MANAGEMENT IN THE TERTIARY EDUCATIONAL SECTOR IN KENYA

MOD 690 - A Thesis in Management and Organisational Development.

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Preface

This thesis has been written in order to fulfill the course requirement for completion of a Masters Degree in Management and Organisational Development, the United States International University - Nairobi Campus (Africa). However from commencement of my studies on this course it has been my ardent wish to carry out research and apply my 'newly acquired management skills' to some organisational problem which is not wholly academic and which will prove of practical benefit to others as well as having direct relevance to my daily work environment. As a consequence, this work seeks to analyse management and its problems with respect to the Tertiary Technical Education sector in Kenya, with a view to making suggestions for improvement and the ultimate enhancement of its performance.

The first three Sections and also Section six, of this work, are intended to provide a background to the perceived problem on an historical basis; Sections five and seven outline the findings of two pertinent reports – one Governmental and the other somewhat more academic. Section four is aimed towards providing a theoretical insight into some of the deficiencies in
tertiary technical educational management as I understand them, and thereafter provide possible directions for the improvement of same based on the application of modern management theory and practice. This naturally leads to a series of conclusions and recommendations in Section eight, with the purpose of its reorganisation into an 'objective management strategy'.

I have attempted to keep the theory and examples as simple as possible and hope that in so doing I hope that I have not detracted from the importance of their possible application to the problems outlined; also the recommendations and findings as stated in Section eight are intended only as rudimentary outlines to possible solutions and will obviously require a great deal more research and development.

My original intention was to look at the objectivity, control and measurable results of the 'technical aid programme' in Kenya, but as my investigations and research advanced it became increasingly apparent that deficiencies in control criteria where fundamental to the whole problem of management of tertiary technical education and as a result my researches became more widespread and the
nature of the thesis has as a result become more general.

It is therefore my sincere wish that the work carried out will in the future assist in providing the basis for much more detailed research and development in the fields of both tertiary educational management and also in terms of application of modern systems of monitoring and control to 'budget orientated' entities. Particularly in terms of technical education, it is my hope that the work will assist in improving the appropriateness, objectivity and ultimately the performance of the sector for the benefit of all of the individuals concerned and the Nation as a whole.
Acknowledgements

In carrying out the work which has resulted in this thesis document, I am indebted to a large number of people who have helped, assisted and reorientated my thoughts and direction throughout; space does not allow me to mention all of them individually - however I must express my particular gratitude and thanks to the following persons in particular:-

- Mr S.T. Harmon of the U.S.I.U. - Africa, for his helpful and constructive direction and his patience as my tutor throughout this work and in other studies which have assisted here-in.

- Mr W.D. Stump of the British High Commission - Nairobi; for his general assistance and helpful information as well as his valuable time.

The following people for allowing themselves to be interviewed during their valuable time and for answering my various questions.

Mr P. Oloo - Okaka; Principal of Kenya Polytechnic.
Mr Alan Jones; British Council - Nairobi.
Mr Barry Goode; Deputy Registrar - Kenya Polytechnic.


I must also express my deep appreciation to Mr George Clarke of Grabowsky & Poort - Engineering Consultants, for the use of his Apple IIe computer which proved invaluable in the editing and word processing of this text.

Last but by no means least, thanks are due to my wife Christine, for her unstinting support, understanding and assistance throughout the whole course of study and particularly for her patient reading and correcting of the text and various drafts.
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Section I

Background Introduction

The author has been concerned with Tertiary technical Education in Kenya for the last four years and was earlier (1977 to 1979) involved with the setting up of a Technical Education Centre in Salvador - Brazil; both areas of work having involved 'Aid' contributions to the Governments concerned through the British Government - Overseas Development Administration budget. Although the Brazilian project does not figure in the text of this thesis, its mention is made in view of the fact that the problems there-in encountered and the likely remedies are in my view similar to those hereafter outlined and my experience with this earlier project has greatly contributed to my analysis and findings within this current project.

In fact the Kenya and Mombasa Polytechnics have been the recipients of Aid in the form of both British supplemented staff and Capital for equipment and other resources, since Independence and the formation of the Republic of Kenya in 1963; due to changing demands on the two Institutions however, they have undergone
considerable reorientation and expansion in the twenty years following Independence.

From the late 1970's to the present date, suggestions for the introduction of two additional but similar Educational Institutions have been pursued with the result that the Jomo Kenyatta College of Agriculture and Technology was designed, built and is now in operation – having been aided to a large extent by the Japanese Government; the early 1980's have seen proposals and studies for a 'third' Polytechnic to be situated in Eldoret with a view to serving Western Kenya – the studies, final report and contemporarily, designs for the first three buildings of the proposed campus have been funded by the European Development Fund of the European Communities.

It is not my intention in this thesis to question directly the relevance of expansion of the higher technical education sector, albeit my research and experience tends suggest that there is likely to prove an overcapacity in certain technical areas unless blatant duplicity of courses is not checked – this is especially so when considering the effects of the stagnating economy which is currently being encountered in Kenya. Moreover on this same theme,
the most serious problem occurring in Tertiary Technical Education is that of acute shortage of suitably trained, qualified and experienced teaching staff - a problem which is likely to be exacerbated if the economy shows a marked upswing, due to the economic demands of Industry and the constraints of the Education Ministry.

1. **Government Policy**

My attempt is rather to analyse the criteria on which the development of tertiary technical education has been based and thereafter suggest possible areas for improvement, with a view to ensuring that the scarce economic and personnel resources are 'finely tuned' and directed towards realistic needs, and that meaningful control criteria are also established in order to ensure more effective management within the sector, in accordance with the Industrial Training Act.

2. There should be consultation with Industry when courses are being planned, with regard to the industry to be concerned.

3. There should be periodic review of courses and curricula within the institutions in their places.

4. There should be an emphasis on relevance where relevant industries are concerned.
Section II

An outline of the Government and Institutional Policies with respect to Tertiary Technical Education

A. Government Policy

In order to systematically address the (possible) roots of the areas of difficulty, it is first pertinent to outline Government Policy on such Tertiary or Higher Education in respect of Technical, Commercial and Business orientated Education and it is as follows:

1. There should be close liaison with Employers in accordance with the Industrial Training Act.

2. There should be consultation, when courses are being planned, with the Ministries likely to be concerned.

3. There should be a move to drop lower level courses and develop higher level courses in their places.

4. There should be no duplication of courses where this would prove uneconomic.
5. Although there will be an overall ceiling on enrolments, the Polytechnics will continue to be flexible regarding individual courses in response to the requirements of Employers.

B. The existing (Kenya and Mombasa) Polytechnics

Hereafter I shall outline the stated purposes of the two Institutions, which are essentially the same, and due to the fact that only details for the Kenya Polytechnic were in the main available I have deemed statements to be equally applicable to both. Furthermore, as changes have occurred and the purposes have likewise mirrored these alterations I have included these for the sake of giving a clearer picture of the developments.

