AN ASSESSMENT OF THE TEACHING AND LEARNING ENVIRONMENT IN GHANAIAN POLYTECHNICS UNDER THE TERTIARY EDUCATION REFORM PROGRAMME

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ABSTRACT

In 1992 the Ghana Government launched the Tertiary Education Reform Programme with the goal of revitalising and expanding the tertiary education sub-sector. This was in response to the decay that had hitherto characterised the educational system following the economic decline of the 1970s and early 1980s. Tertiary education policy and the development of the sub-sector are currently guided by the government's *"White Paper on Reforms to the Tertiary Education System"*. The principal objectives of the reforms were to:

- Reverse the deterioration of the system, falling standards and declining quality of education.
- Increase access to tertiary education.
- Establish a stable and sustainable basis for the financing of tertiary education.
- Create institutional capacities for quality monitoring and policy evaluation.

As a result of the reforms the polytechnics were elevated from second cycle institutions to tertiary status, with the fresh mandate of training the country's middle level manpower. In 1993, the Tertiary Education Project (TEP) was launched with the assistance of the World Bank and other donor agencies to assist in the implementation of the reform programme. Although the TEP has succeeded in improving the quality of tertiary education in the country to some extent, the polytechnics continue to face some major problems that militate against the realisation of their full potential. It is the realisation that the system is once again in danger of collapsing that prompted the present study. The focus of the study was therefore on how to sustain the quality of the teaching and learning environment in the polytechnics.

Five polytechnics were selected for the study, based on the stratified random sampling technique. Accra, Ho and Kumasi were selected from the first stratum of polytechnics that were in existence prior to the launching of the reforms, while Koforidua and Sunyani were selected from the second stratum of those that were established later. Both primary and secondary sources were used for data collection.

The major findings of the study are as follows:

- The quality of the physical infrastructure has improved considerably. However, all the polytechnics require permanent libraries and more workshop and laboratory equipment.
- The rate of increase in enrolment far exceeds the target, thereby putting a lot of pressure on the facilities, which might lead to further deterioration.
- The level of both financial and human resources are rather too low to guarantee quality education.
- There is the need to ensure a more effective management of financial resources through the deployment of the required level of resource to the critical areas of teaching.

A number of recommendations has been made as to the way forward. These include freezing enrolment at current levels, intensifying staff development efforts, and adherence to the norms that have been developed by the National Council for Tertiary Education (NCTE) for institutional development.

The polytechnics play a very important role in the training of national requirements for middle level manpower. There is therefore the need to adequately equip them if the nation is to realise its vision of becoming a middle level income country by the year 2020.

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ABBREVIATIONS

ADB	African Development Bank
CIDA	Canadian International Development Agency
DFID	Department for International Development
ERP	Economic Recovery Programme
GCE	General Certificate of Education
GDP	Gross Domestic Product
GES	Ghana Education Service
HND	Higher National Diploma
IDA	International Development Agency
JAMB	Joint Admissions and Matriculation Board
JSS	Junior Secondary School
KNUST	Kwame Nkrumah University of Science and Technology
MOE	Ministry of Education
NAB	National Accreditation Board
NABPTEX	National Board for Professional and Technician Examinations
NCTE	National Council for Tertiary Education
RECAAST	Regional Colleges of Applied Arts, Science and Technology
SAP	Structural Adjustment Programme
SRC	Students Representative Council
SSS	Senior Secondary School
SSSCE	Senior Secondary School Certificate Examinations
STR	Student/ Teacher Ratio
TEP	Tertiary Education Project
TEWU	Technical and Education Workers' Union
UCC	University of Cape Coast
UCEW	University College of Education of Winneba
UDS	University for Development Studies
UG	University of Ghana
UK	United Kingdom
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation

UNICEF	United Nations Emergency Children's Fund
URC	Universities Rationalisation Committee
USAID	United States Agency for International Development
VAT	Value Added Tax

CHAPTER ONE

INTRODUCTION

1.1 Background

Historically, Ghana's educational system was widely acclaimed to be one of the best and most widely developed in West Africa (Rothchild, 1991). The standard and quality of the system were comparable to those in the developed world. However, the economic decline of the mid-1970s and early 1980s had a very serious negative effect on the education sector just like all the other sectors of the economy. The major recession which began in the industrialised countries after the oil shock in the mid-1970s spread throughout most of the developing countries in the late 1970s and early 1980s. This led to balance of payments and budget deficits, which severely affected the capacities of governments to finance education (Hallack, 1990). The economic recession, austerity and political pressures compelled the governments of these countries, including that of Ghana, to shift resources away from education towards the other sectors of the economy. By 1983, the economy had hit rock bottom and the state was experiencing a fiscal crisis of severe proportions. In 1982/1983 government revenues were less than 6 percent of GDP. The inter-sectoral competition for funding exerted a lot of pressure on the government. Public expenditure on education fell from 6.4 percent of GDP in 1976 to 1.4 percent in 1983, well below the World Bank's estimate of average spending on primary education alone in Sub-Sahara Africa (World Bank, 1992).

The consensus was that the educational system was in crisis. The manifestation of the emerging crisis included escalation of costs and expenditure, declining quality, and the expression of doubts about the relevance of the curriculum for the development needs of the country. The situation was such that the government, which was the main sponsor of tertiary education in the country, was no longer able to provide new educational facilities or maintain existing ones even though enrolment had continued to increase. The little money that was available to the education sector was spent almost entirely on salaries. As a result school were without textbooks and other teaching and learning materials. Teachers were underpaid, resulting in the exodus of qualified teachers abroad and others were compelled to take on additional jobs in

other to survive the harsh economic climate. As a result of the inability of the government to provide enough resources to the sector, the quality of teaching and learning in the various institutions that make up the educational system deteriorated sharply. According to Rothchild (1991), as a result of this precipitous decline in quality, graduates at all levels in the educational system were widely regarded as ill-educated and inadequately prepared for economic life.

In order to reverse the downward trend and rebuild the quality of the system, the Ghana Government launched a sector-wide educational reform in 1987. The success of the Economic Recovery Programme (ERP) and the Structural Adjustment Programme (SAP) in restoring the fiscal position of the government coupled with the additional resources made available to the education sector by the donor community permitted a substantial and fairly rapid increase in the resources expended by the government on education. According to the World Bank (1992), the IDA and USAID have been the largest donors to the sector. IDA credit included the first Education Sector Adjustment Credit ($38.0m, 1986), the second Education Sector Adjustment Credit ($50.0m, 1990), the Community Secondary School Construction Project ($14.7m, 1991) and the Literacy and Functional Skills Project ($17.4m, 1992). The USAID has provided credit of $ 35m over a five-year period starting from 1990. A significant amount of aid has also come from CIDA and DFID (UK).

The principal objectives of the reform package were to reduce the previous inordinate length of pre-university education from 17 years to the international norm of 12 years, improve pedagogic efficiency and raise the quality and relevance of educational outcomes (World Bank, 1992). The tertiary education component of the reforms launched in 1992 was based on the report of the Universities Rationalisation Committee (URC). This committee was set up by the government in 1986 to undertake a reappraisal of the problems facing tertiary education in the country and make suggestions for improvement. The recommendations were later formalised in the *"White Paper on the Reforms to the Tertiary Education System, 1991"*. The government's policy on tertiary education as stated in the White Paper, is to revamp, recapitalise and expand facilities with the objective of improving quality, access and management efficiency.

As a result of the reforms, the six existing polytechnics at Accra, Cape Coast, Ho, Kumasi, Takoradi and Tamale were upgraded from second cycle institutions to tertiary status (Polytechnic Law, 1992, PNDC Law 321). The Tertiary Education Project (TEP) was launched in 1993, as part of the implementation strategy for the reforms. The project had two main components consisting of:

- A central component for the Ministry of Education and the proposed new boards of accreditation, admissions and examinations.
- An institutional component for the Universities and the Polytechnics designed to improve upon the quality of teaching and learning and also management efficiency.

The first phase of the tertiary reform programme (1992-1996) has ended and therefore there is the need for some stocktaking to assess whether any progress has been made towards the realisation of the government's objectives.

1.2 Problem Statement

The tertiary education reforms have succeeded in transforming the Polytechnics from second cycle institutions into tertiary ones and there is some agreement that the quality of the system has improved to some extent. However the question is whether the achievements recorded can be sustained and further improved upon. The Polytechnics continue to face some major problems that are seriously affecting the quality of the teaching and learning environment. These include the following:

- Inadequately Qualified Staff

The World Bank (2000) recognises the importance of the contributions made by a well-qualified and highly motivated teaching staff to the achievement of academic excellence in the polytechnics. To the Bank, staff numbers, qualifications and remuneration are central in determining the quality of teaching. However, staff recruitment and retention has become a severe problem in the polytechnics as a result of the unattractive salaries and other conditions of service. For example salary levels of polytechnic staff are well below those of their counterparts in the universities even though the basic requirement for teaching in both categories of institutions remain the same, namely, the MSc\MA\MPhil. Degree. As a result, the ability of the institutions

to retain qualified staff has become a persistent problem (World Bank 1994). Indeed very low salary levels act as disincentive to staff performance.

The polytechnics were expected to comply with academic staff/ student ratio norms of 1:18 by 1995/96 under the TEP. However they have consistently exceeded the norms. Staff/ student ratios were 1:24 in the 1994/95 academic year (World Bank 1995). This has serious implications for institutional capacity building and quality improvement.

On the qualification of staff, Girdwood (1999) states: *"it is a well-known fact that the level of qualifications held by the majority of Polytechnic staff are inappropriate for the level of teaching expected of them"(p.47).* There is still a considerable number of staff with qualifications below the second-degree level despite the attempts being made at staff development.

- Deteriorating Infrastructure

Increases in enrolment have not been accompanied by a commensurate expansion of the capacities of the polytechnics. Indeed the rapid expansion in enrolments coupled with the steadily declining real resources has put a lot of pressure on the existing inadequate resources. By the 1994/95 academic year the institutions had exceeded their enrolment targets (Girdwood, 1999). Overcrowding in classrooms, workshops and laboratories, and the lack of maintenance of plant and equipment have both contributed to the deterioration of facilities. It is expected that they will continue to face more pressure as large numbers of students who are unable to gain admission into the universities flood the gates of the polytechnics.

- Inadequate Workshop and Laboratory Equipment

The applied nature of polytechnic education requires that students undertake a lot of workshop and laboratory practicals. However these workshops and laboratories are not well equipped. Some of their students, especially the engineering ones, therefore have continued to rely on the University of Science and Technology for most of their practical work at a very great expense to the polytechnics.

