenable. This is more so because all the three lecturers who expressed this view were from the departments for which we have presented evidence of criticism.

Similarly, another group of three lecturers representing thirty per cent of the lecturers who assessed the quality of the graduates to be high, or 15% of the total number of lecturers interviewed, used the rate at which their graduates are being employed after graduation as a criterion for determining their quality. For them, the fact that their graduates are almost immediately employed after graduation is an indicator that they are of high quality. The three lecturers were drawn from the departments of Meteorology, Medicine and Food science and

technology. While it is true that graduates in Medicine are readily employed by the government, the same cannot be said of the other two. Even in the case of Medicine, the fact that the graduates are readily absorbed does not warrant the conclusion that they are of high quality. In fact, the causal link between the quality of graduates and the rate at which they are being absorbed in gainful employment is not immediately clear. What is clear however, is that when the demand for a certain category of graduates outstrips its supply, as is the case with medicine, then issues of quality are likely to be relegated to obscurity.

Generally, with the exception of medicine, the claim that the technical graduates are being readily employed lacks merit. While this may have been true several years ago, times have since changed and it is not uncommon to find technical graduates staying for as long as three years before getting their first employment. Indeed, from our computations for the period taken by the 36 graduates interviewed before getting their first employment, we obtained a mean of 1.75 years, which by any standards is not a short time. Thus, while some technical graduates such as the medics take a relatively shorter period, there are others who take relatively longer periods before getting their first employment. In any case, while the lecturers insisted that their graduates are being readily absorbed, with the exception of the medical lecturer, the rest did not seem to know where their graduates are employed, further casting doubts on the genuinity of their claims.

A third group comprising twenty per cent of the lecturers who evaluated the quality of the graduates to be high, or 10% of the total number of lecturers interviewed, used thoroughness of the training offered by their departments as a criterion for determining the quality of their graduates. Their central argument is that the quality of their graduates is high because they have been thoroughly trained. We take thorough training to imply that the graduates have been adequately fed with relevant knowledge and skills which make them competent to undertake

suitable tasks corresponding to their training. While we have no objection to their criterion, we give them a benefit of doubt as to whether their departments do actually provide thorough training given the constraints bedeviling technical training in public universities which have been detailed in our next chapter.

Positive feedback from the employers was the fourth criteria used, though by only one lecturer, to gauge the quality of graduates. The lecturer who also doubles up as a departmental head noted that his department usually make enquiries from the employers about the suitability and performance of their graduates on the job. He was enthusiastic that the response so far has been very positive. The only difficulty he observed is that some graduates are unwilling to let the department know where they are employed, fearing that such information may be used by the Higher Education Loans Board to press upon their employers to deduct government loans which financed their university education. Again, we find no fault with an evaluation of the quality of graduates based on the feedback from the employers.

The last of the ten lecturers, who affirmed that their graduates are of high quality, did not give any specific reason in support of his position. We find his response baseless and treat it as an attempt to defend graduates produced by the department without any proper justification.

Of the nine lecturers who indicated that the quality of their graduates is low, eight or 88.9% used the nature of training provided as the criterion for judgement. It will be recalled that we had already endorsed thoroughness of training as a basis for graduate quality assessment. In so doing, we operated on the premise that the more thorough the training, the higher the quality of the graduates, and conversely, the less thorough the training, the lower the quality. The lecturers observed that the curriculum prescribes the inputs which the students should acquire

through training, noting that if these inputs are properly disseminated and well internalised, then the resultant graduates should be regarded as high quality. However, being participants in the process of input dissemination, the lecturers expressed the fear that the process of input dissemination has not been properly done.

Their argument is that the quality of graduates produced by their departments has been grossly undermined by inadequate training occasioned by several factors. First, it was observed that a number of variables including the shortening of academic semesters and the slow settlement by students at the start of a semester sometimes intervene to limit the actual time available for the lecturers to cover the syllabus. This leaves the lecturers with two hard options: either to teach efficiently and face the risk of not completing the syllabus, or hurriedly complete the syllabus and face the risk of not achieving the objectives of the course taught.

Of the 20 lecturers interviewed, 80% stated that they complete the syllabus regularly, 15% indicated that they rarely complete the syllabus, while 5% admitted that they have never completed the syllabus. When we interpret this response against the background of the on-going discussion, we can conclude that the majority (80%) of the lecturers interviewed prefer quantitative syllabus coverage while only a small proportion (20%) seem to care about qualitative coverage. This finding therefore reinforces the argument that "whenever centrally prescribed contents of a training course are incompatible with allotted time of training, the question which turns out to be most important to the trainers is how and when to finish the prescribed content before examination time, not how to treat each content. Subsequently, training goes on at a rush, dominated by lecture, dictation and passing on of factual information as fast as possible just to finish on time, in which case the trainees are left with very little or no opportunity to master the

necessary knowledge and skills that they are expected to gain” (**Kenya Journal of Education 1996,10**).

Second, lack of adequate equipment and the obsolescence of the existing ones was identified as a major obstacle standing on the path of the lecturers in their bid to transmit practical skills, thereby lending credence to the frequent attacks on technical graduates as being too theoretical. In fact, the problem of equipment has been revisited and highlighted by the 1997 – 2001 development plan which has noted that “ ... the majority of training institutions have not kept pace with changing technologies and lack proper and up to date equipment”(**Government of Kenya 1997,141**).

The only other lecturer who had granted the quality of graduates to be low did not present any reason in support of his position. Like a critique without a suggestion, we regard his position as baseless. However, there was one lecturer who indicated that he does not know whether or not his department has succeeded in producing high quality graduates. For him, the quality of the graduates can only be assessed on the basis of the feedback received from the employers regarding the efficiency and performance of the employed graduates. However, he noted that from the limited interaction currently obtaining between the public universities and the employing institutions, it is not possible to make an accurate assessment of the quality of graduates. We find this to be a plausible argument based on the criteria of responses from the employers which we had already given a clean bill of health.

From our discussion so far, we have established that out of ten lecturers who gave an affirmative response, 30% based their arguments on a tenable criteria, 60% based their judgement on faulty criteria, while 10% provided a baseless response. In essence therefore, only three

lecturers or 15% of the total number of lecturers interviewed, correctly assessed the quality of their graduates to be high. The remaining seven or 35% were merely being defensive of the graduates produced by their departments. At the same time, out of the nine who judged the quality of the graduates to be low, eight based their judgement on a sound criteria, while one did not provide any basis of judgement. This means that only 8 or 40% of the total number of lecturers interviewed accurately evaluated the quality of their graduates to be low.

It is evident from the foregoing that the majority of the lecturers who had assessed the quality of graduates to be high did not have a sound basis for doing so and therefore seemed to have been driven by the desire to defend their graduates and hopefully protect the integrity of their departments. Given that only 15% and 40% of the total number of lecturers interviewed satisfactorily assessed the quality of their graduates to be high and low respectively, we can arrive at the conclusion that, despite the fact that a good number of lecturers were unable to make an accurate evaluation of the quality of their graduates, the majority of those who made the assessment accurately concurred that the quality of the technical graduates are generally low.

3.5.3 QUALITATIVE ASSESSMENT FROM THE OUTPUT SIDE

The study sought to establish the average period of time taken by employed graduates with no previous work experience, to be able to work efficiently without any assistance. The period of time in this case was treated as a measure of the quality of the graduates so that those graduates who took relatively shorter periods were regarded as high quality, while those who took longer periods were regarded as low quality graduates. The guiding assumption in this study was that the graduates were occupying jobs commensurate with their university training. Indeed, 72.2% of the graduates interviewed confirmed that their present jobs were very relevant, while 22.2% stated that it was slightly relevant, and a paltry 5.6% indicated that it was not relevant at

all. This shows that the majority of the graduates were actually occupying positions for which they had been trained at the university.

Against this background, both the employers and the employed graduates were targeted with questions regarding the period of time taken by the graduates to master their jobs. While the graduates were asked to estimate the period of time it had taken them to be able to perform their jobs independently, the employers were required to estimate the average period of time taken by their graduate employees to work efficiently. Their response is shown in tables 3.4. and 3.5

Table 3.4 Response by Graduate employees

TIME TAKEN TO PERFORM PRESENT JOB EFFICIENTLY			
ACTUAL TIME TAKEN	DESCRIPTIVE VALUE	FREQUENCY	PERCENTAGE
1-3 MONTHS	VERY SHORT	2	5.6%
4-6 MONTHS	SHORT	8	22.1%
7-9 MONTHS	AVERAGE	6	16.7%
10-12 MONTHS	LONG	6	16.7%
MORE THAN 12 MONTHS	VERY LONG	12	33.3%
DIFFICULT TO TELL	UNKNOWN	2	5.6%
TOTAL		36	100%

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Table 3.5 Response by employers of university graduates

AVERAGE TIME TAKEN BY TECHNICAL GRADUATES TO WORK EFFICIENTLY			
ACTUAL TIME TAKE	DESCRIPTIVE VALUE	FREQUENCY	PERCENTAGE
1-3 MONTHS	VERY SHORT	1	5.6%
4-6 MONTHS	SHORT	4	22.2%
7-9 MONTHS	AVERAGE	0	-
10-12 MONTHS	LONG	1	5.6%
MORE THAN 12 MONTHS	VERY LONG	10	55.5%
DIFFICULT TO TELL	UNKNOWN	2	11.1%
TOTAL		18	100%

A close look at the two tables reveals that the responses by the two categories of respondents do not differ significantly. Not only are they agreed that the majority of the graduates take a period which can be accurately described as “very long”, but they also agree that a significant proportion of the technical graduates take a relatively shorter time to be able to function independently as productive labour. This near similarity in response is not a work of chance but can be accounted for. The very fact that 83.3% of the employers and 88.9% of the employees interviewed were drawn from the same firms, companies and employing institutions means that the response by the majority of the graduates was already reflected in the employers’ response. The only difference is that while the graduates were particular about themselves, the employers were general about all the graduates under their employment and this may account for whatever little variation observed in the responses.