1962 - The main functions of the Polytechnics are:

a) To provide instruction in the theory of a variety of subjects on a part-time basis by which the workers in Industry and Commerce may round off the practical work of their daily lives with more useful and self
sufficient skills.

b) To prepare students of all races-entering without full matriculation, either by full or part-time study in single or grouped subjects - up to near degree level standard.

1967 - The Polytechnic collaborates with Commerce and Industry in the training of technicians and sub-professional grades. The training of artisans and craftsmen will in future be dealt with in the Secondary Trade schools, which the Ministry of Education has planned to replace the Technical and Trade schools, with on-training provided in the Ministry of Labour Training Centres. The Polytechnic maintains a constant liaison with all training institutions. The functions of the Polytechnics are thus three-fold:-

a) To provide courses to enable students to qualify for University entrance and Higher Education eg. Advanced level courses.

b) To provide pre-employment courses whereby students attain a degree of competency enabling them to become usefully
employed and capable of on-going training eg. the full time commercial and secretarial courses.

c) To provide courses of instruction for apprentices and learners in commerce and in Industry which when linked to their practical 'in-service' training, produce skilled technicians.

Early 1970's to Present - At the time of major expansion of both Polytechnics, a 1974-78 Development Plan was drawn up and there is no clear statement of any Aims or Objectives there-in recorded; however a general outline is summarised for the benefit of the development of this text:-

General Policy

''''''In view of its scarce resources and the need to spread the benefits of education as widely as possible, the Government intends to control enrolments carefully at the tertiary level in accordance with the needs of the economy. The recipients of education at the tertiary level stand to gain much more personally,
from their education, than those who have received primary or secondary education only. Therefore it is the Governments policy that these recipients will in future pay a greater proportion of the direct costs of their education......."

Thereafter is stated the Government policy statement in respect of Higher Education as laid down on page 4, followed by the statements:-

**Industrial Training Act**

"The Industrial Training Act of 1971 now taking effect will have important consequences for the Kenya and Mombasa Polytechnics since it establishes a new pattern of apprenticeships. Technician apprentices will be distinguished from craft apprentices, but will share one year of craft skill training prior to technician training programmes and attendance at the Polytechnic. That in itself is likely to generate a different role for workshop facilities in the Polytechnics' Engineering courses, as well as the possibility of some
reorganisation and re-equipment.

The National Commission on Educational Objectives

"This commission will be established during the 1974-'78 period and will evaluate the present system of education as a whole, define a new set of goals and a new programme of action .........
The Commissions review may have far reaching effects on educational policy and upon the role and rationale of the Polytechnics."

Phase out of lower level courses

"........ The phase out of lower level courses denies opportunities for entry into the Polytechnics to students with less than a good form 4 certificate (GCE 'O' level or its equivalent). It could result in the door being closed to the majority of Kenya school leavers. An alternative entry requirement could be the level of employment reached eg. courses for successful workers in mid-career such as chargehands, foremen and line managers. ........"
Course Planning and Manpower requirements in respect of Technician education.

"A critical implementation problem is concerned with the identification of a range of courses which will be available for the training of middle and higher level manpower. Criteria for deciding between alternatives lie in manpower planning, statistics, training opportunities in other institutions and the demand for training, which produces direct outside pressure upon the institution. A blending of all three has resulted in the range of courses offered and proposed which have been set out in departmental statements (1) below .......".‡

However, it should be pointed out herein that although reference is made to statistics apparently indicating a need for continuation of many of the existing, as well as implementation of some new courses, salient comments have been

1. For samples of the manpower statistics referred to see appendix A
made regarding the validity and conclusivity of such figures.

As an example, a reliable source (1) concerned with British Aid projects gave information regarding the proposals for additional funding to the Kenya Polytechnic which indicated that the general Economic Justification of the proposed aid package in line with the 1974-1978 Development Plan "was based upon the very general precept that it would help to meet the Manpower needs of Kenya" - adding that it was extremely difficult to use detailed figures to back-up this justification because:

a) The Polytechnic is partially concerned with the up-grading of skills of people already in employment.

b) The macro-economic manpower projections for Kenya have been shown to have given such large margins of error that current manpower projections of requirements are not given too much credence.

c) An internal paper produced by the

1. Source and author are bound by the contingencies of the 'Official Secrets Act' - text not quoted verbatim
Ministry of Labour in August 1974 reviewing demand and supply projections for skilled manpower specifically warned against inflated expectations in estimating and forecasting demand, recommending and favouring the operation of a system of continuous review of resources based upon an incoming 'flow of data'.

C. The Jomo Kenyatta College of Agriculture and Technology.

Plans were initiated in 1979 between the Governments of Kenya and Japan for the joint design, construction and operation (for a limited period) of this tertiary educational establishment — including the sponsorship and training of 'key' administrative and teaching personnel in Japan. Construction work commenced in 1979 and the facilities were handed over to the (then) Ministry of Higher Education on 30th April 1981.

Objectives

"Jomo Kenyatta C.A.T. is a newly established institution of higher learning, offering a practical curriculum in advanced science and
technology. The Government of Kenya recognises the crucial importance of science and technology for National Development. Hence the training programmes at the J.K.C.A.T. place a heavy emphasis on practical skills which are badly needed by the farming and industrial sectors of the economy. The objectives can be summarised thus:

1. To provide young Kenyans with the technical skills necessary in making them useful citizens.
2. To prepare young Kenyans for productive employment or self employment, especially in the rural areas.
3. To train young Kenyans to fill the manpower gaps in both public and private sectors and thereby to ensure, rapid development of the National economy.
4. To orientate the attitude of youth in Kenya towards productive activities.

It is hoped that as the college develops more staff and facilities, it will undertake advanced research and demonstrations in aspects of science and technology, within the capabilities of its faculty ......... for the
college to have excellent practical teachers and researchers, a long term plan for staff development is necessary ........... Since staff development is necessary and essential for the achievements of the college objectives, internal programmes will be developed for 'on-the-job' training of the faculty" (1)

"The objectives of the establishment of this college are for the purposes of establishing practical and theoretical education for Kenyans who will be contributing to the economic and special development of the Republic of Kenya ........... Whist the Government recognises the right of every child to a basic education, it will adopt measures to ensure that access to the higher and more specialised levels is directly related to the Nation's economic needs. Moreover the recipients of the benefits of this education will be required to shoulder a greater part of its costs". (2) - This document also emphasises the need, expressed by the Government, to control the secondary and tertiary educational sectors.

1. Taken from the first college prospectus
2. 2nd draft proposal - 1975
D. The proposed 'Third Polytechnic' at Eldoret.

No clear objectives have been stated in respect of this proposed institution, however in the 'Eldoret Polytechnic - Final Report' some interesting statements are made with regard to understanding the management difficulties and likely problem areas and they are outlined here for further reference later.

"In between the big commissions of enquiry (2) the main preoccupation in Kenya's education and related Ministries seems, understandably to have been with budgetary, rather than strategic planning issues. The 1979 - '83 Development Plan in an effort to remedy this situation, recommended that a division be created within the Ministry for economic Planning with "principal responsibility for the coordination of training activities at a national level. Working through the forward budget and annual appropriations process, the division will be responsible for recommendations on appropriate levels of training allocations between Ministries. To carry out this responsibility, the division will go far beyond financial

2. Ominde in 1965 & Gachati in 1976
allocation, monitoring and control of all programmes in training and education, basing its assessment on national development goals, including manpower requirements and policies that will emerge from the forthcoming manpower survey.