- Inadequate Library Facilities

Library facilities in most of the institutions are clearly inadequate. Their collections are housed in classrooms and in some cases in the newly built Non-Residential

Students' Facilities. This defeats the purpose for which the facilities were built. Moreover, the libraries lack the equipment required for the information technology age and reference books and journals are out of date.

- Lack of Accreditation for Programmes

Programme accreditation is a very important means of ensuring that course offerings are of the required standard. Several years after their upgrading, the polytechnics do not have final accreditation from the National Accreditation Board (NAB) for their programmes. Some programmes have been given interim accreditation while others have been forced to suspend the intake of fresh students. This is particularly the case at Kumasi Polytechnic where the author has worked for a number of years.

1.3 Research Objectives

From the problems identified, the overall aim of this study is to determine whether the government's objective of improving the quality of polytechnic education has been achieved.

The specific objectives are to:

i. Evaluate the implementation of the tertiary education reform programme in the polytechnics.
ii. Identify the indicators of quality in tertiary education.
iii. Identify the weaknesses in the polytechnics, which inhibit the achievement of their objectives.
iv. Identify the possible causes of these weaknesses.
v. Make recommendations, which will enhance the capacity of the polytechnics to perform their key function of training middle level manpower for the country's development needs more effectively and efficiently.

1.4 Research Questions

In the light of the above stated objectives the main focus of this study is a search to find answers to the following questions:

i. Has the tertiary education reforms been able to improve the quality of educational infrastructure in the polytechnics? If yes, then how can quality be maintained, and if not, is there anything more to be done?

ii. Are the objectives of increasing enrolment and that of assuring quality education compatible?
iii. What are the major problems facing the polytechnics?
iv. In the face of dwindling resources how can the management of the polytechnics be improved in order to ensure efficiency?

1.5 Justification

Education contributes to human resource development in many ways and the nation's polytechnics are recognised as playing a key role in this respect and in the economic growth of the country. The polytechnics were set up with the objective of training middle-level manpower for the country's development needs. However, they cannot hope to fulfil this mandate when the quality of their product cannot be guaranteed. They have to a large extent been marginalized under the reform programme. This study is therefore justified on the grounds that it attempts to examine the problems confronting polytechnics and find solutions to those problems. The recommendations, hopefully, will serve as an input into Phase II of the tertiary education reform programme.

1.6 Research Methodology

- Research Design

This research is basically a longitudinal study designed to study the effects of the tertiary education reform programme on the polytechnics. As such current data on the key indicators of the educational quality are compared to the situation before the introduction of the programme. This is to allow for the tracking and analysis of change over the period.

- Sampling Design

There are at present ten polytechnics in the country, eight of which are fully operational. These are Accra, Cape Coast, Ho, Koforidua, Kumasi, Sunyani, Takoradi and Tamale. The other two, namely those at Wa and Bolgatanga will admit their first batch of students later in 2000. Out of the eight fully operational ones, six were in existence prior to the start of the programme while the other two came on stream after its commencement.

This study therefore relies on the stratified random sampling technique, with the selection of the sample from the two categories of polytechnics that are fully operational. A 50 percent sample size is drawn from the first category of polytechnics that were already in existence, while both new polytechnics are selected. This sample size is selected because of the wide geographical spread of the polytechnics across the country.

- Data Collection

The information base for the study was obtained through both primary and secondary sources. For the primary data collection questionnaires were designed and formal interviews conducted with Planning Officers, Academic Secretaries and a cross section of students of the polytechnics. In addition, informal interviews were also conducted with the Executive Secretaries of the National Council for Tertiary Education (NCTE), the National Accreditation Board (NAB) and the National Board for Professional and Technician Examinations (NABPTEX). For secondary data collection, available relevant literature on the subject was carefully reviewed. These include publications of the World Bank and UNESCO as well as unpublished reports of NCTE, NAB and NABPTEX.

- Techniques for Analysis

Data from the survey is presented in the form of tables while simple descriptive statistical techniques, such as averages and percentages are used to analyse the data.

1.7 Scope and Limitations

This study focuses on only the public polytechnics, that is, those that are funded by the government. This is basically because they are the ones that were given consideration under the reform programme package. It has not been possible to conduct interviews with employers to assess the performance of polytechnic graduates in the field due to time and financial constraints.

1.8 Organisation of Thesis

The thesis is organised into five chapters. This introductory part is Chapter One. It deals with background information on the topic, the problem statement, research objectives, methodology, justification, and limitations of the study. Chapter Two

provides definitions of key concepts and a review of the relevant literature on quality indicators for tertiary education. The tertiary education reform programme and its implementation are reviewed in Chapter Three. Chapter Four presents the results of the study and an analysis of the data from the field survey. A discussion of the major research findings, their implications and recommendations on improving the quality of teaching and learning are presented in Chapter Five.

CHAPTER TWO

CONCEPTUAL FRAMEWORK

2.1 Importance of Tertiary Education

Education is viewed as an investment in human capital. It is of paramount importance for economic and social development. According to the World Bank (2000), tertiary education promotes development in many ways including the following:

- Income growth:

It contributes to labour productivity, entrepreneurial growth and quality of life, enhances social mobility, encourages political participation, strengthens civil society; and promotes democratic governance. It does this by providing the environment in which new knowledge, which promotes development, is disseminated. Ultimately economic growth translates into better living standards for the people.

- Enlightened leaders:

Tertiary education endows leaders with the necessary knowledge, technical skills and confidence with which to confront the development challenges of the future.

- Expanding choices:

Development is fundamentally concerned with expanding the choices people can make. Tertiary education enhances social mobility and helps the talented to fulfil their potential due to the wide range of options that are available for study.

- Increasing relevant skills:

It contributes to human resource development in many ways. Tertiary education institutions have the main responsibility for training a country's professional personnel, including the engineers, doctors, managers and technicians who participate in the development, adaptation and diffusion of innovations in the economy.

According to the World Bank (1994), the development of tertiary education is positively correlated with economic development. That is, the greater the number of educated manpower, the higher the level of a country's development. For example, empirical evidence indicates that in 1995 enrolment ratios in higher education averaged 58% in high-income countries while that of low and middle-income

countries averaged only 10% (World Bank, 2000). Table 2.1 compares enrolment ratios in the different regions of the world. In Ghana, the tertiary education enrolment ratio is currently 1%.

Table 2.1 Higher Education Enrolment Ratios by Region, 1995

REGION	ENROLMENT RATIO
Low and middle income	**10**
• Sub-Saharan Africa	3
• East Asia and Pacific	7
• South Asia	6
• Europe and Central Asia	32
• Latin America and the Caribbean	18
• Middle East and North Africa	15
High income	**58**

Source: World Bank (2000), Higher Education in Developing Countries, Washington DC

In the developed countries, increasing the educational levels of the population is seen as essential for raising already high levels of economic and social well-being. In the developing countries, it is seen as a prerequisite for raising standards of living to the levels of those already enjoyed in the developed countries. It is for this reason that developing countries, including Ghana, have invested considerable resources in their higher education systems. However, the dilemma facing these countries is how to achieve a balance in the allocation of financial resources between investments in education and all other sectors of the economy.

2.2 Meaning of Tertiary Education

The concept of 'education' is based largely on the related processes known as 'teaching' and 'learning'. According to Curzon (1990) education is concerned with the handing down of beliefs and moral standards, accumulated knowledge and skills. Antwi (1992) agrees with this assertion and states that education is the most potent force that shapes people's knowledge, attitudes, perceptions, skills and personality. The purpose of education is to develop skills that would enable people and the communities in which they live to take charge of their own lives, earn their living and shape their own destinies (UNESCO, 1988).

The University Rationalisation Committee (URC) defines education as "all processes by which individuals, being equipped with knowledge, skills and the right attitude to the improvement of society, are able to contribute to the quality of their own lives and thereby act as catalysts for the development of the nation" (URC, 1988). It is apparent from this definition that education is directly linked to national development.

There are three levels of the educational system, namely, primary, secondary and tertiary levels. The focus of this study is on the tertiary level. Tertiary education can be regarded as including all post-secondary education (URC, 1988). The World Bank (2000) also defines tertiary education, which is synonymous with higher or further education, as including "*universities, teachers' colleges and higher professional schools requiring as minimum condition of admission the successful completion of education at the secondary level, or evidence of an equivalent level of knowledge*". By these definitions, the polytechnics are also considered as tertiary institutions.

2.3 Teaching

Teaching involves the provision of those conditions that directly promote effective learning. A typical dictionary definition of 'teaching' is that provided by Cassell's English Dictionary, that is, "*causing a person to learn or acquire knowledge or skill*".

Lefrancois (1985) states that teaching "*involves implementing strategies that* are *designed to lead learners to the attainment of certain goals* ".
(Cited in Curzon, 1990, p. 18)

It is apparent from the above definitions that teaching should be defined in terms related directly to the concept of learning. Curzon (1990), provides a very useful definition, which is "*a system of activities intended to induce learning, comprising the deliberate and methodical creation and control of those conditions in which learning does occur". (p.18).*

2.4 Learning

Most dictionaries only provide a general and superficial guide to the definition of 'learning'. A typical dictionary definition is "*knowledge acquired by study*"

(Cassell's English Dictionary). However, philosophers and educational psychologists have provided more specific definitions. Some of these are as follows:

(a) *'Learning is becoming capable of doing some correct or suitable thing in any situation of certain general sorts. It is becoming prepared for variable calls within certain ranges' (Ryle, 1983 cited in Curzon, 1990, p. 10).*

(d) *"The apparent modification of a person's behaviour through his activities and experiences, so that his knowledge, skills and attitudes, including modes of adjustment, towards his environment are charged, more or less permanently". (Curzon 1990).*

From the above definitions, three main characteristics of 'learning' can be identified.

- The nature of learning is inferred from changes in behaviour.
- Learning occurs as the result of given experiences that precede changes in behaviour.
- Learning involves behaviour potentiality

2.5 Teaching and Learning Objectives

The output of teaching is learning. According to Bourner and Flowers, (1997) the objectives of teaching and learning in tertiary education include the following:

- Disseminate knowledge

For most people the main purpose of tertiary education is to deliver information at a level beyond that which is possible at school. One of the features that distinguishes a tertiary institution is scholarship and therefore it is expected that the information and ideas that are conveyed are up-to-date.

- Develop the capability to use ideas and information.

The ability to apply a concept goes beyond mere intellectual assent to it. Indeed the capacity to use ideas and information involves moving beyond comprehension of a principle in the abstract, to an appreciation of its range of applicability, where, when and how it is appropriate to use it.

- Developing critical faculties.

Teaching students to use their critical faculties means that they will be less likely to be taken in by assumptions, assertions and unsupported statements.

- Develop the student's ability to generate ideas and evidence.