That the employers and the graduate employees were able to assess the same phenomenon from different perspectives and provide a response that does not vary significantly adds to our confidence that each of them made an accurate assessment. It should be noted that the two graduates who found it difficult to tell how long it had taken them to perform their jobs independently were fresh recruits who had been in their jobs for hardly a month and therefore did not know how much longer it would take them to master their jobs. One of the employers who could not state the average period taken by the graduate employees to work on their own argued that the actual period of time taken was a function of the nature of the job and the employees previous working experience and hence it was difficult to arrive at a generalised evaluation. She observed that some graduates who have had previous working experience are never willing to disclose it to the new employers and are therefore likely to bank on such experience to take a relatively shorter time than their fresh counterparts.

The study also attempted to establish whether technical graduates from some professions generally take shorter time than others. For this purpose, the response by the graduates was redistributed in terms of the degree obtained and tabulated as follows: -

Table 3.6 Response by graduate employees

TIME TAKEN TO WORK EFFICIENTLY		DEGREE OBTAINED					
ACTUAL TIME TAKEN	DESCRIPTIVE VALUE	B.Sc. METEOROLOGY	B.Sc. MECH. ENG.	B.Sc. FOOD SCIENCE	B.Sc. MEDICINE	TOTAL	%
1-3 MONTHS	VERY SHORT	1	1	-	-	2	5.6%
4-6 MONTHS	SHORT	2	1	2	3	8	22.1%
7-9 MONTHS	AVERAGE	1	1	1	3	6	16.7%
10-12 MONTHS	LONG	1	2	1	2	6	16.7%
MORE THAN 12 MONTHS	VERY LONG	3	4	4	1	12	33.3%
DIFFICULT TO TELL	UNKNOWN	-	1	-	1	2	5.6%
TOTAL		8	10	8	10	36	100

From table 3.6 it is clear that 60% of the medical doctors, 50% of the meteorologists, 37.5% of the Food technologists, and 30% of the Mechanical engineers interviewed had taken less than ten months to be competent in their jobs. Since more than ten months has been described as “a long period”, we can argue that graduates in Medicine and Meteorology tend to take a relatively shorter time compared to Food science and mechanical engineering graduates who tend to take a longer time to settle down on their jobs. However, on the whole, medical doctors seem to take the shortest time, while Mechanical Engineers take the longest time.

The relatively short time taken by the majority of graduates in medicine can be attributed to the nature of their training. The study noted that the training of medical doctors is unique in at least four significant ways. First, it is one of the longest training programs at the university, lasting for a total of six years at the undergraduate level. Second, it is probably the only training programme at the university which is undertaken within the anticipated work environment of the

trainee (hospitals). The immediate advantage of this is that it makes working a continuation of the learning process and ensures that the skills acquired by the students are relevant to the needs of their work stations. This particular feature of medical training has solicited the argument that "engineering institutions should have consulting agencies to serve the institutions in the same way as teaching hospitals serve medical schools" (Mc Nown 1970, 125).

Third, upon successful completion of their six-year training, graduates in medicine have to undergo a compulsory one-year internship in a busy government medical institution, preferably a national or a provincial hospital. Finally, unlike most of their colleagues, medical graduates are guaranteed employment upon graduation, with the government being their automatic first employer. These factors greatly enhance the efficiency of fresh medical graduates so that when they are formally employed after the internship, they take a shorter time to master their profession.

The contributory factors to the relatively longer period taken by mechanical engineers and food technologists in particular, and technical graduates in general, have been detailed in our next chapter. However, it should be noted at this point that a section of employers were particularly critical of engineers, with one employer observing that "if you employed an engineer who has never worked anywhere, you can be sure he will not be able to perform the job in the first 18 months of employment. That is why we insist on experience ...". While this remark appears harsh, it supports an earlier observation made to the effect that "a common complaint from employers of graduate engineers is that they are not capable of performing as engineers on the job for several years after graduation" (Mc Nown 1970, 78).

From our discussion so far, two related observations can be made. First, the majority of the technical graduates tend to take long before they can be relied on as independent productive labour. Second, certain categories of technical graduates tend to take a relatively shorter period

than others to achieve the same feat. When these two observations are applied to our guiding principle that the longer the duration taken to master the job, the lower the quality of the graduate, we arrive at the conclusion that, while the quality of graduates tend to vary from one technical profession to the other, the majority of technical graduates are generally of low quality.

Besides the length of time taken by the graduates to perform their jobs competently, the employers were also asked to assess the overall performance of the freshly recruited graduates on the job. Performance in this case was taken as a measure of graduate quality such that the better the performance of a freshly recruited graduate on the job, the higher his quality. The employer's response is shown in table 3.7 below:-

Table 3.7 Response by employers of university graduates.

PERFORMANCE OF FRESHLY RECRUITED GRADUATE EMPLOYEES ON THE JOB		
RESPONSE	FREQUENCY	PERCENTAGE
GOOD	3	16.7%
AVERAGE	13	72.2%
POOR	2	11.1%
TOTAL	18	100%

While only 27.8% of the employers interviewed outrightly assessed the performance of their freshly recruited graduates to be either good or poor, 72.2% noted that it was average. If performance is taken as the display of one's knowledge, skills and attitudes in the actual work environment, then an average performer differs from a poor performer in that at least he has some vital knowledge, skills and attitudes which the latter lacks. However, he differs from a good performer in that he lacks some vital knowledge, skills and attitudes which the latter has. From

this distinction it can be seen that an average performer has certain vital knowledge, skills and attitudes but lacks others which are equally vital.

The employers are therefore agreed that the majority of the fresh technical graduates, while possessing some useful knowledge, skills and attitudes required in the work environment, are found lacking in others. If we invoke our guiding principle that the better the performance of the graduates, the higher their quality, then we can see that the graduates are not of high quality since their performance is not good, but average. In any case, the very fact that they are lacking certain vital skills requisite for effective performance of their jobs, confirm that their quality is not high, if we take a high quality graduate to be one possessing and able to display the necessary skills, knowledge and attitude in the work environment.

That technical training in Kenya has failed to produce quality technical personnel is further reflected in the emerging trend among the entrepreneurs to retrain technical graduates before engaging them, with others opting to provide on-the-job training to recruits with no formal technical education. In an article, Attachment Vital for graduates, Kariuki Wangai notes that "recruiting companies have at times been forced to organise on the job training before the graduates could be productively engaged. Even those from professional faculties like engineering have had to go through long periods of orientation, sometimes under less-educated technicians. This has led some employers to put a strong case against engaging university graduates. Many, especially in the manufacturing sector, are opting for school leavers and training them on-the-job for much lower wages" (**Daily Nation, July 12, 1997,17**).

The danger with this trend is that on-the-job training hinders labour mobility and flexibility since it is job-specific. Furthermore, the rejection of technical graduates could be a major disincentive to those wishing to pursue careers in the technical professions and may

therefore have a negative impact on enrolment in technical subjects, and in the technical institutions.

3.6 CONCLUSION

The seriousness and determination of the Kenya government to produce quality manpower through technical training cannot be doubted. Indeed, the need to produce a class of technical manpower with the skills and technical know-how commensurate with the needs of the economy is one of the stated objectives of technical training in Kenya. In order to realise this objective, several measures have been taken by the government, including physical expansion of the technical training facilities, harmonisation and rationalisation of the curriculum offered and certificates awarded, and the creation of linkages in the training programmes offered at the various levels of technical training.

These efforts coalesced to form the current elaborate network of technical training. With its emphasis on practical aspects of training, industrial attachment and continuous assessment of the trainee's progress, it was hoped that technical training would produce quality manpower at all levels of training. The university, being the highest institution offering technical training, was particularly expected to manufacture high calibre graduates in the technical professions such as Medicine, Agriculture, Engineering, Food Technology, Meteorology, Geology, Survey, Architecture and Veterinary science.