It should be noted at this stage that the division mentioned now exists 'on paper' but the desired coordination is still far from having been achieved. An example stated in the report is that of the transformation of secondary technical schools into technical institutes, the incorporation of the 'Harambee' institutes into the National Industrial training scheme and the establishment of a textile training institute, a third Polytechnic and a second University - are all decisions which impinge upon each other but which are currently being taken and considered in mutual isolation.

Meanwhile at least seven agencies operating independently, collect in an uncoordinated way, information on manpower. This is in addition to the Directorate of Industrial training, Ministries of Labour, (the then) Higher Education, Economic Planning, Directorate of Personnel Management, the
Central Bureau of Statistics and the Immigration Department. The information collected is in most cases collected merely 'for the record' rather than for action and is not made use of generally in planning.

**Manpower Requirements Surveys**

No full scale manpower survey has been carried out in Kenya since 1972. (1) This therefore makes the task of quantifying and projecting the demand for qualified manpower very difficult.

The question of the relevance of this point has been brought to the attention of the present authors. The subject of the following section however received

The result is that the present authors have been brought to the attention of the present authors. The subject of the following section however received

1. In practice the 1972 survey was carried out but never published.
Section III

An analysis of the Policies - Ramifications and Implications.

Educational Policies and Objectives.

In considering the facts outlined in Section II it must be stated that the deficiencies which are thus apparent have not been wholly ignored nor remained without consideration by the Government and the various Ministries concerned; indeed these deficiencies were obvious and clearly in evidence during the late 1960's and early 1970's and resulted in the formation of a special committee of enquiry which resulted in 'The report of the National Committee on Educational Objectives and Policies'.

The results of this enquiry are of great relevance to this thesis, so much so that they are the subject of the following section; however attention has been brought to this at the present juncture in order to point out that the analysis that follows and which is my own 'reading' of the situation has doubtless traversed many paths covered previously by the afore-mentioned committee.
Analysis of the facts outlined in Section II.

1. Government Policy

As a series of guidelines, very little justifiable criticism of the stated policy can be made, except perhaps to say that the overriding 'thread' of the policy appears to focus on budgetary considerations rather than practical academic guidelines for the targets being aimed for from 'a National goals' point of view.

Moreover the policy as stated lacks some essential framework and details as will be outlined and discussed in detail in Section IV.

2. Institutional Policies

Kenya and Mombasa Polytechnics and J.K.C.A.T.

Notwithstanding statements to the contrary contained in the various documents from which the information in Section II has been extracted, it is first pertinent to highlight the fact that all of the statements quoted (pages 5 to 12) are quite clearly ones of very general policy; indeed in some of these the statements encroach upon philosophical rather than
directional and educationally orientated aims.

As a result it is apparent that to a large extent the existing Higher Technical Educational establishments are working in separate vacuums and as such there is clear evidence to support the contention that there is:-

1. A tendency towards a great deal of duplication of courses.

2. An element of competitiveness between the institutions in respect of student intakes, which is not in the interests of the Nation generally nor the Educational sector in particular - this will obviously tend to 'waste' already scarce resources and is likely in the final analysis to lead to a lowering of Educational standards; (NB Once approval of a course has been given and the course implemented, departments are loathe to abandon them and often if course competition is high, entry standards are lowered as a result of departmental acceptance of 'bare minimum qualifications').

3. A 'tug of war' situation in respect of staff allocation and posting; this situation during the last two or three years has proven to
be a serious setback to development in some departments of the Kenya Polytechnic, for example, many experienced and therefore key teaching and ancillary personnel have been transferred and/or promoted to the J.K.C.A.T., thereby causing underestabilishment. (1)

4. Lack of flexibility regarding employers needs, eg. Short courses and continuing education.

Whilst course standards are subject to somewhat rigourous external control through the Kenya National Examinations Council and the Kenya Institute of Education, course intake especially at the much longer established Kenya Polytechnic, is left largely to the discretion of the individual Heads of Departments, as is the analysis and justification for initiation and termination of new and existing courses respectively. In theory there is a standard system of reporting from Heads of Departments to the Principal in order to supply the latter with the necessary facts and figures to justify such actions - in practice however, to quote the Principal of the Kenya Polytechnic, "the system is neither as well defined nor as frequently
utilised as it should be in an ideal situation".

It is easy to understand the 'feeling' that more technical institutions of higher level are requisite throughout the Republic of Kenya - for example, if one considers the current position at the Kenya Polytechnic where the fruits of the 1974-1978 Development Plan 'Capital Aid' are already fully utilised - to the extent that the facilities are now almost 'bursting at the seams' in terms of spatial requirements, and also the very limited possibilities for further expansion on the present campus - then it is easy to understand the concern with more such institutions.

However in the light of the downturn in the Kenyan economy clearly in evidence in the last three years or so, student intake particularly on the higher level courses is on the decline in some areas and as an indication of this the placement of Ministry of Education sponsored students for the 'industrial attachment - work experience' part of their course is becoming very difficult. Furthermore all too frequent examples of higher level course graduates being made redundant soon after graduation are in evidence. (To what extent this is due to employers 'sponsoring'
students as a result of encouragement and financial incentives offered by the contingencies of the Industrial Training Act and its implementation, is not considered in any detail herein, but it does reinforce the need for more careful monitoring and effective management of the sector. This evidence does nonetheless tend to suggest that the market for some higher level technicians may be becoming saturated, or at the very least that demand is slowing down.

The purpose of highlighting such realities is to indicate that one of the major policy statements of Government, namely to have higher educational establishments which are capable of a high degree of flexibility and thereby to remain responsive to the requirements of employers by being able to adjust to demands and thus meeting the needs of the Industrial, Commercial and Ministerial sectors of the economy, is not being adequately fulfilled - indeed it cannot be so, due to the deficiencies in the planning, monitoring and control procedures.
Section IV

Correlation of the problems outlined with relevant management theories and principles.

It is my contention that the problems outlined thus far should be considered from a business management stance with the various institutions concerned being thought of as divisions or departments, or where appropriate, separate sections within the divisions or departments - all with complementary aims and objectives rather than separate and therefore largely uncoordinated ones. Whilst clearly not wholly altruistic, this sort of approach I believe will assist in ameliorating many of the areas of doubt and conflict which are to me quite apparent.

To quote Drucker in his book "Management: Tasks, Responsibilities, Practices":

"There are three popular reasons for the common failure of service institutions to perform:

- their managers are not businesslike;"
### National Priorities

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<thead>
<tr>
<th>COST</th>
<th>MEDIUM</th>
<th>LOW</th>
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<tbody>
<tr>
<td>HIGH</td>
<td>Technical Teacher Training</td>
<td>General Secretarial</td>
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<td></td>
<td>Medical Secretaries</td>
<td>Social Sciences</td>
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<td></td>
<td>Agricultural Production</td>
<td>General Building &amp; Construction</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>Construction - Maintenance</td>
<td>Statistical Analysis</td>
</tr>
<tr>
<td>LOW</td>
<td>Advanced Building Craft</td>
<td>General Studies</td>
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**FIGURE III A.** A 'Systems approach' Priority diagram - to assist in measuring Technician course priorities on a Cost / Benefit basis.
approach of relating budget to output rather than functions.