This objective complements the above one of developing the student's ability to test ideas and evidence. Developing creative faculties is as important as developing the critical faculties.

- Facilitate the personal development of students.

Personal development impacts in a major way on the effectiveness of people in their professional roles. Tertiary institutions offer the environment within which this takes place.

- Develop the capacity of students to plan and manage their own learning.

The rationale for this objective is well expressed by Zuber-Skerritt (1992) when he states that:

> *"Our ultimate goal in higher education must be to encourage students to be responsible for, and in control of their own learning, and to make the conceptual change from learning a science (i.e., a subject or discipline) to becoming a problem-solver independent of their teacher's attitudes and methodologies". (Zuber-Skerritt, 1992, p. 24)*

The ideas embodied in these words reinforce the old saying that "*if you give a person a fish you feed him for a day but if you teach a person to fish you feed him for a lifetime*".

The challenge to tertiary education is to strive to achieve as many of these objectives as possible. However, it has been observed that the falling level of resources to tertiary institutions in the developing world is restricting learning aims to only one outcome, that is, information dissemination.

2.6 Teaching and Learning Environment

The teaching and learning environment can be defined as the relationships among teachers, learners and content, including learning materials (Stahlke and Nyce,1996). The Commonwealth Secretariat defines this environment in terms of a system with inputs being transformed through educational processes into outputs of finished products (Commonwealth Secretariat, 1991).

The ***inputs*** in education are such obvious factors as school buildings, teachers, and materials. However, people often tend to overlook what is perhaps the most important

input of all to the learning environment, which is the student or the learner. It is possible to devise indicators of quality in connection with each of these inputs.

Education ***processes*** refer to the interactions in the school and classroom between the students and the learning environment, the teachers and with learning materials. It is also possible to design a few measures of education processes that could stand as indicators of quality, for example, the assessment of accreditation boards.

The ***outputs or outcomes*** are normally defined in terms of measures of attainment of the learners. In the tertiary education system the outputs are graduates.

It has been suggested that tertiary education administrators trying to improve quality have to use some sort of working hypothesis connecting inputs and actions with desired outcomes. This hypothesis should show how investments in inputs result in better education processes and in terms of more learning achievement. Simmons (1980) expresses this relationship in terms of the "education production functions". He concluded that the current technologies of formal education are inefficient in their promotion of learning and that additional marginal input of capital or labour may have little or no influence on the outcomes. However other studies have shown that it is very difficult to establish such relationships with scientific precision because of the many intervening variables, which tend to influence learning achievements (Commonwealth Secretariat, 1991). In spite of this difficulty, the consensus among the World Bank, UNICEF, UNESCO and UNDP is that quality improvement in education depends on the effectiveness of the teachers, the quality and quantity of teaching and learning materials, and good governance of the educational system.

2.7 Characteristics of an Effective Tertiary Education System

Effective systems of tertiary education tend to have a common set of characteristics (World Bank, 2000). These are as set out below:

- Stratified Structure:

Tertiary education institutions are not only expected to increase enrolments but also to improve the quality of education they offer. This calls for the stratified or hybrid educational system, which combines the goals of excellence and mass education,

educational affairs. This protection ensures consistency in academic decision relating to institutional leadership, curriculum or funding of research projects. One very important element of an effective tertiary education system is taking decisions based on merit, and this can only be achieved when partisan political interests are excluded from the operations of the system.

- Linkages to other Sectors.

The tertiary education system relies on the secondary education system for its students. It is therefore important that attention is paid to students' preparation at that level. A quality system of tertiary education will also increase students' aspiration at the primary and secondary levels leading to higher standards as students compete for tertiary education places. There should also be an effective collaboration between higher education institutions and industry to ensure that graduates have skills that are consistent with the requirements of industry.

- Supportive Legal and Regulatory Structure

The legal environment and regulatory structure should be one that encourages innovation and achievement while discouraging corruption, mismanagement and duplication of effort.

- System-Wide Resources

It is highly advantageous and cost effective when tools for improving tertiary education are developed centrally and shared widely. These tools include management information systems, standardised tests and curriculum. It is also important that tertiary education institutions incorporate advances in information technology into their administrative structures, teaching and research. When the Internet is used as a means of gathering knowledge, it connects students and researchers to the worldwide community of scholars thereby overcoming intellectual isolation.

2.8 The Role of the State in Quality Assurance

In order to ensure an effective tertiary education system the state has to exercise an active oversight responsibility. The state, as the custodian of the public interest, has to play an active role in order to ensure equity and access to tertiary education and support research in areas that are relevant to the country's development needs. The

exact role of government in higher education ranges from extreme state control to total laissez-faire (World Bank, 2000). Under the total state control system the government owns, finances and operates tertiary education institutions. It therefore sees it as its exclusive preserve, the appointment of heads of institutions and the contents of the curricula. The rationale is that governments are entitled to control systems that they fund. This has been the practice in most developing countries in the postcolonial period. However, the direct involvement of politicians has tended to compromise the major principles of good governance of the system. It is for this reason that many countries decided to adopt alternative models in which the state plays only a supervisory role. This allows for the protection of the public interest while at the same time guaranteeing academic freedom and institutional autonomy. This balance can be achieved through the appointment of government representatives and the inclusion of other stakeholders (such as the private sector and students representatives) on statutory bodies. These statutory bodies include the following:

- Governing councils of tertiary education that advise the government on the size, shape and funding of higher education. These are also responsible for quality assurance and accreditation.
- Research councils and agencies that fund and promote research.
- Professional councils that focus on specific areas of tertiary education.

In order for these bodies to function effectively, their mandates and operating procedures must be clearly defined. In addition, they must be granted full autonomy by the government and have full control over the resources that are allocated to the institutions.

2.9 Tertiary Education Financing

In most developing countries, the full cost of provision of tertiary education is borne by the state. This over-reliance on the state implies that funding levels fluctuate with the ups and downs of government resources. It also means that improving the quality of the system requires a higher and more sustainable funding from the government. However, there is a range of possibilities for funding arrangements. Financing can be entirely public, private or a combination of the two (World Bank, 2000). Table 2.3 indicates the range of possibilities.

Table 2.2 Tertiary Education Financing

PROVISION / FINANCING	PUBLIC	PRIVATE
PUBLIC	I. Free public universities and other institutions of higher education relying on public funds to cover operating and capital expenditures.	II. Voucher systems under which the government pays a preset amount to the private schools students attend.
PRIVATE	III. Tuition, fees and income from foundation grants, industry contracts, and privately generated endowment cover full costs.	

Source: World Bank (2000): Higher Education in Developing Countries, p. 56.

Cell I, depicts the system of public financing and provision of tertiary education. This is the traditional paradigm for most developing countries.

Cell II depicts a situation in which there is private provision coupled with public financing. This system is very attractive because it can lead to the delivery of better education at the same overall public cost. In the voucher system the government awards funding to students who are free to enrol in different institutions or gives the money to the institution after the student enrols. This system gives the institutions a powerful incentive to provide quality education of a reasonable cost.

Cell III indicates a system of private financing within the context of either public or private provision. Private financing is attractive because it reduces the burden on government budgets and helps ensure that the costs of higher education are borne by the direct beneficiaries, who are the students. However private financing may discriminate against the enrolment of deserving but needy students who do not have the ability to pay.

In order to ensure quality, access and efficiency developing countries need to devise systems that can access financing from a combination of public and private sources.

2.10 Governance

The first official appearance of the concept of 'good governance' in development literature came in the 1989 World Bank report on Africa. The Bank had argued that a fundamental cause of Africa's development problems is the lack of good governance (World Bank, 1989). The Bank has since then been including 'good governance' as part of the criteria for its development assistance lending.

Good governance is synonymous with sound development management. When it is used in the context of tertiary education, it refers to the formal and informal arrangements within which institutions make decisions and take action. It is very important that the rules that determine the rights and responsibilities of the various stakeholders as well as their interactions are made official and explicit. Good governance is a necessary condition for achieving quality in tertiary education as it sets the parameters for institutional management.

The World Bank (2000) identifies eight major principles of good governance in the management of tertiary institutions. These are as follows:

- Academic Freedom

Academic freedom refers to the right of scholars to pursue their research, to teach, and to publish without control or restraint from the institutions that employ them.

- Shared Governance

The purpose of shared governance is to ensure that decisions are devolved to those who are best qualified to make them. It entails involving institutions in the formulation of policy at the national level and giving a role in decision making to staff at the institutional level. Students' representatives may also be involved at the institutional level.

- Clear Rights and Responsibilities

At the system level, the roles of the sector ministry and institutions need to be clearly defined by law and in national policy documents. Within the institutions the various stakeholders should have a clear understanding of their rights and responsibilities.

- Meritocratic Selection

This means that the selection and promotion of all categories of staff and students are based on well-defined merit. These decisions must be made within the institutions based on appropriate standards.

- Financial Stability

Financial stability is a basic precondition for proper academic planning and orderly development of institutions. When institutions face financial uncertainty and budgetary fluctuations good governance suffers. However institutions need to be insulated against undue influences from the major sponsors.

- Accountability

Institutions need to be accountable to their sponsors in a transparent manner. This can be achieved within the context of governing council meetings where all the major stakeholders including the sponsors are represented.

- Regular Testing of Standards

There should be mechanisms put in place to ensure the regular testing and verifications of standards of quality. The standards need to be widely agreed upon.

- Close Co-operation

Effective governance requires close co-operation and compatibility between different levels of institutional administration. This means that for significant appointments deans and heads of departments should have a formal role in the selection process.

2.11 Analytical Framework

This study is basically about the assessment of the quality of the teaching and learning environment in the Polytechnics. However 'quality' is a difficult concept to pin down. According to the Commonwealth Secretariat (1991), the definition of 'quality' in tertiary education depends on the perspectives of the different stakeholders: students, lecturers, employers, the government, and so on. It is also multidimensional depending on the range of purposes attributed to the teaching and learning environments and its outcomes by the different stakeholders. It is therefore very important that the concept of quality be operationalised by devising certain indicators

and designing measures for those indicators. These performance indicators, according to Cave *et al* (1996), are "*statements usually quantified, of resources employed and achievements secured in areas relevant to the particular objectives of the enterprise" (p. 22).*

The general rule of performance indicators is that when the indicator shows a difference in one direction this means that the situation is better, whereas, if it shows a difference in the opposite direction, then this means that the situation is less favourable.