However, despite all the efforts made and the resultant fairly elaborate technical training system in Kenya, the development of quality technical personnel is a goal which remains far from being achieved. Although a number of the lecturers interviewed appeared defensive of the quality of graduates produced by their departments, the study adduced sufficient evidence to show that the quality of technical graduates has remained generally low. To this end, one cannot

help reaching the conclusion that, “in one of the most important indicators of development – education – it would appear that Kenya has made a lot of progress. However, we appear to have concentrated on quantitative rather than qualitative achievement” (**School Digest 1997,10**).

Given the current status of technical manpower in Kenya, the way forward would be to identify the obstacles to effective development of credible technical manpower and to suggest remedial measures which will accelerate the manufacture and supply of technically qualified personnel. This is essentially the crux of our discussion in the next chapter.

CHAPTER FOUR

CONSTRAINTS TO EFFECTIVE DEVELOPMENT OF THE HIGHER CADRE TECHNICAL MANPOWER IN KENYA

4.1 INTRODUCTION

Although Kenya boasts one of the most elaborate systems of technical training in the developing world, the quality of her technical graduates has remained consistently low over the years. The purpose of this chapter therefore, is to identify the factors which have persistently undermined the efforts to produce high calibre technical graduates.

The chapter is divided into five major parts, each highlighting a specific obstacle to the development of high quality technical graduates. The first section examines the inefficient process of input identification and aggregation, otherwise known as curriculum development and review as a factor influencing the quality of technical graduates. The second section focus on the inapt teaching of the practical aspects of the technical courses. Section three examines the impact of the poorly co-ordinated industrial attachment for university students on the quality of the resultant graduates. The fourth section analyses the examination system with specific reference to the administration of continuous assessment tests and practical examinations as well as the effect of examination irregularities on the process of practical skill-formation. The final section addresses the inadequate interaction between the universities and the employing institutions as a factor hindering the manufacture of high calibre graduates. The chapter ends with a conclusion which recapitulates on the main findings while at the same time setting stage for the issues to be raised in the last chapter.

4.2 INEFFICIENT UNIVERSITY CURRICULUM DEVELOPMENT AND REVIEW

STRATEGY

As indicated in our previous chapter, curriculum refers to all that is planned to enable the student acquire and develop the desired knowledge, skills and attitudes. Curriculum development is therefore taken as the process of planning or designing an appropriate package of knowledge, skills and attitudes to be disseminated to the students within a learning environment. This package however, needs to be adopted to changing circumstances so that the content of the curriculum is not rendered obsolete by the ever-changing graduate demand patterns. The process of adopting the curriculum to the changes in the relevant sectors of the wider society is what we have referred to as curriculum review.

This study was guided by the hypothesis that the more efficient the process of curriculum development and review, the higher the quality of the resultant graduates. An efficient strategy in this case was regarded as one which is not only flexible enough to accommodate changes in the relevant sectors of the wider society through frequent reviews, but is also inclusive in the sense that it involves all the major stake-holders in the human resource development process, especially the employers.

Two indicators of efficiency emerging from the foregoing are the frequency and the inclusiveness of the curriculum development and review process. With respect to frequency, the lecturers were asked how often the curriculum offered in their respective departments are reviewed and responded as shown in Table 4.1: -

Table 4.1 Lecturers' Response

Faculty/Department	Frequency of curriculum Review				Total
	Very Regularly	Regularly	Rarely	Don't Know	
Mech. Engineering	-	-	4	1	5
Food Science	-	-	5	-	5
Meteorology	-	3	2	-	5
Medicine	1	1	3	-	5
TOTAL	1	4	14	1	20
PERCENTAGE	5%	20%	70%	5%	100%

It can be seen from the table that the majority of the lecturers feel that the university technical curriculum is rarely reviewed. However, while this is a very general observation, it is also noticeable that although the lecturers from the departments of Mechanical Engineering and Food Science are particularly unanimous on the fact that the curriculum is rarely reviewed, their colleagues from the department of meteorology and the faculty of medicine exhibited a slight divergence in opinion. With respect to meteorology, it is instructive to note that the departmental head, while observing that the reviews have been done regularly, noted that the last one was actually undertaken in early 1998. In the case of medicine, the divergence in views could be accounted for by the fact that it is an expansive faculty with over twenty teaching departments, some of which offer pre-clinical while others offer clinical courses. Since the lectures were drawn from different departments it is possible that some departments within the faculty of medicine have had their curriculum reviewed more often than others. With very few exceptions therefore, the various technical curricula offered in public universities are rarely reviewed.

The argument that the reviews are rarely undertaken is further reinforced by the observation made to the effect that the curriculum offered in most of the departments were last

reviewed in response to the changes in the education system which ushered in the 8-4-4 system of education fourteen years ago. Indeed, out of the 14 lecturers who noted that the curriculum is rarely reviewed, 13 indicated that the last review was prompted by change in the education system, while one saw it as a routine up-dating of the curriculum. At the same time, all the five lecturers who stated that the curriculum is regularly reviewed also noted that the reviews are usually motivated by the changes in job-market.

It would therefore appear that those departments whose curriculum has been reviewed more frequently are those motivated by the changes in the job-market. Given the dynamic nature of the job-market, the only way to keep pace with innovations and technological advances is to have them reflected in the curriculum as soon as they occur. This ensures that the resultant graduates at any given time possess knowledge, skills and attitudes commensurate with those required by the employing institutions. This makes graduates from such departments to be relatively good performers on the job.

It will be recalled that in our previous chapter we established that the graduates in medicine and meteorology tend to take a relatively shorter time to settle down on their jobs compared to mechanical engineers and food technologists. We then concluded that although the quality of technical graduates are generally low, in strictly comparative terms, graduates in medicine and meteorology tend to be of slightly higher quality than their mechanical engineering and food science counterparts. It is not accidental therefore, that in our present discussion, we have established again that the departments of Mechanical Engineering and Food Science whose graduates tended to be of much lower quality, rarely undertake curriculum reviews. It is equally not a work of chance that the departments of Meteorology and Medicine which appeared to be producing slightly high calibre graduates undertake comparatively regular reviews. The emerging pattern therefore is one in which those departments which tend to undertake frequent

curriculum reviews produce relatively high calibre graduates while those which rarely review their curriculum tend to produce relatively low quality graduates. These findings confirm our assumption that the frequency of curriculum review is related to the quality of the graduates so that the more frequently the curriculum is reviewed, the higher the quality of the resultant graduates.

The study also identified the extent of inclusivity of the curriculum review process as another indicator of the efficiency of the review strategy so that the more inclusive the review process is, the more efficient the strategy is regarded to be. We have had occasions to mention in our previous chapters that the university curriculum development process is a preserve of the university senate. We also observed that the senates of the various public universities do not accommodate the representatives of industry in the process of curriculum development. However, there is need to add at this point that the various degree awarding departments and faculties may, with the approval of the senate, undertake their curriculum reviews, in which case the decision to solicit the views of the employers is solely at their discretion.

Against this background, the lecturers were asked to state whether the potential employers of their graduates are ever consulted when reviewing the curriculum. Their response is shown in table 4 .2.

Table 4.2 Whether Employers are consulted in Curriculum Development

RESPONSE	FREQUENCY	PERCENTAGE
YES	5	25%
NO	14	70%
DON'T KNOW	1	5%
TOTAL	20	100%

At the same time, a corroborative question was directed to the employers regarding how often they have been consulted by the educationists about the suitability of the courses included in their curricula. Their response is depicted in table 4.3.

Table 4.3 The Frequency of consultation with the trainers

RESPONSE	FREQUENCY	PERCENTAGE
REGULARLY	1	5.6%
RARELY	2	11.1%
NEVER	15	83.3%
TOTAL	18	100%

Table 4.2 and 4.3 reveal a strong agreement between the lecturers and the employers that the level of participation of the latter in the process of curriculum review is generally very low. What then, is the effect of this low level of participation on the quality of the resultant graduates? Out of the 15 employers who observed that they have never been consulted, 12 graded the performance of their freshly recruited graduates to be average, 2 noted that they are poor, while one observed that they are good. At the same time, all the two employers who had been rarely

consulted assessed the graduate employees to be good performers. Meanwhile, the only employer who noted that he had been consulted regularly evaluated the performance of the employed graduates to be average.

From these findings, one can notice a trend in which the majority of those who had never been consulted tend to assess their graduates to be average performers, while the majority of those who had been consulted, whether regularly or rarely, tend to grade their graduate employees to be good performers. This shows therefore that there is some correlation between the level of participation of the employers in the process of curriculum review, and the performance of the resultant graduates on the job. Since performance is a measure of the quality of the graduates and the level of consultation (or participation) an indication of the inclusivity of the review process, it becomes evident that the more inclusive the process of curriculum development and review, the higher the quality of the resultant graduates.