The next phase would be to determine priorities and must be understood to be a complex task; even in well-developed organisations this phase is no mean feat and often, particularly with regard to service institutions, considerable difficulties are encountered in respect of defining criteria - however it is in the analysis and surmounting these difficulties that a thorough knowledge of the organisation is gleened, leading to the necessary objectivity. Much experimentation is taking place with the development of cost/benefit analysis in this context, using priority indices and the like - albeit initially much good is to be gained from using simple systems analysis techniques such as those shown in Figure III A & B.

This type of analysis could be further enhanced into a useful input - output matrix if careful compilation of statistics were to take place in conjunction with market research techniques of requirements and utilization. In the extreme, indices or coefficients could be
- they need better people;
- their objectives and results are intangible.

*ALL THREE ARE ALIBIS RATHER THAN EXPLANATIONS*" (1)

Policy

Much mention has thus far been made of policy without clearly defining what it is or at least, should be understood to mean.

In his book 'Management, its nature and significance' Brech states:—

"To be effective a business — or any other organisation for that matter — must know what it is doing, and where it is going and what its strengths and weaknesses are; and this is what 'policy' is all about. Policy can therefore be defined as 'the objectives, the mode of thought and the principles underlying the activities of any organisation or institution'; it has the character, clearly, of guide-lines for effective accomplishment".

1. The capitals are my own innovation on Druckers quoted text
My primary concern is that although opinions have been expressed that there is generally a lack of direction at Ministerial level with respect to technical education, the Government policy as previously outlined and demonstrated in Section II pages 4 & 5, is reasonably coherent and despite being loose provides an adequate starting point for objective management – indeed it may be that the policy is deliberately 'so loosely' stated in order to provide a wide enough scope for the Ministry and more particularly the tertiary sector and its institutions to use their specialised knowledge and expertise in order to better judge and manage the requirements at source, where they are more intimately in contact with the problems, needs and possible solutions.

What does appear to be lacking is the will and more importantly the ability to analyse the broad policy and turn it into a series of objectives for action, monitoring and control. In mitigation it must be stated here in fairness that time, finance and adequately skilled human resources have perhaps been lacking due to misunderstandings or the total lack of awareness of these essential management principles.

As a final note on policy and in the above
context, Brech says:-

"Reference can be made to another viewpoint which emphasises policy as "the norms", with the emphasis placed on the "regulatory" factor, i.e. policy as the basis of control. This is of course only another way of describing policy as the foundation of effective management, because 'control' is what management is all about".

Budgeting versus Objectives.

It has previously been mentioned that the major preoccupation in the relevant and related Ministries in respect of education has been with 'budgetary' rather than the 'strategic planning' issues. It would however from a modern management theory stance appear paradoxical to consider budgeting without knowing objectively what is being 'budgeted for' and logically this leads one to suppose that conflict is likely as a consequence. i.e. The various institutions would be better able to effectively manage, allocate and control budgeting and costs if they could see more clearly or objectively exactly 'what' they were budgeting for in terms of outcomes.

to quote Drucker again:-
"setting and balancing objectives does
require mechanical expression. The budget is the instrument, and especially the budget for managed and capital expenditures.

If the company is to succeed, the expenditures have to express the same basic decisions on survival objectives. But no matter how large or small the sums (of money being spent), decisions on the managed expenses determine the future of the enterprise".

And on misdirection of an organisation by the inappropriate use of the budget, Drucker says:

"The one basic difference between a service institution and a business is the way that they are paid. Businesses (other than monopolies) are paid for satisfying the customer. They are paid only when they produce what the customers want and what they are willing to exchange purchasing power for; satisfaction of the customer is, therefore, the basis for assuring performance and results in business. Service institutions are typically paid out of a budget allocation. This means
that they are not paid for what the taxpayer and customer mean by results and performance. ......... The typical service institution also has monopoly powers. The intended beneficiary has no choice. Most service institutions have power beyond what the most monopolistic business enjoys. ......... But effectiveness even more than efficiency is endangered by reliance on the budget allocation. It becomes dangerous to raise the question as to "what the business of the institution should be" - the question and answer is always controversial. The controversy is likely to alienate support and is therefore shunned by the 'budget based institution'. At best the institution may achieve effectiveness by deceiving the public and itself ".

With respect to the tangibility of goals for service institutions Drucker has this to say:-

"The most sophisticated and, at first glance, the most plausible explanation for the failure of the service institutions to perform is that ......... the objectives of
such service institutions are intangible and so are their results. This is at best a half truth. ......... The definition of 'what our business is' is always intangible - for a business as well as for a service institution.

Drucker goes on to cite some seemingly intangible definitions in answer to the question 'what is our business?' for a wide variety of businesses, the answers to which question have enabled them to derive measureable goals and targets for such alleged intangibles, and then he states:-

"Specific targets can also be derived for the apparently even less tangible goals of service institutions. There will surely be dissent and controversy before a workable definition is found. Service institutions have many constituents. The school is of vital concern not only to children and their parents, but to teachers, to taxpayers, to the community at large".

In the context of tertiary education in Kenya, it
is pertinent to point out that this is of concern to students, employers, the family system, the education sector generally and 'Nation-building' and National Development in particular when considering the amount of monies allocated to it in terms of the 'whole' education budget.

To conclude on objectives and the service institutions we return to Druckers contention that:-

"To make service institutions and service staffs perform does not require genius. It requires first clear objectives and goals, next it demands priorities on which the resources can be concentrated. It requires further, clear measures of accomplishment. And finally it demands organised abandonment of the obsolete. And these four requirements are just as important for the service staff of a business as for the service institutions and their staff in society".
Objectives and Strategic Planning.

Definitions

Objectives - Describe or define what is being sought after, or that which requires accomplishment.

Policy - As has already been outlined elsewhere, policy describes the major features or limitations of how the accomplishment will be achieved.

Strategy - represents the conscious deliberation and decision to initiate certain actions, directed towards certain purposes and supported with known or assessed resources and facilities. i.e. A company or institutions basic approach to achieving its overall objectives.

What we see in Kenya's tertiary education sector is a series of decisions which are not wholly strategic in that they are not inter-related in a cohesive long-term policy and strategy. In education as with most other organisations, the time-scales from conception to implementation and thereafter the 'production runs' for any project are often in terms of decades. In order to maintain flexibility
therefore, objectives and strategies must be defined in order to make sure that resources are effectively directed.

In this context Drucker says:—

"Practically every basic management decision is a long-range one—every major management decision takes years before it is really effective ...... and it has to 'pay off' the investment of people and money. Managers therefore need to be skilled in making decisions with long futurity on a systematic basis.