The analytical framework for the study centres on the performance indicators relating to the inputs, processes and outputs of the polytechnics system. Fig 2.1 illustrates this framework. It views polytechnic education as a process of transforming inputs into outputs. The figure identifies three points at which indicators can be measured.
These are:

a) Inputs

The identified inputs in the polytechnics are the physical, human and financial resources and the students. Indicators for the physical resources include classrooms/lecture theatres, workshops/laboratories/studios and library. Those for human resources include teaching and teaching support staff. Financial resources indicators identify the sources of funding and educational expenditures. For the students the indicators are the total enrolment and its composition by type of programme.

b) Processes

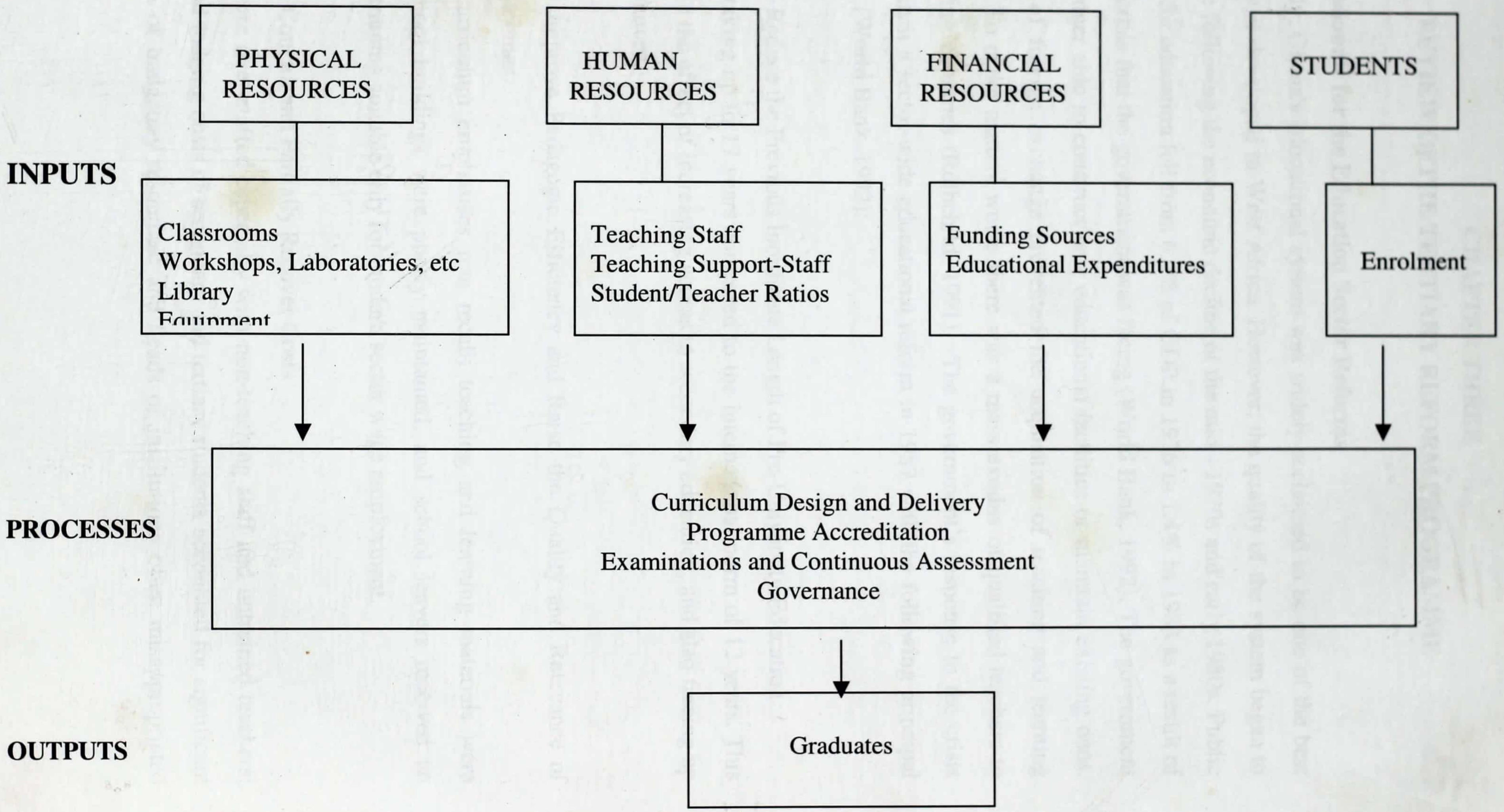
The processes are the interactions that take place between the students and the learning environment. Indicators for these include curriculum design and delivery, programme accreditation examinations and governance of the institutions.

c) Outputs

The major indicator of outputs from the education system is the quality of graduates. Data obtained from the research on these performance indicators are compared to the norms that have been developed by the National Council for Tertiary Education

(NCTE) and conclusions drawn. In cases where norms do not exist an attempt is made to assess the level of the indicator at which quality can be assured.

Fig. 2.1 ANALYTICAL FRAMEWORK



CHAPTER THREE

REVIEW OFTHE TERTIARY REFORM PROGRAMME

3.1 Rationale for the Education Sector Reforms

Historically, Ghana's educational system was widely acclaimed to be one of the best and the most developed in West Africa. However, the quality of the system began to deteriorate following the economic decline of the mid - 1970s and early 1980s. Public resources for education fell from 6.4% of GDP in 1976 to 1.4% in 1983 as a result of the fiscal crisis that the government was facing (World Bank, 1992). The government was no longer able to construct new educational facilities or maintain existing ones. The lack of foreign exchange prevented the acquisition of teaching and learning materials. To make matters worse there was a mass exodus of qualified teachers to neighbouring countries (Rothchild, 1991). The government's response to the crisis was to launch a sector-wide educational reform in 1987 with the following principal objectives (World Bank, 1992):

i. To Reduce the Previous Inordinate Length of Pre-University Education

This was taking up to 17 years compared to the international norm of 12 years. This would have the effect of increasing access to secondary education, and also freeing up public resources.

ii. To Improve Pedagogic Efficiency and Raise the Quality and Relevance of Outcomes

The old curriculum emphasises rote recall; teaching and learning materials were scarce; school buildings were poorly maintained; and school leavers received an academic training suitable only for modern sector wage employment.

iii. To Contain and Partially Recover Costs

Schools were over-staffed especially with non-teaching staff and untrained teachers; feeding and lodging costs of secondary and tertiary students accounted for significant proportion of budgetary resources; and heads of institutions often misappropriated funds.

iv. To Enhance Sector Management and Budgetary Procedures

Physical and financial norms did not exist; planning and budgeting were separated; and monitoring was inadequate, especially at the institutional level.

As a result of the sector-wide reforms, the structure of the educational system was changed to 6:3:3:4, that is, 6 years of primary, 3 years of junior secondary school (JSS), 3 years of senior secondary school (SSS) and 4 years of tertiary education. The reform programme was divided into phases, namely, basic (primary and JSS) from 1987 to 1990, SSS from 1991 to 1993 and tertiary from 1992.

Significant achievements made under the basic and SSS stages include the following:

- Enrolment levels have increased at all levels of education after a long period of stagnation.
- The curriculum has been reformed at both primary and secondary levels to be less theoretical and more relevant to the country's development needs. There has also been an improvement in the level of resourcing.
- Costs have been contained in several ways including rationalisation of staff. Cost recovery measures have also been introduced.
- Sector management, planning and budgeting have been improved by a merger of staff into a unified planning, programming, budgeting, monitoring and evaluation division of the Ministry of Education. The Ministry has also introduced new physical and financial norms.

3.2 The University Rationalisation Committee (URC) Report

The University Rationalisation Committee (URC) was set up in 1986 to undertake a reappraisal of the problems facing the tertiary education sub-sector and make recommendations for improvement. The basis for the work of the URC stems from the anxiety of the government regarding the inadequacies in the existing educational system and, therefore, the urgency for its review and overall structural reform (URC, 1987). The work of the URC therefore focused on the *modus operandi* of restructuring Ghana's tertiary education system. Of special concern was the need to:

- Correct the negative consequences of a steady decline in the quality of education due to inefficient management and scarcity of educational materials and qualified personnel, and
- Reorient the structure and content of education based on a careful assessment of the development needs of the country.

The URC produced two reports: an *Interim Report* in 1987 and a *Final Report* in 1988. These two reports contain a comprehensive and detailed summary of the problems then confronting tertiary education in Ghana, and a number of recommendations involving articulation and reorientation of policy. These recommendations were later formalised in the "*White Paper on the Reforms to the Tertiary Education System, 1991*".

3.3 Policy Objectives of the Reform Programme

The overall aim of the tertiary education reform was to establish an integrated tertiary education system made up of all post-secondary training institutions. To this end, the "*White Paper on Reforms to the Tertiary Education System, 1991*" has guided tertiary education policy since 1992. The principal objectives of the reform were:

- The restructuring, consolidation, and upgrading of tertiary institutions;
- Curriculum revision with the goal of increased relevance;
- Expansion of the system to increase access and equity;
- Diversification of funding sources; and
- Improved management.

The major components of the programme as stated in the *White Paper* include the following:

a) Integration of the tertiary education system

The proposal was to create a unified system comprising all tertiary institutions, including those controlled by other ministries and place them under the control of the Ministry of Education (MOE). This will ensure effective planning for all institutions on the basis of common criteria and financing according to common principles.

b) Restructuring the System

The purpose of the restructuring was basically to improve cost effectiveness and upgrade the quality of teaching. The government proposed to establish four regulatory bodies to co-ordinate and provide policy oversight. These bodies are:

i. National Board for Tertiary Education (NCTE),
ii. Joint Admissions and Matriculation Board (JAMB),
iii. Nation Accreditation Board (NAB), and
iv. National Board for Professional and Technician Examinations (NABPTEX)

Under the restructuring programme, the polytechnics were to be upgraded from second cycle institutions to tertiary level and their course offerings restructured to reflect their new status. Other structural changes include the establishment of UCEW to group the diploma - awarding institutions and the establishment of Regional Colleges of Applied Arts, Science and Technology (RECAAST), which groups the post-secondary Teacher Training Colleges and other sector specific training institutions such as the Nurses Training Colleges.

c) Rehabilitation of Facilities

This component included the rehabilitation of buildings as well as infrastructural systems such as water, power and telephones. All abandoned projects were to be completed. The programme also envisaged the construction of facilities for non-resident students and the re-equipment of workshops and laboratories. This expansion in facilities would enable more students to be enrolled.

d) Quality Improvement and Relevance

Several proposals were made to address the need for quality improvement. Among these were proposals for new and upgraded courses with content more relevant to Ghana's development needs, staff development, increased availability of instructional materials, and the devotion of a higher proportion of available financial resources to academic purposes.