The causal link between the extent of inclusivity of the curriculum review process and the quality of the resultant graduates can be further explained by taking recourse to the goals of technical training. It is now clear that one of the principal objectives of technical training in Kenya is to match the products of the training institutions with the needs of the economy. Indeed, "a developing nation like ours cannot afford education for education's sake ... what is imparted in schools and colleges should be harmonised with industrial needs" (**Daily Nation, July 12, 1997, 17**).

In this regard, the curriculum must be geared towards training manpower for the economy. However, "in order to train for the economy, there is need to strike a balance between economic needs and academic skills" (**UNESCO 1996,157**). This makes the employers important resource persons in the process of curriculum development and review as they hold vital information regarding the most current and urgent needs of the economy. Their

incorporation in the process of curriculum development and review ensure that the curriculum reflects the true aspirations and the most current needs of the employing institutions. It is little wonder therefore, that those few employers whose views have been accommodated through the review indicated that the quality of the graduates is high. Neither is it surprising that the generally low level of participation of the employers in the process of curriculum review has found a concomitant in the low quality of graduates.

From our discussion so far, we can conclude that the curriculum development and review strategy adopted by public universities is inefficient since it neither encourages frequent reviews, nor does it incorporate the employers who are the major stake-holders in the output side of the human resource development equation. Since the reviews are undertaken infrequently, and principally as an input side affair, the curriculum content has in most cases trailed technological advances; a development which has made technical graduates to be average or poor performers on the job, rather than the good or excellent performers they are expected to be.

4.3 INAPT TEACHING OF TECHNICAL COURSES IN PUBLIC UNIVERSITIES

In the preparation of technical graduates, theory and practice richly blend each other in the process of practical skill formation. Theory provides the background knowledge which the students, and later graduates, fall on when confronted with a problem of practical nature. Practical lessons and demonstrations on the other hand are vital as testing grounds for the practicability of the theories and principles learnt in class. An appropriate balance must therefore be struck and maintained between theory and practicals if the resultant graduates are to be good practical problem solvers which they are expected to be.

This study was pegged on the hypothesis that the greater the emphasis on practical skills, the higher the quality of the resultant graduates. Two interrelated questions were adopted to guide the discussion in this section. First, does the curriculum lay sufficient emphasis on practical skills? Second, are there adequate facilities for practical lessons?

The response by the lecturers to the first question is shown in table 4.4

Table 4.4 Lecturers' Response

Department/Faculty	Whether the balance between theory and practice is adequate			
	YES	NO	DON'T KNOW	TOTAL
Meteorology	-	5	-	5
Mech. Engineering	1	3	1	5
Food Science	4	1	-	5
Medicine	3	2	-	5
TOTAL	8	11	1	20
PERCENTAGE	40%	55%	5%	100%

From the table, the feeling of the majority of the lecturers is that the balance between theoretical knowledge and practical skills emphasised by the technical departments is not adequate as it is tilted in favour of the former. Consequently, all the eleven lecturers who assessed the balance to be inadequate recommended in a rare unison that there is need to design more practical oriented programs since the current one is a bit too theoretical. At the same time, six out of the eight lecturers who had indicated that the balance is adequate observed that the implementation of the practical aspects of the curriculum has been hampered by a number of problems, particularly inadequate equipment whose discussion follows shortly. In essence

therefore, they too admitted that in actual practice, the theoretical aspect of technical training has not been properly done.

The foregoing points to the fact that the current balance between theoretical knowledge and practical skills is not appropriate, and hence does not adequately prepare the students for their future roles in the society as technologists. As a result of the inadequate emphasis on practical skills, the graduates produced tend to be too theoretical and hence unable to solve the many practical problems in the world of work. This could explain why the majority of technical graduates tend to take long before mastering their jobs.

As regards the second question, the study proceeded from the premise that even where an adequate balance seems to have been struck between theoretical knowledge and practical skills as is the case in food science for example, the actual teaching of the university technical courses is also a function of the availability, status and adequacy of the equipment for practical demonstrations. In other words, the teaching of technical courses can only be effective, and therefore produce desired results, if adequate, modern and upto-date equipment are readily available when required. Since the desired results in this case is taken to be high quality graduates, it follows logically that the availability and adequacy of modern equipment influences the quality of the graduates so that the more readily available, adequate and up-to-date the equipment are, the higher the quality of the resultant graduates.

On the basis of these preliminary observations, the students and lectures were asked to state how often lack of equipment render scheduled practical lessons not to take off completely. Their response is presented in tables 4.5 and 4.6 respectively.

Table 4.5 Response by students

Degree Programme	Frequency of failed practicals due to lack of equipment			
	Regularly	Rarely	Never	Total
B.Sc. Meteorology	2	10	4	16
B.Sc. Mech. Engineering	4	15	1	20
B.Sc. Food Science	2	12	2	16
B.Sc. Medicine	3	16	5	24
TOTAL	11	53	12	76
PERCENTAGE	14.5%	69.7%	15.8%	100%

Table 4.6 response by lecturers

Department/Faculty	Frequency of failed practicals due to lack of equipment			
	Regularly	Rarely	Never	Total
Meteorology	1	4	0	5
Mech. Engineering	4	1	0	5
Food Science	1	4	0	5
Medicine	2	3	0	5
TOTAL	8	12	0	20
PERCENTAGE	40%	60%	0%	100%

Two observations can be made from tables 4.5 and 4.6. First, the majority of the students and lecturers interviewed are in agreement that they rarely fail to hold practical lessons completely due to lack of equipment. Second, the two categories of respondents also seem to be in agreement that the problem of non-availability of equipment tend to be slightly more acute in mechanical engineering and medicine than in meteorology and Food Science.

The foregoing reveals that in most technical departments lack of equipment inhibit scheduled practical lessons on rare occasions. By and large therefore, probably with the exception of mechanical engineering, the equipment are normally available when required. This finding disconfirmed our assumption that the unavailability of the equipment for practical demonstrations was largely responsible for the low quality of the technical graduates. However, although the equipment are normally available, there was a strong feeling among both the students and the lecturers that most of the equipment used for practicals have virtually outlived their usefulness. In the case of food science for example, one lecturer observed that “until very recently the equipment have been available and in good condition, but due to lack of finance for repairs and maintenance, some equipment are now unoperational”. The study also noted numerous cases of old apparatus failing to yield required results. Under the circumstances, public universities find themselves embroiled in a paradoxical situation in which they seek to develop modern technologists using old and in some cases obsolete equipment and technology. The logical fruition of this is the production of technical graduates who are decades behind the present industrial and economic needs.

The question which arises from the foregoing is whether the available equipment are always enough for all students. The response to this question by the lecturers and the students is shown in tables. 4.7 and 4.8 respectively.

Table 4.7 Lecturers' Response

Department/Faculty	Whether the Equipment are always Sufficient		
	Yes	No	Total
Meteorology	-	5	5
Mech. Engineering	-	5	5
Food Science	-	5	5
Medicine	3	2	5
TOTAL	3	17	20
PERCENTAGE	15%	85%	100%

Table 4.8 Students' Response

Degree Programme	Whether the Equipment are always sufficient		
	Yes	No	Total
B.Sc. Meteorology	4	12	16
B.Sc.Mech. Engineering	-	20	20
B.Sc.Food Science	1	15	16
B.Sc.Medicine	2	22	24
TOTAL	7	69	76
PERCENTAGE	9.2%	90.8%	100%

Once again, the lecturers and the students concur that the equipment are not always enough for all students. Furthermore, out of the 36 graduates, 29 or 80.6% supported this sentiment noting that the situation was the same when they were students at the university. This shows that lack of adequate equipment has been a definitive characteristic of the university technical departments and faculties for ages. If anything, the problem has further been exacerbated by the increase in student population in the recent past, even in the hither to uncrowded technical fields.

The inadequacy of the available equipment compels us to seek to establish how the practical lesson hour is normally spent. The majority of the students (85.5%) and lecturers (85%) interviewed observed that whenever the equipment for carrying out a given practical are not adequate, students share the existing ones. In fact, in most technical departments, students are usually divided into working groups for the purposes of undertaking practicals.

As attractive as it might look, sharing has its demerits. First, it encourages jockeying as the lazy students capitalise on the efforts of their more enterprising colleagues. Second, a number of students voiced their concern that at times “know-all students” dominate every aspect of the practicals and hardly allow their colleagues in the same group to have a feel of the proceedings during the practicals, thereby rendering them to be mere spectators. Third, where the various groups go for practicals at different times, some students never turn up, only to copy the findings of their colleagues later. Fourth, sharing limits the number of practicals which can be done in a given semester or academic year as it takes longer to complete one practical, especially where students work in shifts. Finally, where students work in shifts, there is a danger of making practicals appear as an extra-curriculum activity since students do it at their own free time, in more or less the same way they would do games and sports.

To this end, some general comment will suffice. Although in most cases the equipment for practicals are never completely lacking, the teaching of technical courses in public universities has been greatly impaired by the inadequacy and obsolescence of most equipment. It is inconceivable for example, that the old fashioned equipment found in most university workshops and laboratories can be used to demonstrate modern techniques.