The idea behind long range planning is that the question 'what should our business be?' can and should be worked upon and decided by itself, contemporarily with, but independent of 'what is our business?'.

Long-range planning should prevent managers from extending present trends into the future, from assuming that today's products, services, markets, will be the products, services, markets of tommorrow, and above all, from dedicating their resources and energies to the defence of yesterday.
Everything that is 'planned' becomes immediate work and commitment.

On the misguided conception of strategic planning equating to forecasting he goes on to say:-

"Strategic Planning is necessary precisely because we cannot forecast . . . . . . . Indeed the central (entrepreneurial) contribution . . . . . . is to bring about the unique event or innovation that changes the economic, social or political situation."

Particularly in terms of Kenya and the contribution of tertiary education to the 'National wellbeing' and development, the above points are of paramount importance since it is largely through appropriate education that expansion of the commercial and industrial economies, and thereby the bureaucracy can take place.

However it is prudent to include a salient note here with regard to strategic planning in isolation, being the panacea for development 'ills' and Drucker cautions thus:-
"The best plan is only 'good intentions' unless it leads into work. What makes a plan capable of producing results is the commitment of 'key' people to work on the specific tasks. ........ The aim of strategic planning is action now."
Section V

Government Initiatives with respect to Tertiary and Vocational Education.

Having outlined the general aims of the various tertiary level technical institutions, both existing and proposed, in Section II and thereafter attempting to draw on the relevant modern management thought and techniques which are capable of addressing the problems posed, in Sections III and IV, it must now be forcefully pointed out that the Government has not remained insensitive to the problems of education generally nor those of a tertiary and/or vocational nature in particular. Much of the "gut" feeling, which originally prompted me to investigate the particular area of management study contained in this thesis, which I have in respect of the current 'ills' within the sector and which are expressed in Section III and also in the conclusions, have in fact been highlighted at Ministerial level and above; in particular this awareness has come about as a result of the findings and subsequent report of the 'National Committee on Educational Objectives and Policies' (N.C.E.O.P.). The goals of the committee, which was set up in December 1975, were:-
" ........ to evaluate the present system of education, define a new set of educational goals for the second decade of Independence and formulate a specific programme of action for achieving those goals"

and the report was presented and published in December 1976.

Since my researches have lead me to focus upon a series of problem areas which require urgent action and which largely concur with many of the findings, specific problems and recommendations of the N.C.E.O.P., I have chosen hereafter to incorporate a number of their comments in the body of this thesis and thereby give my endorsement to those comments and recommendations and furthermore in some cases add my own additional comments and discussion input as appropriate.

1. Manpower Development.

On this subject the commission had the following comment to make:-
" .......... The urgency of the need for high and middle level manpower has diminished considerably since Independence and the rate of expansion of secondary and tertiary levels of education can be reduced toward the requirements for normal growth.

The current nature of education and training, combined with a wage structure which disproportionately rewards academic schooling, has produced a distorted pattern of skill provision. This is exacerbated by the lack of coordination and direction within the Government in provision of training and skill development.

Increasing capability for self-employment has subsequently become a necessity at all levels of social and economic development has taken those features into consideration".

It is quite evident that the need for better control and quantification of commerce and industries needs for further education was felt by the committee. This need resulted in the following important recommendations:-
Recommendation 75. Consolidate and establish a pattern of preparation which takes explicit account of the ultimately desired ratios between Craft, Technician and Technologist - Graduate skills on the basis of a skill pyramid which is relevant to National needs.

Recommendation 77. To concentrate on acquiring an intimate knowledge of the extent and nature of existing training provision of all kinds including the non-formal, and of current and projected demand and supply position, both quantitative, in the market for skilled labour including the demand for replacement of foreigners.

Recommendation 78. To publish on an annual basis manpower and vocational education statistics and to use job analysis and tracer studies more widely.

All of the recommendations (75, 77 & 78) stated above are essential to good educational management and the need for them to be implemented has been adequately illustrated in earlier sections; in practice however my research has lead me to conclude
that in essence these recommendations are not being carried out. e.g. The lack of adequate data for contemporary analysis - in this context one of the most alarming aspects is the fact that both the Jomo Kenyatta C.A.T. and the Final Report for the proposed third Polytechnic at Eldoret have been justified on the basis of the estimated projections of the existing Polytechnics where that data in itself is by no means conclusive; furthermore they are based on todays need not on 'tommorows'.

2. Appropriate Technology and Skills.

Section 10.1 " " The committee notes with concern the tendency to base vocational training on the immediate needs of the 'modern sector' of the economy. The general objectives of post-school technical education should therefore be to facilitate the social and economic development of the rural areas of the country by providing badly needed technical personnel (in those areas).

In building technology for example, it is

1. See Section IV page 31,32 &33.
expected that the technical personnel will facilitate the development of the type of construction which makes better use of local materials and local labour and which produces the type of houses that are related to the needs of the people for whom they are built."

Very little can be said that would add to the appropriateness of the above comments since they speak for themselves. However it is pertinent to mention here that in some ways the various branches of vocational education are themselves made 'prisoner' by other constraints. For example in the context of building technology and the syllabus for building construction, the teaching is highly restricted due to the contingencies of such codes and documents which control the environment such as 'The Kenya Building Codes' which in themselves are inflexible in terms of 'appropriate technology'. However this restraint in itself raises other issues like the debate with regard to whether education should precede or follow technology - an important and controversial matter which will not be entered upon in this thesis.
3. General Policy and Administration.

With reference to the coordination of the whole area of education and in the interest of national goals and unity, the committee in Section 15.2 covered both policy and implementation by stating:

Clause 15.2.1. "...... The committee also urges the Government to do everything possible to develop education and training in an increasingly integrated manner and in close relation to the planned and existing national development needs."

and following in consequence of the above comment, makes these recommendations:

Recommendation 294. "To develop education and training in an integrated manner and to allocate funds to education and training to after taking explicit account of needs in all levels."

Recommendation 295. "To give a large measure of delegated authority to various agencies managing education in the field."
Clearly then the above state recommendations are meant to vest sufficient powers in certain selected educational establishments to enable them to be flexible to the needs as they appear 'at grass roots level' - it necessarily implies however that assessment of these needs is the responsibility of the individual institution(s) concerned and this must of necessity include data collection in terms of market surveys, interpretation and thereafter long-term planning and setting of strategy.

4. Goals and Programmes of Action

The committee had written into its 'terms of reference' a brief to show considerable restraint in terms of recommendations on finance and recurrent expenditure on education and this figures largely in Section 17.2 which is here considered. In this context, the equitable 'right' to basic and primary education for every child is heavily emphasised - however the report goes on to state:

" .......... Many of the urgent high and middle level manpower requirements which were so apparent at Independence have now been met
....... There are still a number of jobs with a science/technology base where there are further opportunities for qualified Kenyans. Nevertheless, for the great majority of school-leavers of the future, self-employment, mainly in the rural areas offers the best hope for earning incomes.

In the light of these findings by the committee they went on to recommend as follows:

Recommendation 68. "To orientate national development towards employment generating areas to absorb the products of education".