In the polytechnics, courses were to be offered at the Higher National Diploma level. All *Advanced Craft* courses were to be transferred to second cycle institutions. The

main focus of staff development was to bring all staff capable of such studies to first-degree level. However, the minimum requirement for new lecturers would be a second degree. The government also recognised the fact that instructional materials have a considerable influence on the quality of students' learning experiences. It was for this reason that proposals were made to increase the availability of textbooks, core, journals and reference books in the polytechnic libraries.

In order to strengthen academic standards, the government has developed norms for the allocation of institutional budgets among the competing uses. It is envisaged that over time as much as 70% of the budget would be spent on teaching, libraries and research (NCTE, 1999).

e) Increase in Enrolment

The rationale for wishing to increase tertiary enrolment included the following:

- To meet the increased requirements of educational manpower to lead the economy to sustainable and accelerated growth,
- To expand access to tertiary education to include a wider social range of capable students, and
- To accommodate the large increase in the demand for tertiary education when large numbers of students from the new senior secondary schools graduate.

However, in view of the crucial importance of enrolment numbers for both the quality of education provided and its budgetary costs, government decided that overall polytechnics enrolments should not exceed the targets set in Table 3.1 (World Bank,1992). Full time students were to constitute 8,000 and part time students 6,000 of the 1997/98 enrolments.

Table 3.1 Enrolment Targets in Polytechnics

YEAR	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/ 2000
Enrolment	10,500	11,000	11,500	12,000	13,000	14,000	15,000	16,000

Source. World Bank (1992) Staff Appraisal Report: Republic of Ghana, Tertiary Education Project, p.89

f) Management Efficiency

The polytechnics were expected to set up planning units to develop the management information systems needed for institutional and sectoral management. In addition planning norms were to be developed to ensure efficiency in institutional management. The polytechnics were required to conform to these administrative, financial and staffing norms, which would be laid down from time to time by the Ministry of Education. These norms represent quantified objectives that are to assist the planning units in their function of ensuring efficiency.

g) Financing, Fees and Cost Sharing.

The Government White Paper on the tertiary education reforms states that a system of cost sharing between the government, the student population and the private sector would be developed.

The *government's* contribution would cover:

a. Provision of recurrent subventions, equipment and capital grants,
b. Specified grants for students and teaching staff,
c. Provision of scholarships,
d. Assistance to students to obtain loans to defray maintenance and other expenses, and
e. Retention of free tuition.

It was made explicit in the *White Paper* that *students* would take full responsibility for the cost of their maintenance and other incidental expenses. The *private sector* would be encouraged to provide scholarships to students, work-study arrangements and other assistance to tertiary institutions.

3.4 The Tertiary Education Project

In 1993, the Government launched the Tertiary Education Project (TEP) to assist in the implementation of the first phase of the tertiary reform programme with an IDA assistance of SDR 31.2 million (US$45.0 million) (World Bank, 1992). Total project cost was $51.4 million with the Government of Ghana providing counterpart funding of $6.4 million. At the same time, the Government also received a credit amount of $15 million from the African Development Bank (ADB) to finance other tertiary education expenditures. The major project objectives were:

- Quality improvement in teaching and learning.
- Improved management
- Increased autonomy and accountability, particularly in the polytechnics, and
- A gradual increase in enrolment.

The TEP had two components:

a) A *central* component for MOE and the proposed new boards for accreditation, admissions and examinations, consisting of:

i. Office equipment, computers and vehicles,
ii. Staff development,
iii. Technical assistance, and
iv. Assistance in project management

b) An *institutional* component for each of the three established universities, the proposed UCEW and the six existing polytechnics consisting of:

i. Civil works, involving rehabilitation and selected new academic facilities, and facilities for non-resident students,
ii. Laboratory and workshop equipment supply and equipment maintenance,
iii. Core Textbooks, library journals and reference books,
iv. Computers,
v. Vehicles,
vi. Staff Development,
vii. Research funding (at the universities), and
viii. Management and technical assistance.

The new University for Development Studies at Tamale and the two proposed polytechnics at Koforidua and Sunyani were specifically excluded, as they were held by the Bank to be unsustainable (Girdwood, 1999).

3.5 Tertiary Education System In Ghana

Currently, public tertiary teaching institutions in Ghana comprise ten polytechnics, five universities, and two professional institutes (NCTE, 1999).

a) Polytechnics

As part of the tertiary education reform programme, the Polytechnics at Accra, Cape Coast, Ho, Kumasi, Takoradi and Tamale, which were formerly operating as second cycle institutions under the Ghana Education Service (GES), were upgraded in 1992 to tertiary status. In 1996, two Technical Institutes at Koforidua and Sunyani were also upgraded to tertiary status as polytechnics. This year, 2000, the Bolgatanga and Wa Technical Institutes have also been granted tertiary status as polytechnics. What this means is that each of the ten regions in the country now has a polytechnic.

b) Universities

There are four fully-fledged universities. These are the University of Ghana (UG), the Kwame Nkrumah University of Science and Technology (KNUST), the University of Cape Coast (UCC) and the University for Development Studies (UDS). In addition to these, a number of Diploma awarding training institutions were amalgamated into the University College of Education of Winneba (UCEW), which is currently affiliated to UCC.

c) Professional Institutes

The professional institutes are the Institute of Professional Studies, which offers courses in Accountancy, Administration and Business, and the Ghana Institute of Languages, which offers courses in foreign languages as well as Bilingual Secretaryship and Translation.

A number of private institutions have also recently been approved by the Government to offer tertiary education.

In addition to the teaching institutions three of the regulatory bodies have been established. These are NCTE, NAB and NABPTEX. Their functions are discussed in Section 3.6.

3.6 Quality Assurance Agencies

Three of the boards listed in Section 3.4 as external quality assurance agencies for the polytechnics have so far been established. These are discussed below:

3.6.1 National Council for Tertiary Education

The National Council for Tertiary Education (NCTE) was established under Act 454 in 1993 to exercise an oversight responsibility for all tertiary education institutions in the country. Its functions include the following:

a) To advise the Minister of Education on the development of tertiary education institutions in Ghana.

b) To enquire into the financial needs of the institutions and advice the Minister.

c) To recommend to the Minister for purposes of the preparation of the annual national education budget:

   (i) Block allocation of funds towards running costs; and

   (ii) Grants towards capital expenditure of each institution indicating how the allocations are to be disbursed.

d) To recommend national standards and norms on staff, costs, accommodation and time utilisation for approval of the Minister and to monitor the implementation of the approved standards and norms.

In the performance of its statutory responsibilities, the NCTE has developed the following norms on staff, students' enrolment and recurrent expenditure for the polytechnics (NCTE, 1999):

- **Student/Teacher Ratios**

Engineering	1: 12
Applied Science	1: 15
Management and Business	1: 20

- **Teaching Staff Mix**

Principal/Senior Lecturers	20%
Lecturers/Principal Instructors	50%
Senior Instructors/Instructors	30%

- **Teaching Support Staff/Teacher Ratios**

	Science	Management and Business
Administrative	1: 10	1: 10
Senior Technical	1: 5	1: 10
Junior Technical	1: 3	1: 5
Junior Non-Technical	1: 10	1: 10

- **Student Enrolment Norms**

Science	60%
Management and Business	40%

- **Recurrent Expenditure**

Direct Academic Costs	55%
General Education Expenses	5%
Library Costs	10%
Central Administration Expenses	6%
Students & Staff Facilities Expenses	10%
Municipal Services	10%
Miscellaneous Expenses	4%

3.6.2 National Accreditation Board

The National Accreditation Board (NAB) was established under PNDC Law 317 of 1993. Its main function is to ensure that tertiary educational institutions have the physical, material, financial and human resources necessary for the delivery of quality education. Section 3 of the NAB Law states that:

> 3 (i) *"The Board shall be responsible for the accreditation of public and private institutions with regards to the contents and standards of the programmes".*
>
> 3 (ii) *"Determine in consultation with the appropriate institution or body, the programme and requirements for the proper operation of that institution and the maintenance of acceptable levels of academic or professional standards".*

The Board has developed a set of criteria in relation to institutions and programmes which it evaluates in its accreditation process. These criteria relate to:

- Academic Matters including curriculum, admission requirements and examinations.
- Staffing including teaching staff numbers and qualification, student/teacher ratios and staff development.
- Physical Facilities including classrooms, laboratories/workshops/studios and equipment.
- Library Facilities including textbooks, and journals, sitting capacity and reprographic equipment.
- Funding including sources of funding, and recurrent and development budgets.

The Board grants three types of accreditation based on the recommendation of Panels of Assessors, which it sets up for a purpose (NAB, 1999). These are:

- Institutional Accreditation, which is granted to establishments to run tertiary educational institutions.
- Programme Accreditation, which is granted to specific programmes that each accredited institution has the capacity to offer at an acceptable standard. This type of accreditation could be Interim (for less than 5 years) or Full (for 5 years).
- Interim Letter of Authority, which enables proprietors wishing to establish tertiary institutions to put together the necessary physical, material, financial and human resources. This does not permit the institution so established to admit students unless it satisfies the requirements for both institutional and programme accreditation.

3.6.3 National Board For Professional And Technician Examinations

The National Board for Professional Technician Examinations (NABPTEX) was established under Act 492 of 1994. The major function of the Board is to ensure that the appropriate standards are maintained. According to Section 2(1) of Act 492:

> "*The object of the Board is to formulate and administer schemes of examinations, evaluation, assessment, certification and standards for*

(a) skill competence; and

(b) syllabus competence

for non-university tertiary institutions, professional bodies and private institutions with accreditation by the National Accreditation Board Law, 1993 (PNDC Law 317)".

In the performance of this function NABPTEX awards the certificates of polytechnic graduates based on the examinations conducted by the polytechnics. The Board also plays a very important role in the appointment of external examiners and moderators and also in the classification of certificates. It is also involved in the review of the curricula of the various programmes run in the polytechnics.

CHAPTER FOUR

DATA ANALYSIS: THE CURRENT SITUATION IN THE POLYTECHNICS

4.1 Enrolment

The polytechnics admit three categories of students into their tertiary programmes. These are graduates from the Senior Secondary Schools (SSS), those with the GCE 'A' Level and Mature candidates. All the institutions follow strict admission requirements.

SSS Applicants: SSS applicants seeking admission into Higher National Diploma (HND) programmes must have at least five passes at the Senior Secondary School Certificate Examinations (SSSCE) including Core English and Core Mathematics.

GCE A Level Applicants: The applicant must have five credit passes at the GCE 'O' Level including English Language and Mathematics. In addition they must have passed three relevant GCE 'A' Level subjects plus the General Paper.

Mature Applicants: Applicants must have at least five years relevant working experience. They must be at least 30 years old and have credit passes in five GCE 'O' Level subjects including English and Mathematics. In addition, they must pass an entrance interview.