Before deriving the conclusions for this section, it is important to note that a part from lack of adequate equipment and its attending problems, the study also identified several other factors which inhibit practical lessons. First, some laboratory technicians were accused of failing

to release schedules for laboratory practicals in time and in some cases failing to prepare the necessary apparatus in advance. Second, practical lessons also fail when the theory providing background knowledge necessary for the practical in question has not been taught. In such cases, the lecturers usually convert the practical lesson hour for normal lecturers. Third, the lecturers were also accused of occasionally failing to honour the scheduled practical or to give guidance on the same. Fourth, lack of material component of practical such as reagents in the case of medicine and food science was also identified as a very common problem occasioning postponement or general avoidance of certain practicals. Finally, there are also unavoidable circumstances such as power failure, lack of water, public holidays and student riots which make it impossible for the practicals to go on as planned.

In conclusion, it can be noted that most university technical curricula does not lay sufficient emphasis on practical skills. Indeed, from the very beginning, the lecturers had already revealed in table 4.4 that the curricula offered in the departments of meteorology and mechanical engineering was a bit too theoretical and therefore can not produce practical – oriented graduates. While medicine and food science appeared to have a relatively well balanced curricula, the actual teaching of the practical aspects of the curriculum has been hampered by the inadequacy and obsolescence of most of the existing equipment. In short therefore, the inapt teaching of technical courses reflected in the relatively low level of practical skills emphasised has immensely contributed to the low quality of technical graduates.

4.4 POOR CO-ORDINATION OF INDUSTRIAL ATTACHMENTS FOR UNIVERSITY STUDENTS

It was observed in our previous chapter that in a state of equilibrium, the task of input dissemination is shared between the university and the industry on the basis of comparative advantage. As one scholar has pointed out, “ever since technical operations in industry became based on scientific and technological principles, it has been considered that engineers and technicians should be educated and trained partly in education institutions and partly in industry. Each partner in the process should attend to those activities for which it is best fitted” (Fishwick 1983,12).

We further noted that unlike theoretical knowledge which can best be acquired within the training institutions, practical skills can best be developed through industrial attachments which serve to integrate the theoretical knowledge learnt and practical skills acquired through university training, with the operational skills required in the field. In addition, industrial attachment orientate the students to their anticipated work environment.

The guiding hypothesis for our current study was that the more efficient the industrial attachment arrangement, the higher the quality of the graduates. An efficient industrial attachment arrangement is one which ensures that:-

- i) all students go for attachment as scheduled;
- ii) the duties assigned to the students during their attachment are relevant to their fields of study and commensurate with their level of training; and
- iii) There is adequate mechanisms for evaluating the progress of the students during their attachment.

Asked whether they have ever gone for an industrial attachment, the students responded as shown in table 4.9 below: -

Table 4.9 Whether ever attended an industrial attachment (Elective Term)

YEAR OF STUDY	DEPARTMENT									
	FOOD SCIENCE		MECH. ENGIN.		MEDICINE		TOTAL		PERCENTAGE	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
FIRST	0	4	0	4	0	4	0	12	0%	100%
SECOND	1	3	2	2	0	4	3	9	25%	75%
THIRD	1	3	2	2	0	4	3	9	25%	75%
FOURTH	3	1	2	2	1	3	6	6	50%	50%
FIFTH	-	-	3	1	3	1	6	2	75%	25%
SIXTH	-	-	-	-	4	0	4	0	100%	0%
TOTAL	5	11	9	11	8	16	22	38	36.7%	63.3%
%	31.3%	68.7%	45%	55%	33.3%	66.7%	36.7%	63.3%	-	-

The following information should serve as a prelude to interpreting table 4.9. First, the table deliberately excludes meteorology students since industrial attachment is not part of their training. Second, mechanical engineering and food science students undergo their formal industrial attachment at the end of their fourth and third year respectively. Third, medical students from the University of Nairobi are usually attached to Kenyatta National Hospital for their clinical courses after completing the two-year pre-clinical medicine courses at the Chiromo Campus. In addition, they are required to undertake an elective term which is an equivalent of industrial attachment during their fifth year.

Given this background information, it was expected that all fourth year food science, fifth year mechanical engineering and sixth year medicine students had at least gone for an attachment

or elective term as the case may be. However, from the table it can be seen that whereas all the four sixth year medicine students interviewed had gone for an elective term, at least one fourth year food science and one fifth year mechanical engineering students had never gone for industrial attachment. This means that while the majority of students seem to be attending their attachment when due, there are a few students who do not attend the attachment as scheduled. Indeed, the table reveals several instances where some students have not gone for attachment while their classmates claim to have gone. In essence therefore, the students seem to be going for the attachments in a rather haphazard manner. It is noteworthy for example, that while some few second year food science and mechanical engineering students claim to have gone for their industrial attachment, some of their colleagues in the fourth and fifth years respectively were yet to go for the attachment.

As a cross-check to the students' response, the lecturers were asked whether they are aware of instances when some students fail to attend industrial attachment when they should. Out of the 15 lecturers whose departments have provisions for industrial attachment, 7 or 46.7% noted that students always go for attachment when they should, 5 or 33.3% observed that they are aware of occasions when some students do not go for attachment when due, while 3 or 20% stated that they are not aware whether some students fail to go for the attachments. Of particular importance to note from these findings is the fact that at least some lecturers are aware that not all students go for attachment as scheduled.

Apart from student indisposition which besides being unavoidable, is a rare occurrence, lack of attachment places and finances for students upkeep during the attachment were identified as the major reasons barring some students from attending attachment sessions. Lack of attachment places can best be understood within the context of institutional attitudes towards industrial training.

From a research carried out in several African universities in the 1970s, Dr. Chukwujekwu identified two types of institutional attitudes towards industrial training. The first one places the responsibility of students' placement for industrial attachment on the university authorities. Under this arrangement, successful industrial training is a prerequisite for the award of a degree. This ensures that all students go for attachment and remain traceable throughout the period. The second institutional attitude places no responsibility on the university authorities to find industrial training opportunities for the students. However, the students are usually assisted whenever possible to obtain attachment places. The industrial training in this case does not account towards the degree award. Dr. Chukwujekwu notes that under this second institutional attitude, it is rare for all students to obtain attachment places, adding that in most cases at least 15 – 20% of the students fail to secure attachment places.

Dr. Chukwujekwu and his colleagues categorised the University of Nairobi as having the second institutional attitude. Twenty years since this study was carried out, this attitude does not seem to have changed in any significant way. To-date, most students in the technical departments of the University of Nairobi shoulder the heavy responsibility of seeking attachment places on their own, in which case the possibility of some students failing to secure attachment places is not very remote. In fact, of the 24 interviewed students who had gone for attachment, 18 or 75% secured attachment places on their own, and only 6 or 25% were assisted by the university to get attachment places. Perhaps the only visible change is that some university technical departments have now pegged degree awards to successful completion of industrial training. The study observed for example that in the Department of Food Technology and Nutrition, students have to go for industrial attachment "even if it means going after completing the studies". Failure to attend industrial attachment means that the students have not fulfilled the degree requirements and hence cannot graduate.

On the issue of finance, most technical departments either do not give allowance to students for their upkeep during the attachment or give too little to sustain the students during the period. As a result, the students largely rely on the good will of the industry for their upkeep allowances during the attachment period. However, the reliance on industry to pay allowances has both advantages and disadvantages. Precisely, “one of the major advantages is that industry feels more committed to the programme since they are spending money on it and could ensure it succeeds. Their control on the students is also strict. One of the disadvantages is that there is a wide variation in allowances payable and sometimes this, more than the quality of training, controls students options for places of training” (**Journal of Engineering Education and Research 1978,17**).

The difficulties observed notwithstanding, it can be argued that the majority of the students do attend industrial attachment when due. The immediate question which arises however, is the relevance of the duties assigned to the students during the attachment. Out of the 24 students who had attended attachment, 8 or 33.3% evaluated the duties assigned to them during the attachment to be very relevant, 4 or 16.7% noted that they are relevant, while 12 or 50% stated that they were slightly relevant. Although no student was assigned a job which is not relevant at all, it is noteworthy that the majority of the students felt that the duties assigned to them were only slightly relevant.

As regards the third indicator of an efficient industrial attachment arrangements, the lecturers were asked whether they make any follow-ups on the progress of the students during industrial attachment. Table 4.11 represents the views of those lecturers whose departments have provisions for attachment.

Table 4.11 Lecturers' Response

DEPARTMENT /FACULTY	WHETHER STUDENTS ARE FOLLOWED-UP DURING ATTACHMENTS			
	Yes	No	Don't Know	Total
Mech. Eng.	-	3	2	5
Food Science	4	1	-	5
Medicine	2	1	2	5
Total	6	5	4	15
PERCENTAGE	40%	33.3%	26.7%	100%

Table 4.11 reveals that student follow-ups vary from one department to the other. While the Department of Food Science and some departments within the Faculty of Medicine seem to be keen on the students' progress during attachments, the same cannot be said of Mechanical Engineering. However, while the majority of the lecturers interviewed (40%) confirmed that their departments usually undertake follow-ups for the students, it is telling enough that another significant proportion of the lecturers (33.3%) indicated that such follow-ups are never done. The whole issue becomes even more intricate when one considers the fact that a sizeable number of the lecturers (26.7%) stated that they do not know whether their departments make follow-ups or not.