Recommendation 327. "To ensure that budgeting, allocation of resources and control of expenditure are responsive to the needs of equity, relevance and quality of training".

In terms of recommendation 68 regarding tertiary education, this I feel requires some modification in as much as the products of technical education should exist precisely because of employment existing or perceived to be likely in the future (and based on manpower requirements statistics), or at the very
least the form of education ought to be such as to encourage the successful students to be 'creative' in the sense of self-employment.

Recommendation 327 is important and paramount in terms of management since it demands the attention of those concerned with the management of educational institutions in terms of clearly demanding definitions of objectives, accurate long-range planning and strategy. More will be said in this regard in Section VIII.

Whilst the above comments and extracts have been concerned with education generally, the committee moves on in some of its later findings to deal specifically with technical education and training, pointing out the seemingly inequitable distribution of the educational budget and funds, thereafter calling for a major review of costs and patterns of expected reward. As such then the statements which follow are interesting:-

"The committee believes that the provision of technical education will be seriously distorted if the Ministry of Education continues to pay most of the costs, .........". (for higher
level technical and vocational education).

Indeed although no figures are available to substantiate, it is my belief that if costs of tertiary technical education were more equitably dispersed through less subsidy on the part of the Government and by a greater percentage being charged to the sponsor then rationalisation of numbers of enrolments would be automatic. The existence of the National Industrial Training scheme and consequent training levies based upon company returns may well adversely influence employment figures for trainees and 'prop up' a seemingly continuous demand for technical education. Suffice it to say that in the absence of realistic figures for demand after successful completion of courses, no clear cut confidence in the correctness (or otherwise) of current levels of enrolment and registration nor more particularly, current trends, can be reasonably assumed.
Section VI.

Problems associated with the implementation of Action and closer control of Management of the tertiary technical and vocational education sectors.

The need for Strategic Planning

The initial search for objectivity in the field of tertiary education can to some extent be considered to have been answered by the recommendations of the N.C.E.O.D.; what would now appear to be at the root of the problem thereafter is the ability and willingness to turn these general educational objectives into specific objectives (which is what objectivity is all about—detail), based on measurable targets and as such therefore a basis for a clearly designed strategy. In section IV the terms 'policy', 'objective' and 'strategy' have been clearly defined and their separate and conjoint importance in management of any area or entity has been clearly underscored.

Indeed in his book 'Management' under the topic of 'the limits of public policy', Drucker
has this to say:—

"Capitalists and Socialists agree that where the market cannot provide a performance 'test', public policy will provide guidance and control. As our discussion of the impact of the budget basis shows, this is not nearly enough. To be sure, service institutions ...... must be controlled by policy. But they need more than programmes, promises, good intentions, and hard work, all underwritten by a budget. Where ever possible, they need a system and a structure that directs them towards performance.

Service institutions also need the discipline of planned obsolescence and abandonment of their policies".

Also Brech in his book (previously referred to), talks of planning and control as being obverse functions regarding the ascertainment and assessment of all relevant facts stating that:—

"The effectiveness and economy of
activities and operations are controlled by a continuous comparison of actual achievements of results against (these) predetermined standards. The selection of personnel, equipment, materials, methods, processes, etc., to be used in carrying out the operations, should be based on a continuous review of all relevant factors, and determined on an analytical basis.

Applying the theory to the situation under study, it becomes obvious that data for effective management is just not available and that for this reason change is not taking place to meet the demands of commerce, industry and the Nation, since these demands are not clearly made obvious to the policy implementors.
Section VII.

Relevance of findings of Dr. Kemp's report. (1)

Although the purpose of the Kemp study is different to the one for this thesis, a great deal of common ground is apparent and it is therefore useful to draw upon many of the findings and statistics found in the report. The purpose of the report was:

"To evaluate the effectiveness of the British technical cooperation programme of assistance towards manpower development at the Kenya Polytechnic".

Hereafter I shall quote from the report under appropriate headings and subsequently discuss and comment upon the importance of these findings to the current study.

Growth Projections

"Of late even the growth aspect of the
current plan (1978-1983) has been revised downwards in the face of Balance of Payments problems and general World recession. The result is now a strategy to develop more local resource based and labour intensive industries with an accompanying shift from large scale Capital to more food crop production and basic infrastructural projects”.

How this shift is reflected in a change of direction in the technical education field is still not, to date, apparent when one considers that the courses offered at the Polytechnics (and to a lesser extent at J.K.C.A.T.) are similar to those proposed and approved in the late 1960's and early 1970's; this situation cannot therefore be considered in any way to fulfill the Government policy with regard to 'flexibility'. Furthermore a most important aspect to be considered is the motivation and 'wellbeing' of the students, post-qualification, if their talents and knowledge are not put to effective use or more especially if it is redirected due to shifts in National goals - a situation which seems clearly to be indicated by those comments made above and others made elsewhere in this paper.
Wage Employment Expansion versus Enrolments

Statistics are provided to show that the annual rate of expansion of wage employment in the modern sector of the economy is shown to be 6.3% in the public sector, 4.5% in private commerce and industry and 3.8% in private agriculture (1). This contrasts significantly with enrolments of the national Polytechnics for many years, including the period covered by Kemp's report - in some cases the growth in registration and enrolment is in excess of twice the corresponding sectors' wage employment growth rates. (2). Indeed in many areas of tertiary education, the greatest demand for student enrolments has stemmed from the public rather than the private sector, whilst Kemp points out that the rate of capital formation in private and public sectors has been 12.6% and 0.1% respectively.

Continuing Education

Concerning flexibility and the need to fulfill Governments objectives as well as utilising

1. See appendix I.
2. See appendix I
the knowledge of experienced personnel, it is interesting to note Kemp's own comments that:-

"In general there are few openings in the Polytechnics for the more mature, experienced individual who does not possess E.A.C.E. ....... This general problem of accessibility was recognised in the Gachathi commission report and it was stressed that the Polytechnics must widen their scope for admissions".(1).

Employer sponsorship and relationship of courses to industrial needs.

One of the most alarming aspects of a detailed survey of demand for technical courses is given in the following comment abstracted from Kemp's report:-

"The actual pattern of sponsorship ......... is given in table 14 (1) ........ with the private sector is included here parastatal organisations. However if they

1. The existence and operation of J.K.C.A.T. has done nothing to ameliorate this situation.

2. See appendix A
(parastatals) are counted as part of the public sector, this significantly increases that sectors share; for 1977 such an inclusion at the Kenya Polytechnic results in approximately 64% of all students being in public sector employment. In some departments and courses this figure can rise to over 90%" ....... The Polytechnics have a virtual monopoly for the training of skilled technicians in Kenya. This means that they must be all the more alert to the demands of industry; there is thus a need for regular communication with employers at all levels ....... But again due to the prevailing monopoly, course attendance patterns may not necessarily indicate demand or appropriateness, eg. an employer sponsoring over 90% of participants on one of these courses commented that the course was "too academic" but that no alternatives existed. Obviously educational institutes will always be open to such criticisms by employers; The training objectives of the latter are always very specific and limited to a need currently felt, rather than one likely to develop in the future".
Indeed throughout the report areas of doubt regarding supply and demand are met with and a clear need for "market research" and analysis is clear in terms of course content, patterns of attendance, size of intake, et alia. Also, the problem of lack of communication between institutions and employers is stressed with the emphasis being on the need and ability to control output to defined demand requirements.
Section VIII.