The study revealed that Accra Polytechnic has the highest enrolment followed by Kumasi, Sunyani, Ho and Koforidua in that order. However, as can be seen from Table 4.1, Kumasi enrolled the highest number of tertiary students, with a population of 2771. The least numbers of tertiary students enrolment can be found in Sunyani and Koforidua. This is not surprising because these two institutions are quite new relative to the older ones of Kumasi, Accra and Ho.

Table 4.1 Enrolments 1998/99

Institution	Engineering			Business & Management			Applied Science			All Programmes		
	Tert.	Non Tert.	Total	Tert.	Non Tert.	Total	Tert.	Non Tert.	Total	Tert.	Non Tert.	Total
Accra	986	370	1356	439	194	633	1325	404	1729	2750	968	3718
Ho	602	128	730	315	111	426	665	389	1054	1582	628	2210
Koforidua	0	0	0	166	0	166	916	256	1172	1082	256	1338
Kumasi	1013	18	1031	547	331	878	1211	481	1692	2771	830	3601
Sunyani	251	840	1091	95	610	797	875	504	1379	1221	1954	3175

Source: Author's Field Survey, 2000

Since the inception of the tertiary education reforms, there has been a consistent increase in tertiary students enrolment in all the institutions except for Accra, where there was a decrease in 1998/1999 over the 1997/98 figure.

The rate of growth of enrolment in all the polytechnics far exceeds the NCTE's recommended rate of 15 percent per annum. Table 4.2 indicates that the growth rate of tertiary students enrolment in the older institutions was highest in Kumasi, which recorded a growth rate of 39 percent per annum from the 1993/94 academic year to 1998/99. This is followed by Ho, 38 percent and Accra, 28 percent. In the newer institutions, Koforidua grew at the rate of 176 percent per annum from 1996/97 to 1998/99 followed by Sunyani 161 percent over the same period.

Table 4.2 Growth of Tertiary Enrolment

Institution	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	Growth Rate (%)
Accra	644	1218	2157	2422	2858	2750	28
Ho	237	237	748	1184	1482	1582	38
Koforidua	-	-	-	50	308	1082	176
Kumasi	407	1323	1719	1870	2153	2771	39
Sunyani	-	-	-	67	366	1221	161

Source: Data for 1993/94 to 1997/98 obtained from the NCTE. 1998/99 data obtained from survey.

Under the tertiary education reforms the polytechnics were expected to phase out all non-tertiary courses. An analysis of the enrolment data shows that all the polytechnics are far from achieving a 100 percent tertiary students enrolment. As indicated in Table 4.3, only 67 percent of polytechnic students in the country enrol in tertiary programmes. There are wide variations in the individual institutions with Koforidua achieving 81 percent and Sunyani only 38 percent.

The distribution of tertiary students into science-based and arts-based programme shows that the polytechnics admit fewer science students than arts students. The science-based programmes are those offered in Engineering and the Applied Sciences while the arts-based programmes are those in Business and Management Studies. It can be seen from Table 4.4 that the older polytechnics are much closer to achieving the target ratio of 60:40 for science/art programmes. Ho has a ratio of 58:42 followed by Kumasi 56:44 and Accra 52:48. In the newer polytechnics, Koforidua has a ratio of 15:85 and Sunyani 28:72.

Table 4.3 Tertiary Share of Total Enrolment, 1998/99

INSTITUTION	TERTIARY ENROLMENT (%)
Accra	74
Ho	72
Koforidua	81
Kumasi	77
Sunyani	38
All Polytechnics	67

Source: Author's Field Survey, 2000

Table 4.4 Distribution of Tertiary Students Enrolment 1998/99

INSTITUTION	SCIENCE		ARTS		TOTAL
	NO.	%	NO.	%	NO.
Accra	1425	52	1325	48	2750
Ho	917	58	665	42	1582
Koforidua	166	15	916	85	1082
Kumasi	1560	56	1211	44	2771
Sunyani	346	28	875	72	1221
TOTAL	4414	47	4992	53	9406

Source: Author's Field Survey, 2000

4.2 Teaching Staff

The key indicators determining the quality of teaching are staff numbers, mix and qualifications and student/teacher ratios.

4.2.1 Teaching Staff Numbers, Mix and Qualifications

Teaching staff in the polytechnic are appointed into seven different categories depending on their qualifications and experience. These categories are Principal Lecturer, Senior Lecturer, Lecturer, Principal Instructor, Senior Instructor, Instructor and Assistant Instructor. Applicants with post-graduate degrees or equivalent are appointed into the Lectureship grades while those with first degrees, HND or their equivalent are appointed into the Instructorship grades starting from Instructor. Those with qualifications below first degree or HND start as Assistant Instructors.

Table 4.5 indicates that the calibre of teaching staff in the polytechnic is quite low. Very few staff are in the Principal and Senior Lecturer grades at Ho, Koforidua and Sunyani, while Accra and Sunyani do not have any staff of these ranks. The figures for the other polytechnics range from 1.4 percent for Ho to 5.4 percent for Koforidua.

The proportion of staff within the Lecturer and Principal instructor grades range from 29.5 percent for Sunyani to 75.8 percent for Kumasi. The distribution also shows that the bottom ranks, that is, from Senior Instructor down to Assistant Instructor, are very heavy. Except for Kumasi, which has 20.9 percent, all the institutions have close to 50 percent or more in these grades.

Table 4.5 Academic Staff Mix

INSTITUTION	DISCIPLINE	PRIN / SNR LECTURER		LECTURER/PRIN. INSTRUCTOR		SNR. INST./INST./ ASST INST.		TOTAL
		No.	% Share	No.	% Share	No.	% Share	
Accra	Engineering	0	0	20	52.6	18	47.4	38
	Appld Sci.	0	0	17	45.9	20	54.1	37
	Bus. /Mgt.	0	0	11	55.0	9	45.0	20
	Sub-Total	0	0	48	50.5	47	49.5	95
Ho	Engineering	0	0	10	33.3	20	66.7	30
	Appld Sci.	0	0	6	28.6	15	71.4	21
	Bus. /Mgt.	1	5.3	7	36.8	11	57.9	19
	Sub-Total	1	1.4	23	32.9	46	65.7	70
Koforidua	Engineering	0	0	0	0	0	0	0
	Appld Sci.	0	0	2	33.3	4	66.7	6
	Bus. /Mgt.	2	6.5	11	35.5	18	58.0	31
	Sub-Total	2	5.4	13	35.1	22	59.5	37
Kumasi	Engineering	1	2.3	37	86.1	5	11.6	43
	Appld Sci.	2	6.2	19	59.4	11	34.4	32
	Bus. /Mgt.	0	0	13	81.2	3	18.8	16
	Sub-Total	3	3.3	69	75.8	19	20.9	91
Sunyani	Engineering	0	0	2	9.1	20	90.9	22
	Appld Sci.	0	0	5	55.5	4	44.4	9
	Bus. /Mgt.	0	0	6	46.2	7	53.8	13
	Sub-Total	0	0	13	29.5	31	70.5	44
NORM			20		50		30	100

Source: Author's Field Survey, 2000

This distribution pattern can be attributed to a number of factors. Firstly, all the institutions started as Technical Institutes and upon upgrading to tertiary status inherited all the staff including those with lower qualifications. Secondly, promotion or appointments into the higher grades of Principal and Senior Lecturer is contingent upon evidence of research publications. Since most of the staff have not undertaken any research, upwards mobility has been extremely difficult. The few staff that are currently in these higher grades are those either on sabbatical leave from the universities or are on contract following their retirement from the universities.

4.2.2 Student/Teacher Ratios

The ratio of students to teachers (STR) is a popular indicator of staff utilisation. The STR is used to determine the number of teachers required by a department. The norms developed by the NCTE are also to ensure cost effectiveness and efficiency in the running of the polytechnics. In computing the actual STR for the institutions, only the academic staff teaching in the three discipline areas of Engineering, Applied Science, and Business/Management Studies were considered. Those teaching English and Liberal Studies were ignored because these subjects do not form part of the main tertiary programmes but are studied by all students as servicing subjects. This is also the convention adopted by the NCTE.

Table 4.6 Student-Teacher Ratios

INSTITUTION	ENROLMENT	NO. OF STAFF	STUDENT/ TEACHER RATIO	NORM
ACCRA				
Engineering	986	38	1:26	1:12
Applied Science	439	37	1:12	1:15
Business/Management	1325	20	1:66	1:20
Sub-Total	2750	95	1:30	
HO				
Engineering	602	30	1:20	1:12
Applied Science	315	21	1:15	1:15
Business/Management	665	19	1:35	1:20
Sub-Total	1582	70	1:23	
KOFORIDUA				
Engineering	0	0	-	1:12
Applied Science	166	6	1:28	1:15
Business/Management	916	31	1:30	1:20
Sub-Total	1082	37	1:29	
KUMASI				
Engineering	1013	32	1:32	1:12
Applied Science	547	16	1:34	1:15
Business/Management	1211	43	1:38	1:20
Sub-Total	2771	91	1:31	
SUNYANI				
Engineering	251	22	1:11	1:12
Applied Science	95	9	1:11	1:15
Business/Management	875	13	1:67	1:20
Sub-Total	1221	44	1:28	
ALL POLYTECHNICS				
Engineering	2852	122	1:23	1:12
Applied Science	1562	89	1:18	1:15
Business/Management	5002	126	1:40	1:20
TOTAL	9416	337	1:23	

Source: Author's Field Survey, 2000

As can be seen from Table 4.6, STRs are very high for all the polytechnics taken together. The ratio for Engineering programmes is 1:23, Applied Science 1:18 and Business/Management Studies 1:40. Within the individual institutions, Sunyani operates within the norms with respect to Applied Sciences and Engineering while Accra complies with the norms in respect of Engineering only. In all the institutions the ratio for Business/Management studies is extremely high. This ranges from 1:38 for Kumasi to 1:67 for Sunyani. These ratios also indicate the level of understaffing in the institutions. The higher the ratio, the higher the level of understaffing. It can therefore be concluded that in almost all departments in all the institutions there is a high level of understaffing.

4.3 Physical Resources

Physical resources constitute a very important input in the educational system. These inputs can be classified into classrooms; workshops, laboratories and studios; library; equipment including computers; textbooks and journals and consumables.

4.3.1 Physical Infrastructure

Table 4.7 indicates the number of the various types of physical infrastructure in each polytechnic.

Table 4.7 Physical Facilities

INSTITUTION	CLASSROOMS	WORKSHOPS	TOTAL
Accra	22	9	31
Ho	13	6	19
Koforidua	6	1	7
Kumasi	37	25	62
Sunyani	8	1	9

Source: Author's Field Survey, 2000

It can be seen from Table 4.7 that Kumasi is better endowed in terms of both classrooms and workshops. It has thirty-seven classrooms and twenty-five workshops. This is followed by Accra with twenty-two classrooms and nine workshops. The least endowed is Koforidua with six classrooms and only one workshop.