Since the follow-ups are supposed to be done by the lecturers, and given that 18 out of 20 or 90% of the lecturers interviewed were either departmental heads, professors or senior lecturers, it is difficult to imagine that a department can undertake follow-ups without the knowledge of such senior members of staff. In fact, it is more likely that the lecturers who stated that they did not know whether there are follow-ups were simply prevaricating on the fact that their departments do not make follow-ups. Implicit in this argument is the fact that the correct

response for those who indicated that they do not know, should have been that the follow-ups are never done, in which case all mechanical engineering lecturers and the majority of their colleagues from the Faculty of Medicine refute the claim that there are follow-ups. If this line of argument is pursued further then it can be seen that contrary to the picture presented in table 4.11, the truth is that the majority of the lecturers (53.3%) feel that students are never followed-up during their attachment.

From our discussion so far, it becomes clear that the industrial attachment arrangements for university students, while varying from one department to the other, are generally far from being efficient. Not only does it fail to ensure that all students attend the attachment when due, but perhaps more important, it also fails to monitor the progress of the students during attachment thereby occasioning instances where students are not assigned duties relevant to their profession or commensurate with their level of training. As a result, students do not get sufficient operational skills and adequate industrial exposure. It is not surprising therefore, that graduates from the departments such as mechanical engineering which appear to be lacking in all the three elements of an efficient industrial attachment arrangement, take too long to master their jobs. This is probably because they take the first few months of their employment to master the operational skills which they would have acquired under a properly managed industrial attachment scheme. In short therefore, the inefficient industrial attachment arrangements for university students is a major contributory factor to the low quality of the technical graduates.

4.5 MALADMINISTRATION OF UNIVERSITY EXAMINATIONS

Besides the common place knowledge that examinations test levels of competence, they also assist greatly in the process of skill-formation. As already noted, since the immediate preoccupation of most students is how to pass the examinations, their perception of what is likely to constitute the examination package will determine what skills they lay emphasis on. Consequently, where the examinations emphasize practical skills and problem solving ability, the students will put equally more effort on the same. Similarly, the more frequently the students' progress is evaluated, the more they will be compelled to read as they prepare for each of the continuous evaluation tests. However, no matter how often the students are assessed and what kind of skills are emphasised, examination can only serve effectively as an instrument for influencing skill-formation if it is free of all forms of irregularities.

This study was therefore premised on the hypothesis that the more efficient an examination system is, the higher the quality of the resultant graduates. An efficient examination system in this case was taken to be one which ensures that: -

- (i) the progress of the students is regularly evaluated through properly managed continuous assessment tests;
- (ii) the level of practical skill-formation achieved by the students is periodically assessed through practical examinations; and
- (iii) At the end of a training session, whether a semester or an academic year, the overall gains made in terms of knowledge, skills and attitudes acquired by the students is subjected to a thorough examination devoid of any traces of irregularities.

As regards the first mark of an efficient examination system, the study noted that the examination system adopted by public universities lay sufficient emphasis on continuous assessment of students. The principal objective of continuous assessment in this case is “to provide the students with maximum opportunities to learn and demonstrate from time to time the knowledge, the skills and the attitudes that they have acquired during the teaching – learning process” (Ogunniyi 1984, 113).

The continuous assessment tests administered in most technical departments account for up to 30% of the total end of the year grades. The remaining 70% are usually obtained from the end of semester or year examinations. However, for some courses such as Engineering drawing offered in the department of mechanical engineering, part of the 70% marks is derived from practical assignments given and assessed in the course of the year. For other courses like Engineering design and computer programming offered in the same department, the students are assessed solely by coursework and continuous assessment tests.

Although the emphasis on continuous assessment seems to be adequate, the administration of these continuous assessment tests is still wanting in most cases. There is a lot of laxity in supervision leaving ample room for cheating as students walk into the assessment venues with lecture notes. In some cases the tests are not as continuous as the name suggests. There are cases for example where only one test is done throughout the semester instead of the stipulated three or four, thereby watering down the element of continuity of the tests. Generally, the way the tests are administered in most cases render them unable to achieve their objectives.

Concerning practical examinations, the study noted that some technical departments do not administer practical examinations in the sense that students enter the laboratory to perform a given experiment under examination conditions. In most of those departments students normally present reports on the practicals done during the semester or year, on the basis of which they are

graded. It emerged from the study that some of the students do not attend the practicals, but duplicate reports written by their colleagues or by previous students. Since those who duplicate previous reports normally select the best of the previous reports, it is difficult to refute the claim by some students that their dishonest colleagues usually obtain higher scores than those who have actually performed the lab work in question. Under the circumstances, it is equally difficult to resist the conclusion that “if there were to be a practical examination, the students would be more serious with each of the experiments they perform in the laboratory. The examination could be a “viva voice” type in which a student is asked to describe one of the experiments he had done during the year” (Mc Nown 1970,103).

With respect to the last indicator of an efficient examination system, the students and the lecturers were asked to state whether they have experienced any form of examination irregularities in their departments. Their response is shown in tables 4.12 and 4.13 respectively.

Table 4.12 Students’ Response

DEGREE PROGRAMME	WHETHER WITNESSED ANY EXAM IRREGULARITY IN YOUR DPT			
	YES	NO	TOTAL	YES%
Bsc. Meteorology	11	5	16	68.8%
Bsc. Mech. Eng.	15	5	20	75%
Bsc. Food Science	8	8	16	50%
Bsc. Medicine	14	10	24	58.3%
TOTAL	48	28	76	63.2%
PERCENTAGE	63.2%	36.8%	100%	-

Table 4.13 Lecturers' Response

DEPARTMENT/ FACULTY	WHETHER WITNESSED ANY EXAM IRREGULARITY IN YOUR DPT			
	YES	NO	TOTAL	% OF YES
Meteorology	2	3	5	40%
Mech. Eng.	5	0	5	100%
Food Science	3	2	5	60%
Medicine	1	4	5	20%
TOTAL	11	9	20	55%
PERCENTAGE	55%	45%	100%	-

Two issues become apparent from the tables. First, the majority of the students and the lecturers interviewed concur that they have witnessed examination irregularities in their respective departments. Second, their opinion also converge on the fact that the irregularities tend to vary from one department to the other, with Mechanical Engineering appearing to be most affected. However, regarding the least affected departments, the lecturers and students seem to display some slight difference in opinion, with the former indicating that it is Medicine and Meteorology while the latter feel that it is medicine and Food Science. Nonetheless, it is instructive to note that the two categories of respondents seem to be in agreement that Mechanical Engineering whose graduates were found to be taking too long to master their jobs experience more noticeable irregularities, whereas medicine whose graduates tend to take relatively shorter time experience less noticeable anomalies.

The above discussion points to the fact that the more a department is prone to examination irregularities, the higher the chances that its graduates will take longer to master their jobs. This is because students in such departments tend to be much more preoccupied with devising strategies of passing examinations than mastering the necessary skills. In the study,

students gave fascinating accounts of how examination irregularities are intelligently executed using special codes and communication techniques. The most common form of examination irregularity however appears to be the use of “pambana” and “Mwakenya” (small papers containing summarised or coded lecture notes on topics anticipated in the examinations, which are usually smuggled by students into the examination venues for the purposes of aiding them in examinations). The danger with this trend is that if a student is sure that “pambana” and “mwakenya” will serve him well in the examinations, reading will not be of any use to him. In short, examination irregularities promote what Angela Little has referred to as “paper qualification syndrome” – the feeling that one is qualified for a given job by virtue of the certificates and grades obtained and yet he does not have the skills matching the job. Such a person inevitably has to be a poor performer on the job.

Despite the use of “pambana” and “mwakenya” and other forms of examination irregularities, the students and their lecturers noted that the frequency of the examination irregularities is generally low and the magnitude small. Nonetheless, given the importance attached to university examinations, it is not permissible that even a single instance of irregularity should ever occur. It appears that the root cause of the irregularities lie in the misplaced emphasis on examination and certification at the expense of the knowledge, skills and attitudes that need to be acquired by the students. Indeed, “it is widely believed that the education system, rather than preparing learners for openings in the economy, has concentrated far too much on certification through curricula that are too academic and theoretical” (**Educafrica 1987, 51**).