An analysis of the situation in tertiary technical education in Kenya - Problem areas:
Conclusions and Recommendations.

In sifting through the available reports, the very limited data on manpower requirements and post-qualification employment and from the wider experience gained as a result of "interviewing" as well as my personal experience in working in this sector over the past four years, a series of shortcomings from a resource management point of view can be isolated and they are as follows:

1. Liaison and cooperation between the various institutions (both existing and proposed) is not sufficient to ensure efficiency and effectiveness.

2. Liaison between industry & commerce and the tertiary technical education institutions requires considerable improvement as a means of monitoring performance and aiding future strategic planning of the individual institutions.
and thereby upwards to the sector in general.

3. There is a dearth of accurate, appropriate and therefore meaningful statistical and other data such as is required to make sensible 'current' and 'future' management decisions, available in terms of industrial and commercial manpower requirements relative to technical education.

4. As a result of the lack of available data, concrete justification of many existing and proposed programmes is not available.

5. Due to the fact that insufficient information is available, clear aims and objectives for institutions and specific courses have not been drawn up with the result that:
   a) Direction of such institutions is difficult.
   b) Much duplication of effort is made and as a result scarce resources are being wasted.
   c) Control of the sector is becoming increasingly more difficult.

6. Too rapid expansion of the sector is putting excess of strain upon the human resources available for teaching and is thereby causing
'conflict of interest'.

7. The Government requirement for flexibility is not and cannot, under the present prevailing situation, be fulfilled - with the result that National goals are being compromised and as such may not therefore be achieved in the manner demanded. This is due to the fact monitoring and control systems are not being initiated.

Recommendations.

The requirement for the existing 'budget based management' for any Government service is without doubt; however the very existence of a budget does not necessitate a system whereby the aim is to ensure that money allocated is spent - the aim should be to allocate and thereafter apply the available finance to the individual or specific objectives in the most cost effective manner - having first decided upon levels of priorities and the inter-action of the various objectives upon each other.

In order to carry out successfully such an important function as stating the aims and objectives of a Government or Ministerial sector however, accurate and appropriate data and consequently
information must be made available. The prerequisite for improvement must thus be :-

To carry out (and systematically update) a thorough manpower analysis of industry, commerce, parastatal, and local and national Government employers, in order to identify current needs, obsolete educational practices and to give basic and appropriate criteria for long-term and strategic planning - with a view to ensuring that technically trained personnel meet the current and projected needs of industrial, commercial and Government employers manpower requirements.

Considering the higher technical education sector covered by the body of this thesis, the second phase in setting up a more effective management system is to define the primary outputs at all levels of the sector with the objective of being able to specifically define or state objectives which can be measured and controlled at those various levels - such that cooperation between factions such as departments, institutions and other 'such interest' groups is obtained. This will facilitate the controlling body
(Ministry) to monitor 'National development appropriateness' and thus maintain overall effective control whilst at the same time giving plenty of scope for management initiative at both institutional and departmental levels; The second requirement can therefore be defined as a recommendation for:-

A global programme classification structure for the tertiary technical education sector, showing the relationships from Ministerial through to programme elements. (1).

Since the major shortcoming of the present management system of the sector in particular has been shown to be a lack of well developed objectives and also considering the fact that the sector must remain as a budgeted service sector, it seems appropriate to apply management techniques developed under the title of Planning, Programming and Budgeting Systems, (P.P.B.S.), which have been applied highly successfully to service institutions in the past twenty years or more. (1)

1. See appendix B Figure II, for sample illustration
This therefore leads to a final recommendation as follows:

To systematically develop a management methodology for (initially) higher level technician education to cover the National Polytechnics. The management techniques to include the use of a Planning, Programming — Budgeting System with objectives for each area or programme being designed accordingly; this latter could be considerably enhanced by the use of cost-benefit and cost-impact analysis techniques for determining resource allocations and priorities.

Appendix B contains some basic techniques and explanation, at a basic level, regarding the development of such a system for use within the framework of P.P.B.S. for the benefit of the reader and such techniques would provide a foundation for the further research and development of the system proposed. The

1. An introductory treatise of this is given in Appendix B
advantages which may be expected to be derived from the application of such a system to tertiary technical education may be outlined as follows:

1. A greater commitment to the aim(s) of the total organisation as a result of increased objectivity and each person seeing more clearly his individual role.

2. The synergistic effects of personal involvements, in long term planning at the various levels.

3. More realistic and priority orientated use of public and private funds.

4. A series of 'strategy packs' will naturally result from the objectives resulting in the various sectors having their own 'action plan'.

5. Tighter management control systems.

6. Greater flexibility, enabling shifts of emphasis to take place in an ever changing environment.

7. Despite the cost of collecting data and carrying out necessary market research and monitoring, great savings
are certain to be made as a result of avoiding wasteage of resources, (aid money particularly), unnecessary duplication and the negative aspects of 'power struggles' within the sector. (Wide experience of the application of such systems to service sector applications have consistently proven to show considerable cost reductions).

8. Such a system would link in naturally with modern educational developments of 'learning objectives', if and when these are fully developed and implemented in Kenya.

However the introduction of such a system logically would not be initiated without experiencing certain problems and therefore it beholds one to point out these likely areas of conflict or controversy in advance; some of the most important being:

1. Problems associated with interfacing the current financial and budgeting systems, with allocation based on past expenditure – expenditure
inputs, as used currently in the Government sector, with the performance orientated emphasis of P.P.B.S.

2. The current organisational structure is functional and a change to that recommended would result in a breakdown of 'interest groups and power bases' which is certain to be met by serious opposition.

3. Lack of availability of suitably qualified personnel for the analysis and implementation of such a scheme.

4. The conservative nature of educationalists and bureaucrats, which would necessitate large scale 'education and selling' of the ideas at all levels - this being a necessary prerequisite in terms of absolute commitment to the system.

5. Reconciliation of projects in institutions with conflicting objectives.

6. Authority patterns may be difficult to define in the case of joint pursuit of the same or similar objectives.
APPENDIX A.

**Approximate Student Recreation Pattern**

<table>
<thead>
<tr>
<th>Activity</th>
<th>M-F PM</th>
<th>M-F AM</th>
<th>Sat</th>
<th>Sun</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>24</td>
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<tr>
<td>Other</td>
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<td>15</td>
<td>54</td>
</tr>
<tr>
<td>Building</td>
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<td>9</td>
<td>13</td>
<td>9</td>
<td>43</td>
</tr>
<tr>
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<td>52</td>
<td>103</td>
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<td>12</td>
<td>42</td>
</tr>
<tr>
<td>Drawing</td>
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<td>18</td>
<td>30</td>
<td>19</td>
<td>72</td>
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<td>Social</td>
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<td>45</td>
<td>50</td>
<td>40</td>
<td>186</td>
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<td>453</td>
<td>385</td>
<td>357</td>
<td>1,662</td>
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</tbody>
</table>

Note: Data compiled from Johnson's report.
DEFINITIONS OF FULL TIME EQUIVALENTS (FTE).
(Extracted from Kemp's report)

This follows the outline proposed by Keith Reed in his report (No 5) relating to his visit to Kenya Polytechnic in March 1980.