Students were asked to assess the adequacy of both classroom and workshop space and their responses are presented in Table 4.8.

Table 4.8. Adequacy of Physical Facilities

INSTITUTION	CLASSROOMS		WORKSHOPS		LIBRARY	
	Adequate	Inadequate	Adequate	Inadequate	Adequate	Inadequate
Accra	75	25	35	65	10	90
Ho	100	0	0	100	50	50
Koforidua	-	-	-	-	-	-
Kumasi	83	17	33	67	5	95
Sunyani	80	20	25	75	40	60

Source: Author's Field Survey, 2000

More than 75 percent of the students in each polytechnic responded that there are enough classrooms. On the other hand, more than 65 percent say that they are short of space in the workshops, laboratories and studios. It is for this reason that they are compelled to go to the Kwame Nkrumah University of Science and Technology in Kumasi for their workshop and laboratory practicals in order to satisfy the requirements of the National Board for Professional and Technician Examinations.

All the institutions have their libraries housed at temporary sites. In the case of Accra, Ho, and Kumasi the authorities are making use of their Non-Residential Students Facilities while at Koforidua and Sunyani the libraries are located in classrooms. It is important to note that in all the institutions, all the students interviewed responded that the sitting capacity of the libraries are very much limited. When asked to assess the adequacy of reference materials, 63 percent of the students in all the institutions replied that though the material are current they are inadequate in terms of numbers. The others, that is, 37 percent indicated that the materials are both out-of-date and not enough. All the institutions have only one photocopier each in the library for the use for both students and staff. Considering the students' population on each campus this is clearly inadequate.

4.3.2 Equipment

All the older polytechnics benefited from the supply of workshop equipment under the Tertiary Education Project. Koforidua and Sunyani did not benefit because they had not been established as at the start of the project. The polytechnics have hitherto

been operating with obsolete workshop equipment. A number of vehicles and computers were also supplied to the polytechnics. However, an inspection of the computer laboratories revealed that most of the original computers have broken down.

In departments where students undertake practical work, majority were of the opinion that though the available equipment were of good quality these were inadequate considering the number of students and the range of tasks that they were required to perform.

Table 4.9 Quality of Workshop Equipment

CONDITION	Accra	Ho	Koforidua	Kumasi	Sunyani
Good Quality and Adequate	15%	10%	-	23%	0%
Good Quality but Inadequate	60%	75%	-	62%	30%
Poor Quality and Inadequate	25%	15%	-	23%	70%

Source: Author's Field Survey, 2000

4.4 Curriculum Design and Delivery

Curriculum relevance is one of the key concepts identified in the White Paper on the Tertiary Education Reform programme. The White Paper emphasised the need to establish links between the academic processes of institutions and national development. It was therefore stated that all tertiary institutions would be required to review periodically the curriculum of all programmes with a view to ensuring their continuing relevance to national needs.

Experts appointed by the Ministry of Education designed the original curricula for all the HND programmes. These experts came from both academia and industry. The appointment of experts from industry was to ensure that the curricula would meet the requirements of industry for middle-level manpower. All the institutions are currently using the curricula, which were designed in 1992. Although all the students interviewed on the various campuses felt that the original curricula are still relevant in terms of their objectives and content, NABPTEX has felt the need to review them. The review process took place in 1999. However the final documents are yet to be approved by the Ministry of Education and put to use by the institutions.

In terms of curriculum delivery all the polytechnics use just the traditional methods of lectures and seminars. The classroom experiences are combined with the workshop

and laboratory work, which enable the students to acquire practical skills. In addition, students also undertake supervised industrial visits and attachments.

In their assessment of the performance of lecturers all the students interviewed in the various polytechnics indicated that their lecturers were doing a good job.

4.5 Programme Accreditation

As stated in Section 3.6.2, NAB is the body charged with the responsibility of assessing the delivery of quality tertiary education. Institutions seeking accreditation for programmes have to respond to a set of questionnaire developed by the Board. Based on the submitted questionnaire, the accreditation sub-committee of the Board conducts a general inspection of the premises and facilities of the institution. Upon the receipt of a satisfactory report on the visit, the Board constitutes relevant panel of experts to assess the syllabuses, human resource availability and teaching and learning processes for each programme. The mode of certification is also ascertained. The Board then considers the reports of the various panels and makes recommendations to the Minister of Education regarding the accreditation status that should be granted the institution and its programmes.

As indicated in Table 4.10 the study revealed that Accra and Ho have achieved a 100 percent approval for all their programmes in the form of either full or interim accreditation. Two programmes at Kumasi, namely, Civil Engineering and Chemical Engineering, Statistics at Koforidua and Building Technology at Sunyani are yet to be accredited. For the unaccredited programmes at Kumasi, the institution has been ordered by NAB not to admit students until appropriate actions have been taken to rectify the shortcomings. Koforidua and Sunyani are still awaiting visits from the accreditation panel in respect of the programmes that have not been accredited.

Table 4.10. Accreditation Status of HND Programmes

INSTITUTION	ACCREDITED		NOT ACCREDITED		Total
	No.	%	No.	%	
Accra	13	100	0	0	13
Ho	10	100	0	0	10
Koforidua	3	75	1	25	4
Kumasi	16	89	2	11	18
Sunyani	4	80	1	20	5

Source: Author's Field Survey, 2000

4.6 Examinations and Continuous Assessment

The purpose of assessment is to enable students demonstrate that they have fulfilled the objectives of the programme of study and achieved the standard required for the qualification that they seek. NABPTEX has designed a set of regulations that govern the conduct of examinations and the award of certificates.

Continuous assessment in the form of class tests, assignments and mid-semester examinations constitute 30 percent of the semester's examinations. The final awards are classified according to the student's Cumulative Grade Point Average (CGPA). The study revealed that all the institutions follow these rules and regulations.

4.7 Governance and Management

In its Final Report, the URC identified the need to improve on the management practices and planning within tertiary institutions (URC, 1988). Girdwood (1999) has underscored this point in asserting that it is in planning and the use of resources that tertiary institutions have the greatest opportunity to improve their efficiency and effectiveness. A number of tools for achieving good governance and managerial efficiency can be identified in the polytechnics. These include the Polytechnic Council, the Academic Board, Planning Unit, Financial and Stores Regulations, and Student Handbook.

a) Polytechnic Council

The Polytechnic Council is the highest decision making body of the polytechnic. Its functions include the determination of the educational character and mission of the polytechnic and the consideration and approval of the polytechnic budget. Membership of the Council includes two representatives of Convocation, one of the Teachers and Education Workers Union (TEWU) and two from the Students Representative Council (SRC). The inclusion of these members ensures that the interest of both students and staff are taken care of in reaching decisions that affect them. It also ensures transparency and accountability in institutional management. The study revealed that all the institutions have properly constituted councils in accordance with the Polytechnic Law, 1992, PNCL 321.

b) Academic Board

The Academic Board consists of representatives from each of the three schools, that is, Engineering, Applied Science, and Business and Management Studies and all the academic departments. The Board is responsible for making selected academic policy decisions including the programmes that are offered, admissions policy, examinations and disciplinary matters relating to students. The study also revealed that all the institutions have their Academic Boards in place.

c) Planning Unit

An effective management decision-making requires the availability of adequate data including those relating to staff and student numbers, students' achievement and the financial status of the institution. It is the responsibility of the planning unit to ensure that adequate data exists for planning purposes. The unit is also required to monitor institutional performance in relation to the NCTE norms. The study shows that two of the institutions, that is, Ho and Koforidua, have not as yet established their Planning Units. The importance of the Unit was particularly apparent with the ease of data collection in the institutions where it exists and the difficulty experienced in the ones where it does not exist.

d) Financial and Stores Regulations

The operation and performance of financial management systems in any organisation depend on the development of transparent, logical and well–understood set of rules for budgeting and accounting procedures. To this end the NCTE has formulated the "*Financial and Stores Regulations*" for the Polytechnics. The need for this became apparent during the work of the URC when corruption and mismanagement of public funds were identified as very serious problems bedevilling the tertiary education system (URC, 1988). In the study, the Finance Officers in all the polytechnics indicated that they are guided in their work by the provisions of the Regulations.

e) Students Handbook

The students' handbook is also a very important tool for promoting good governance. The handbook defines the objectives, rules, and requirements of the different academic programmes as well as the responsibilities of students. With the exception

of Accra, all the institutions have published and distributed copies of the handbook to all their students.

4.8 Financial Resources

4.8.1 Sources of Funding

The Polytechnics are largely funded by grants from Government in the form of monthly subventions in respect of their recurrent expenditures. In addition the Government also funds capital developments under the Public Investment Programme (PIP). The Polytechnics began receiving government grants from the 1992/93 academic year when they were upgraded to tertiary status. The grants cover the personal emoluments of staff, the maintenance of physical infrastructure and the procurement of teaching and learning resources including equipment, textbooks, journals and consumables.

Table 4.11 presents the grants received by each polytechnic. Government expenditure per student is computed for the institutions where the financial data was provided. Ho received the highest amount of ¢ 1,692 million and Sunyani the least amount of ¢ 645 million. Under the Programme-Linked Budgeting System of the Polytechnics, students' enrolment was to be the basis for the determination of the quantum of Government's funding for tertiary institutions. Those with higher enrolments are expected to receive higher amounts and vice versa.

Table 4.11 Government Recurrent Expenditure Per Student

INSTITUTION	GOVERNMENT GRANT (¢)	EXPENDITURE PER STUDENT (¢)	
		TERTIARY	Non-Tertiary
Accra	NA		
Ho	1,692,000,000	944,724	314,908
Koforidua	NA		
Kumasi	1,179,000,000	387,192	129,064
Sunyani	645,000,000	345,551	115,184

Source: Author's Field Survey, 2000

By this formula, Kumasi should have received the highest amount as it enrolled more tertiary students in 1998/99 than all the other institutions. However, this is not the case. It can also be seen from Table 4.11 that there is a wide disparity in terms of government recurrent expenditure per student in the polytechnics. For example, the

amount of ¢ 944,724.00 received by Ho for each tertiary student is almost three times what Sunyani received. It should be noted that the cost to government per non-tertiary student has been computed by the NTCE to be one-third that of tertiary students. The study also revealed that Government funding of the polytechnic is woefully inadequate. The current costs of training a polytechnic student is presented in Table 4.12

Table 4.12 Recurrent Cost Per Student

PROGRAMME	EXPENDITURE PER STUDENT (¢)	
	TERTIARY	NON-TERTIARY
Applied Science	2,083,204	694,401
Business	1,153,693	384,564
Catering	2,403,527	801,176
Engineering	2,604,004	860,001
Secretaryship	1,922,822	640,941
Statistics	943,718	-

Source: NCTE (1999) Medium-Term Expenditure Budget for 2000-2002

When Table 4.12 is set against Table 4.11, the magnitude of the shortfall in government funding per student is vividly portrayed. For example, while it costs ¢2,604,004 to train an engineering student at the HND level, the funds provided by government amounted to only 36 percent and 15 percent of what is required on average by Ho and Kumasi respectively.