From our discussion so far, it can be seen that the university examination system is not very efficient. While it puts adequate emphasis on continuous assessment, poor administration and inadequate supervision of the continuous assessment tests has rendered them unable to achieve their intended objectives. Relatedly, very few technical departments seem to be

administering practical examinations in which students perform a repeat of one of the experiments they had done, but within limited time and under strict supervision. Most departments are contented with grading mere reports on practicals which, as we have noted, may be copied from colleagues or from previous reports. Since practical examinations is the best way to test practical skills, it can be argued that in such departments, practical skill-formation is not adequately evaluated. That the examination system is not very efficient is further reflected in the fact that it is not tightly sealed from irregularities. In this regard, the possibility of some “chaff passing out as wheat” is not far fetched.

It can therefore be argued that the inefficiency of the examination system has contributed to the manufacturing of low calibre technical graduates. However, it need to be emphasised that the effect of the poorly administered university examinations on the quality of the graduates is only modest. This is exemplified by the fact that Food Science whose graduates were found to be of relatively low quality compared to medicine and Meteorology was evaluated by the students to be least affected by the irregularities. In any case, the quality of the graduates are generally low despite the fact that the frequency of the irregularities is low and the magnitude small. We can therefore arrive at the conclusion that, while there seems to be more stronger forces shaping the quality of technical graduates, the inefficient examination system has also contributed, albeit modestly, to the low quality of the technical graduates.

4.6 INADEQUATE UNIVERSITY – INDUSTRY CO-OPERATION

Apart from the deficiencies inherent in the input side of the human resource development equation which have preoccupied us so far, the study also noted some defect in the feedback loop from the employers to the trainers. Ideally, the role of this feedback loop is two fold. First, it should relay information from the employers to the trainers regarding the performance and suitability of the trained manpower in relation to industrial and commercial needs. Second, it should convey financial and material support to the training institutions to assist them in their endeavour to develop the right kind of manpower relevant to the most current and urgent needs of the employing institutions. Indeed, in a properly developed university – industry co-operation, “industrial representatives should be involved in policy decisions and industry’s manpower requirements should determine how many and what kinds of technicians (and technologists) are trained” (Mc Nown 1970, 22).

Against this background, our present study was grounded on the hypothesis that the stronger the link between the training institutions and the employing institutions, the higher the quality of the graduates. The strength of the link between the two sets of institutions was assessed in terms of the twin roles of the feedback loop. In other words, a strong link was taken to be one where: -

- (i) there are regular consultations between the employers and the trainers regarding the performance and suitability of the graduates in relation to the most pressing industrial and commercial needs; and
- (ii) the employers provide support, both material and financial, to the trainers to aid them in their endeavour to produce high quality manpower.

When the lectures were asked how often their departments consult the employers on the suitability and performance of their graduates on the job, their response was as shown in table 4.14 below: -

Table 4.14 Lecturers' Response

DEPARTMENT/ FACULTY	FREQUENCY OF CONSULTING EMPLOYERS ON GRADUATES' SUITABILITY				
	Regularly	Rarely	Never	Don't Know	Total
Mech. Eng.	0	3	1	1	5
Food Science	0	5	0	0	5
Meteorology	2	0	0	3	5
Medicine	2	1	2	0	5
TOTAL	4	9	3	4	20
PERCENTAGE	20%	45%	15%	20%	100%

Two important observations can be made from the table. First, the majority of the lecturers are of the view that their departments rarely consult the employers about the performance and suitability of their graduates. Second, the frequency of consultation vary from one department to the other, with Medicine and Meteorology appearing to have slightly more frequent consultations than Mechanical Engineering and Food Science. This pattern of pairing up coincides with an earlier one regarding the relative quality of the graduates produced by each of the departments. What emerges therefore is a situation whereby the more frequently a department holds consultations with the employers, the higher the quality of its graduates.

It is evident therefore, that the infrequent consultation between the employers and the trainers has greatly contributed to the relatively low quality graduates. Due to lack of feedback from the employers to the trainers, the latter continue producing graduates whose relevance have since diminished owing to the ever-changing needs of the employing institutions. Studies

undertaken by the Directorate of Industrial Training in 1995 for example, have revealed that “there are skill shortages in textiles, building and construction and food processing while there are surplus graduates in other sectors; this is due to lack of a system of feedback from users to training institutions leading to a supply and demand mismatch” (Government of Kenya 1997, 140).

As regards financial and material support from the employers to the trainers, very few firms seem to have come in aid of the training institutions, particularly public universities. Out of the 18 employers interviewed for example, only 3 or 16.7% had given either financial support or equipment and teaching aid or annual awards to best students. Evidently therefore, a strong relationship between these two sets of institutions will ensure partnership in the development of human resources in which case, the employers will assist the trainers overcome such difficulties as lack of equipment and inadequate teaching material by either supplying the same or providing financial means to purchase them.

Even as we make this observation, it is not lost to us that the employers do contribute to the industrial training level fund which was set up way back in 1971 for the purchase and maintenance of equipment in the technical institutions and faculties. However, as already mentioned, the fund has not been properly used for the purpose for which it was set up. The result is lack of adequate modern and up to-date equipment whose effect on the overall goal of human resource development has already been discussed.

Our findings so far indicate that the link between the training and the employing institutions is generally weak. The feed back loop neither relays the required information regarding the nature of adjustment that need to be made on the graduates-to-be to make them fit on their jobs well, nor does it carry sufficient support, both financial and material, to enable the training institutions develop quality graduates. This weak link has greatly affected the quality of

technical graduates since their training has not been tailored to correspond to the needs of the economy.

4.7 CONCLUSION

This chapter has established that over the years, a number of factors have continuously undermined the development of quality technical manpower through public universities. First, the inefficient curriculum development and review strategy characterised by infrequent reviews and an exclusive review process has left the taught courses trailing behind industrial and technological advances in the world of work. Consequently, there is a mismatch between the graduates produced by the public universities and those required by the employing institutions. In essence therefore, “how our progress in education is related to the rest of the development process is still doubtful. This is demonstrated by the lack of harmony between the economy or industry for which we are educating our children and the education content itself” (**The school Digest 1997, 10**).

Second, the low level of practical skill emphasised by public universities has occasioned the production of technical graduates without adequate practical skills. This low level of practical skills is a result of the imbalance between theoretical knowledge and practical skills which is skewed towards the former. Furthermore, practical demonstration of the theories and principles learnt in class has been hampered by the inadequacy and poor status of technical equipment.

Third, the inefficient industrial attachment arrangements for university students has led to the passing out of technical graduates without adequate industrial exposure and therefore lacking hands-on experience, operational skills and the necessary work attitude. Consequently, technical

graduates take too long learning on the job before they can function independently as productive labour.

Fourth, poor organisation and administration of university examinations, particularly inadequate evaluation of practical skill-formation, and the relatively infrequent examination irregularities has promoted the production of “paper graduates” – graduates with higher paper qualifications but without the necessary skills which possession of their papers (certificates) imply. Obviously, such graduates cannot be good performers on the job.

Finally, it has been observed that the weak link between public universities and the employers has denied the former vital information on the basis of which adjustments can be made on the graduates-to-be to enable them fit on their jobs. At the same time, lack of proper co-operation between the two sides of the human resource development equation has made it difficult for the employers to assist the trainers since they do not know their needs. In essence therefore, this weak link has contributed greatly to the low quality of technical graduates.

Given these findings, and guided by the philosophy that anything without a solution is not a problem, the study attempts in the last chapter to suggest remedial measures to the problems identified.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 SUMMARY

Although formal education in Kenya was pioneered by the missionaries, it did not take long before the colonial government got involved in African education, initially by providing money grants to the mission schools, and later by setting up Government African schools. However, the missionaries and the colonial government only provided the kind of education which was politically, economically and socio-culturally rewarding to them. Throughout the colonial period, the education system was racially stratified with a separate syllabus for the Europeans, Asians and Africans. Indeed, while the former two were accorded academic type of education, the Africans were condemned to technical education, ostensibly because they have inferior mental faculties incapable of grasping academic subjects. This racist attitude ignited protests from the Africans who began to view colonial education as a racist tool designed principally to portray the Africans as mentally inferior people. The Africans responded promptly to this "cultural insult" by setting up their own schools, first through the independent schools movements, and later through the local Native councils.

At independence, Kenya, like other new nations emerging from the relics of colonialism, urgently needed a formula to improve her generally underdeveloped status. Consequently, the education system was unified in January 1967, and the goal of education shifted from serving the parochial interests of a small segment of the larger society (the missionaries, the colonialists and the settlers) to that of nation-building. In other words, education henceforth aimed at training manpower for the economy. This shift in goal was necessitated by the fact that "in the post-

independence era, it was widely anticipated that the development of human resources, more than any other single factor, would be the panacea of development” (Mikkelsen 1978,30).

Ironically, one aspect of formal education which was given the pride of place in the post independent Kenya was technical education which had been greatly resented by the Africans during the hey days of colonialism. This renewed interest in technical training was catalyzed by the realization that it held the key to Kenya’s immediate and long-term manpower needs. Acting on this precept, the post-independence leaders began by developing and expanding the technical institutions and structures left by the retreating colonialists. However, since the colonialists had only concentrated in the production of artisans and craftsmen, efforts were also made to develop the middle level training institutions in order to meet the rapidly increasing demand for the middle level technical personnel.