Attendance During Term  FTE count per student
1. Full Time, 3 terms  1.0
2. i. Sandwich, 2 terms  0.9
   ii. 1 term  0.5
3. Part-time day, 3 terms  0.15
   i. Per morning  0.15
   ii. Per afternoon  0.15
   iii. Per evening  0.15
4. For full-time and part-time courses lasting more than a full session multiply the count per student by the duration in weeks and then divide by 33.
5. For short courses express each course as equivalent weeks duration (e.g. a 1 day course is equivalent to 0.2 weeks duration). Each student then counts 1.5 times the duration divided by 33.

Kenya Polytechnic: Student Sponsorship Pattern. *
(Figures relating to Term 3 1978)

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<th></th>
<th>Government</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<td>Mech Eng</td>
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<td>175</td>
<td>46</td>
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<td>83</td>
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<td>Building</td>
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<td>36</td>
<td>16</td>
<td>8</td>
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<td>Science</td>
<td>58</td>
<td>106</td>
<td>61</td>
<td>11</td>
<td>9</td>
<td>117</td>
<td>362</td>
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<td>Bus' Studies</td>
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<td>37</td>
<td>53</td>
<td>42</td>
<td>17</td>
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<td>40</td>
<td>10</td>
<td>5</td>
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<td>139</td>
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<td>0</td>
<td>0</td>
<td>2</td>
<td>22</td>
<td>100</td>
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<td>Gen. Studies</td>
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<td>4</td>
<td>0</td>
<td>3</td>
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<td>48</td>
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<td>TOTAL</td>
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<td>202</td>
<td>453</td>
<td>137</td>
<td>88</td>
<td>462</td>
<td>1,969</td>
</tr>
</tbody>
</table>

Sp = Sponsored;  S/Sp = Semi-Sponsored;
O/S = Overseas;  Pr. = Private.

* Extracted from Kemp's report.
FIGURE I.

THE KENYA POLYTECHNIC.

Full time equivalent enrolments for the six major Industrial/Commercial Departments. (1971 to mid 1983).
### Student Enrolment Statistics
**(Extracted from Kemp's Tables 11, 12 & 13)**

#### Kenya Polytechnic:

<table>
<thead>
<tr>
<th>Year</th>
<th>Mechanical</th>
<th>Electrical</th>
<th>Building</th>
<th>Science</th>
<th>Business Studies</th>
<th>Printing</th>
<th>Institutional Man'</th>
<th>General Studies</th>
<th>Total</th>
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<tr>
<td>1974</td>
<td>330</td>
<td>176</td>
<td>260</td>
<td>145</td>
<td>295</td>
<td>24</td>
<td>59</td>
<td></td>
<td>1,339</td>
</tr>
<tr>
<td>1975</td>
<td>249</td>
<td>170</td>
<td>270</td>
<td>151</td>
<td>250</td>
<td>42</td>
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<td></td>
<td>1,203</td>
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<tr>
<td>1976</td>
<td>303</td>
<td>198</td>
<td>239</td>
<td>154</td>
<td>242</td>
<td>38</td>
<td>73</td>
<td>2</td>
<td>1,194</td>
</tr>
<tr>
<td>1977</td>
<td>262</td>
<td>162</td>
<td>229</td>
<td>170</td>
<td>260</td>
<td>37</td>
<td>72</td>
<td>2</td>
<td>1,319</td>
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<tr>
<td>1978</td>
<td>262</td>
<td>174</td>
<td>244</td>
<td>193</td>
<td>258</td>
<td>45</td>
<td>92</td>
<td>2</td>
<td>1,606</td>
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<tr>
<td>1979</td>
<td>326</td>
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<td>278</td>
<td>241</td>
<td>360</td>
<td>54</td>
<td>98</td>
<td>77</td>
<td>* 1,606</td>
</tr>
</tbody>
</table>

**TOTALS**

1,339  1,203  1,249  1,194  1,319  1,606

* 40 students in Library Dept. Included in '79 total.

(Average attendance over three terms)

#### Kenya Polytechnic:

**Student Attendance Pattern**

**Third Term 1978:** Actual Enrolments

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**FTE TOTAL**

1,479

#### Mombasa Polytechnic:

**Actual Enrolments 1979**

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KENYA POLYTECHNIC: Main sponsors by Department. (Figures relate to
Term 3, 1978 Student Enrolment) *

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NB. This is only a selection of the main sponsors.

* Extracted from Kemp's Report.
### Relevant Kenya Statistics *

#### 1. Economic Growth 1964 – 77

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<th>Annual Average Rate of Growth (constant 1964 prices)</th>
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<td>Building &amp; Construction</td>
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(*) Extracted from Tables 1 & 2 in Kemps Report)
Expenditure on education is extremely important in the Kenyan economy. The Ministries of Basic and Higher Education alone account for 25 per cent of central government's current expenditure and households devote a high proportion of their spending to the cost of schooling and to the construction of self-help (Harambee) schools, the current financing of which is often eventually taken over by government. The table below summarises current and capital expenditure on education by various agencies in 1980/81.

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<td>Self-Help Projects ('79)</td>
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<td>Foreign Aid Projects*</td>
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* Included in Ministries' total


For comparison with the figures shown above, the total central government recurrent budget in 1980/81 was K£646.6 million, the development budget K£303.7 million and gross domestic product in 1980 K£1,582.0 million.


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(Ex. Table 2.2.21 in 'Eldoret Polytechnic Final Report')
With regard to the previous data, the proportion of the total accounted for by personal emoluments of administrative and technical staff and by teachers salaries is high in all cases (56 per cent for technical schools, 57 per cent for Kenya Polytechnic and 47 per cent for Mombasa Polytechnic); it would be even higher if the full cost of expatriate staff were included. However, it is lower than is the case in non-technical institutions; for instance, the proportion for maintained secondary academic schools is 66 per cent. This reflects the higher levels of expenditure on equipment, repair, maintenance and replacement of the part of the technical institutions, included in 'grants and grants-in-aid' as shown in the table 2.2.21.

Primary education accounts for the bulk of the recurrent expenditure of the Ministries of Basic and Higher Education, as is shown by the following Table (Again, extracted from the Eldoret Polytechnic - Final Report, Table 2.2.22), although the 'few thousand' university students are disproportionately costly.

The primary schools' share of development expenditure is much lower, since at this level most of the cost falls on the local community. The polytechnics' share of educational expenditure, particularly on recurrent account, looks unusually small.

### Estimated Gross Expenditure, Ministries of Basic and Higher Education, 1981/82. (As appeared in the Eldoret Polytechnic - Final Report, Table 2.2.22)

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