The development of the higher levels of education was relatively slow both before and after independence. In fact, it was not until 1961 that the Royal Technical College became a University college attached to the University of London. Two years later, it became a constituent college of the newly created University of East Africa. With the dissolution of the University of East Africa, and the birth of the University of Nairobi as an autonomous institution in 1970, a new era dawned on technical training as additional technical faculties and departments were set up and the old ones expanded. Throughout the Kenyatta era, the guiding policy for university education was to expand training facilities within a single institution – the University of Nairobi.

The Moi era however, witnessed a more ambitious expansion of training opportunities through the creation of additional public universities. This expansion was conceived and executed within the context of promoting higher technical education. In this regard, a second university with a definite bias on technology and related sciences was set up in Eldoret in 1984 and named Moi University. In addition, two former technical institutions – Egerton and Jomo

Kenyatta – were elevated into public universities in 1987 and 1994 respectively, with the expectation that they would maintain their technical orientation even after acquiring university status. Thus, apart from Kenyatta University which began as a colonial military base, the other four public universities have had long association with technical training.

With the expansion of technical training facilities upto university level, the development of technical training reached its logical conclusion. The resultant elaborate network of training institutions stretching from the youth polytechnics through the technical training institutes and the National Polytechnics, to the public universities is a living testimony of the government's efforts over the years to promote technical training. Furthermore, through a series of policy pronouncements including the official government policy on the 8-4-4 system of education published in 1984 and the sessional paper No.6 of 1988 on "Education and Manpower Training for the Next Decade and Beyond", the government reiterated that the goal of technical training at all levels is to produce skilled manpower relevant to the needs of the economy. To facilitate the attainment of this goal, the government undertook several measures including the harmonization and rationalisation of the curriculum offered and certificates awarded, the creation of linkages in the training programmes offered at the various levels of technical training, the emphasis on practical skills including mandatory industrial attachment for the trainees, and the provisions for continuous monitoring and evaluation of the students' learning progress both within the learning institutions and during attachments.

Given all that the government has done over the years to promote technical training, the expectation was that technical institutions, particularly public universities, being the manufacturers of the cream of the various shades of technical expertise, would produce thoroughly trained and competent technical graduates possessing nothing short of the needs of the economy. Contrary to this expectation, evidence adduced by this study indicates that the

quality of the technical graduates from local public universities are generally low. Their main undoing is lack of adequate practical skills and hands-on experience, poor work attitude and general inflexibility.

5.2 CONCLUSION

The study has sufficiently illustrated that, while the quality of the graduates vary from one technical profession to the other, the majority of the technical graduates are generally of low quality. Most of the lecturers interviewed appeared defensive of the quality of their graduates. This was probably born out of the desire to protect the integrity of their departments. Nonetheless, a careful analysis of the data provided by those who made accurate assessment confirmed that the quality of the technical graduates still remain below the expected standard.

The employers and the employed technical graduates however, minced no words in confirming that the public universities have not succeeded in producing high quality graduates. The two respondent categories concur that fresh technical graduates tend to take long before they can be relied on as independent productive labour. This is because they leave the university before acquiring some vital knowledge, skills and attitudes necessary for the performance of their professional duties.

The study also identified a number of factors which, individually and collectively, account for the ineptitude of the technical graduates. First, the curriculum development and review strategy adopted by public universities was found to be inefficient. Not only is the curriculum reviewed infrequently but the review process also does not incorporate the employers despite the fact that they hold valuable information regarding the most current needs of the economy. The result is the continued production of graduates with little relevance to the needs of their professions.

Second, the teaching of the practical aspects of technical courses was found to be inadequate. This is because the balance between theoretical knowledge and practical skills emphasized is tilted in favour of the former. The problem has been further compounded by lack of adequate, modern and upto-date equipment for practical demonstration of the theories and principles learnt in class. This low level of practical skills has led to the production of theory-oriented graduates incapable of solving the myriad practical problems confronting them in their work place.

Third, industrial attachment for university students has not been properly coordinated, leading to a situation where some students fail to go for attachments when due. Furthermore, lack of proper mechanisms for evaluating the progress of the students during attachments has made some students to undertake irrelevant assignments during their attachments. The inefficient industrial attachment arrangements for university students has led to the production of graduates without adequate industrial exposure and hence lacking hands-on experience.

Fourth, the weak link between the public universities and the employers has made it difficult for the universities to adjust their graduates to the needs of the employing institutions, while at the same time rendering the employers unable to assist the universities since they too have not kept abreast of the needs of the trainers. In essence therefore, lack of dialogue between the two sides of the human resource development equation has greatly exacerbated the current graduate demand-supply mismatch.

Finally, the university examination system was found to be inefficient since it does not adequately assess levels of practical skill-formation, besides not being watertight enough to preclude irregularities. This inefficient examination system has heightened “paper qualification syndrome” – the feeling of qualification for a given job by virtue of holding certificates showing that one has passed some examinations, while in essence lacking the corresponding skills. Paper

graduates obviously cannot be good performers on the job. While the first four factors seems to have a much greater influence on the quality of technical graduates, the effect of the poorly administered university examinations on the quality of the graduates is only modest. This is demonstrated by the fact that the quality of the graduates are considerably low even though the frequency of the examination irregularities are low and their magnitude is small.

In a nutshell therefore, the study confirmed our hypothesis that the nature of training provided by the Kenyan public universities does not adequately prepare the higher cadre technical manpower for their roles in the society as technologists.

5.3 RECOMMENDATION

This study has demonstrated that effective development of the higher cadre technical manpower in Kenya has been constrained by a number of factors. On the strength of the findings of the study therefore, we make the following recommendations: -

- (i) **Public universities should adopt a more efficient curriculum development and review strategy.** There is need to create a joint university curriculum development and review board for all public universities, to harmonize the curricula offered in the various universities and to ensure that such curricula conform to acceptable standards. At the same time, the board would ensure that the curriculum review process is inclusive of all the major stake-holders, and is flexible enough to accommodate innovations and technological advances in industry and economy. The board should be composed of, but not necessarily limited to, educationists, employers and government officials and should functionally operate through small course (subject) panels comprising of the senior

lecturers and reknown academicians in a given field, as well as employers of the graduates from that particular field.

- (ii) **Public universities should lay sufficient emphasis on practical skills.** For this to happen, there is need to strike and maintain proper balance between theoretical knowledge and practical skills so as to produce well balanced graduates. Since the current training programmes were found to be a bit too theoretical, the need to design practical-oriented technical courses is more urgent now than ever before. Lack of adequate and upto-date equipment was identified as a major bottleneck in the teaching of the practical aspects of the technical courses. This problem can be addressed through efficient management of the industrial training levy fund from which public universities and the other technical institutions can derive the financial means to purchase and maintain modern equipment.
- (iii) **Industrial attachment for university students should be properly coordinated.** The university authorities should accept the responsibility of obtaining attachment opportunities for their students to avoid situations where some students fail to secure attachment places. Similarly, the university should mobilize funds to provide adequate attachment allowances for the students' upkeep during attachment so that students can be posted to any reputable firm where they can get good industrial training, regardless of whether the firm gives them some allowances or not. This is important because a good number of firms offering commendable industrial training do not provide allowances to the students on attachment. At the same time, adequate mechanisms should be put into place to monitor the progress of the students during attachment. Apart from industrial visits, the employers should be encouraged to send sincere confidential reports to the university regarding the performance and general attitude of the students during

attachment. Lastly, but perhaps more important, industrial training should contribute towards the degree obtained by a student so that no student is allowed to graduate without satisfactorily undertaking an industrial attachment. This will ensure that all students get hands-on experience and adequate industrial exposure before leaving the university for the actual professional work.

- (iv) **University technical departments and faculties should administer practical examinations and eradicate examination irregularities.** There can be no better way of testing practical skill-formation than through practical examinations. Consequently, there should be continuous assessment of practical skill-formation through lab work exercises, and at the end of the academic year or semester, students should undertake practical examinations in the practical-oriented units. Similarly, the university examinations should be more vigilantly supervised to avoid irregularities. More severe penalties (not empty threats) should be prescribed and actually meted out to culprits to curb this ignoble practice.
- (v) **Deliberate efforts should be made to foster a stronger link between public universities and the employing institutions.** Appropriate channels of communication should be identified and regularly exploited to facilitate flow of information between the trainers and the employers. This will keep the two sides of the human resource development equation informed of the needs of each other and enable them to appreciate each other as partners in the process of human resource development. The channels of communication in this regard may include seminars, workshops, publications, questionnaires, letters and visits.
- (vi) **The education system should be overhauled.** The current four-year secondary school education does not adequately prepare students for university education. Not only is the

duration too short, but the training offered is also too general, thereby denying the students a chance to specialise in subjects related to what they would want to do at the university. There is need therefore, to re-introduce the two year advanced secondary education. In other words, the education system should be changed from 8-4-4- to 8-6-4.

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