4.8.2 Internally Generated Income

Government currently devotes around 40 percent of its budget to the education sector. Out of this amount, the tertiary education sub-sector consumes up to 12.5 percent (Adu and Magaye, 1995). With so many competing demands from the other sectors of the economy and sub-sectors of education, especially basic education, the level of expenditure on tertiary education may not be sustainable. It is for this reason that tertiary education institutions are expected to explore other sources to generate additional revenue.

In a study undertaken for the World Bank during its Mid-Term Review of the Tertiary Education Project, Adu and Magaye (1995) identified six main sources of income generation for tertiary institutions. These are fees, investment income, commercial activities, production units, service organisation and consultancies. Out of these, fees

have taken the prime place as the major source of income for the polytechnics apart from government grants. Revenue from other sources is either negligible or non-existent. The polytechnics charge fees as part of their cost recovery efforts. As indicated in Table 4.13, tuition fees collected from non-tertiary students constitute the greatest source of income. In Sunyani for instance, this contributed 42.5 percent. The corresponding figures for Accra, Ho and Kumasi are 39.5 percent, 26.4 percent and 23.1 percent respectively. This is not surprising because Sunyani has the highest number of non-tertiary students among all the institutions studied. The sale of application forms, and registration and admission fees are also major sources of revenue. For example, in Ho the sale of application forms generated 24 percent while registration/admission fees contributed 16.4 percent. One other source, which has a great potential for generating more revenue, is the Academic Facility User Fees. These contributed as much as 20.7 percent of internally generated income for Kumasi and 16.1 percent for Sunyani.

Table 4.13 Internally Generated Revenue

SOURCE	ACCRA		HO		KUMASI		SUNYANI	
	Amt. (¢)	%	Amt. (¢)	%	Amt. (¢)	%	Amt. (¢)	%
Sale of Application Forms	126	19.1	81	24.0	205	18.1	34	9.1
Registration/Admission Fees	104	15.8	55	16.4	111	9.8	56	15.1
Tuition Fees (Part-Time Students)	260	39.5	89	26.4	262	23.1	158	42.5
Examination Fees	92	14.0	45	13.4	90	8.0	30	8.1
Academic Facility User Fees	-	-	45	13.4	235	20.7	60	16.1
Sports Fees	20	3.0	11	3.3	23	2.0	9	2.4
Health Services	16	2.4	-	-	48	4.5	-	-
Hall Accommodation	36	5.5	-	-	94	8.3	25	6.7
Staff Accommodation	2	0.3	0.3	0.1	3	0.3	-	-
Use of Polytechnic Facilities	3	0.4	-	-	-	-	-	-
Miscellaneous	-	-	10	3.0	62	5.5	-	-
TOTAL	659	100	336..3	100	1133	100	372	100

Source: Author's Field Survey, 2000

However, this is also one of the greatest flashpoint in the relationship between students and the polytechnic authorities. In all the institutions surveyed, all the students responded that the fees charged currently are too high. Indeed, polytechnic students across the country have gone on demonstrations on more than one occasion protesting the high fees.

4.8.3 Educational Expenditure

The current expenditure distribution pattern indicates how institutional financial resources are utilised in the critical areas. These areas are as follows:

Direct Teaching Costs: These cover the costs of teaching departments including personal emoluments of staff and the procurement of teaching and learning resources.

General Education Expenses: These consist of general expenses of academic nature not attributable to any specific department, including examinations, staff and curriculum development.

Library Costs: These are made up of expenditure of the central library as well as departmental libraries.

Central Administration Costs: They are made up of expenditure items in the Principal's Office, Secretary's Office, Finance Office, Internal Auditor's Department and Council Expenses.

Staff and Student Facilities Cost: Expenditure items here include Health Services, Staff Welfare Services, Bulk Utilities and Transport Services.

The actual expenditure made by the institutions according to the expenditure functions and norms is presented in Table 4.14. It can be seen that all the institutions except Accra operate around the norm of 70 percent for Direct Academic Costs. Ho allocated the highest amount of 72.8 percent while Accra allocated the least amount of 53 percent. A critical examination of the individual components of Direct Academic Costs also portrays a disturbing picture. For example, while Ho and Sunyani operate around the norm for Library Expenditure by allocating 12.8 percent and 9.7 percent respectively, Accra and Kumasi provided only 0.8 percent and 2.4 percent respectively. In the area of Administrative Costs all the institutions also operate around the norm of 30 percent except for Accra which allocated as much as 47 percent. Accra therefore is devoting a disproportionate part of its resources to Administrative Expenditure to the detriment of Direct Academic Costs. This is obviously bound to affect the quality of its teaching as funds available for the procurement of teaching and learning resources are diminished.

Table 4.14 Distribution of Recurrent Expenditure by Function

EXPENDITURE ITEM	ACCRA		HO		KOFORIDUA		KUMASI		SUNYANI		NORM
	(¢m)	%	(¢m)	%	(¢m)	%	(¢m)	%	(¢m)	%	%
Academic Expenditure	449.2	28.7	839.4	58.5	NA		781.0	59.3	471.9	47.9	55
General Education Expenditure	367.4	23.5	21.3	1.5	NA		75.0	5.7	71.1	7.2	5
Library Expenditure	12.7	0.8	183.7	12.8	NA		31.0	2.4	96.3	9.7	10
Sub-Total Direct Academic Cost	829.3	53.0	1044.4	72.8			887.0	67.4	639.3	64.8	70
Administrative Expenditure	490.5	31.4	86.0	6.0	NA		202.0	15.3	211.9	21.5	6
Staff & Student Facilities	61.4	3.9	143.4	10.0	NA		15.0	1.1	48.1	4.9	10
Municipal Services	176.0	11.2	143.4	10.0	NA		193.0	14.7	48.1	4.9	10
Miscellaneous Expenditure	7.2	0.5	17.0	1.2	NA		19.4	1.5	38.5	3.9	4
Sub-Total Administrative Cost	735.1	47.0	389.8	27.2			429.4	32.6	346.6	35.2	30
TOTAL RECURRENT EXPENDITURE	1564.4	100.0	1434.2	100.0			1316.4	100.0	985.9	100.0	100.0

Note: NA = Not Available

Source: Author's Field Survey, 2000

4.9 Graduate Output

The output of the polytechnic system is the graduates, the quality of which can be measured in terms of the class of diploma or degree obtained. From the 1994/95 academic year to 1997/98, the three polytechnics in Accra, Ho and Kumasi had turned out a total of 4558 HND graduates. As indicated in Table 4.15, 3 percent had 1st Class; 32 percent, 2nd Class Upper; 58 percent 2nd Class Lower; and 7 percent ordinary passes. Accra registered the highest number of graduates with 1st and 2nd Class Upper, that is, 4 percent and 37 percent respectively, followed by Kumasi 3 percent and 37 percent respectively, and Ho 1 per cent and 23 percent respectively.

There is no standard against which these performances can be measured. However, the proportion of students who obtained 1st Class and 2nd Class Upper classifications can be a useful indicator of the quality of graduates produced. When this yardstick is applied, it can be seen that Accra performed better with 41 percent of graduates in these two categories, followed by Kumasi 33 percent and Ho 24 percent. By the 1997/98 academic year Koforidua and Sunyani had not yet produced their first batch of graduates.

Table 4.15 Graduate Output by Class 1994/95 - 1997/98

INSTITUTION/ DISCIPLINE	1ST		2ND UPPER		2ND LOWER		PASS		TOTAL
	No.	%	No.	%	No.	%	No.	%	No.
ACCRA									
Engineering	26	3	285	38	392	53	42	6	745
Applied Science	12	5	82	33	151	61	3	1	248
Business/Mgt.	44	4	477	38	707	56	30	2	1258
SUB-TOTAL	82	4	844	37	1250	56	75	3	2251
HO									
Engineering	5	3	74	37	112	57	6	3	197
Applied Science	6	2	70	31	137	61	13	6	226
Business/Mgt.	1	1	93	15	417	66	116	18	627
SUB-TOTAL	12	1	237	23	666	63	135	13	1050
KUMASI									
Engineering	13	3	122	30	250	62	20	5	405
Applied Science	13	5	73	28	144	56	28	11	258
Business/Mgt.	17	3	184	31	349	59	44	7	594
SUB-TOTAL	43	3	379	30	743	60	92	7	1257
TOTAL	137	3	1460	32	2659	58	302	7	4558

Source: Author's Field Survey, 2000

5.1.2 Teaching Staff Qualifications

The study concluded that the polytechnics are short of qualified teaching staff. The fact that a majority of the staff fall into the Senior Instructorship grade and below is an indication of the low level of their qualifications as only those with first degrees and below are appointed into these grades. Appointment into Lectureship grades requires a post-graduate degree or its equivalent.

Although it can be said that the situation improved a little due to the staff development component of the TEP, the focus was on first-degree training for those staff with lower qualifications. Only three staff from each institution have benefited from the post-graduate component at the KNUST. They are yet to complete their studies.

The inability of the polytechnics to recruit and retain adequately qualified staff is due to the low level of remuneration and poor conditions of service as compared to what pertains in the universities and in the private sector. For example, while the minimum requirement for teaching in both the polytechnics and the universities remain the same, that is, MSc/MA/MPhil, the polytechnic lecturer receives a lower salary than his counterpart in the university. Consequently, the polytechnics continue to lose their better-qualified staff to the universities and the private sector.

5.1.3 Student/ Teacher Ratios

The study revealed that student: teacher ratios are very high as compared to the norm. This is also an indication of the high degree of understaffing that the polytechnics have to contend with. The worst affected programmes are those in Business and Management Studies, and Engineering. The Applied Sciences appear to be better off.

In a situation of high student: teacher ratios, there are two options opened to the polytechnics, namely, either to increase the number of lecturers or to reduce the intake of students. The second option appears to be the obvious choice since enrolment rates already exceed the target. In any case, the polytechnics currently find it difficult in recruiting the right calibre of staff and asking them to increase the number would mean their going in for less qualified staff. This would have negative implications for quality teaching.

5.1.4 Physical Infrastructure

Under the TEP some selected buildings were rehabilitated and a few new ones constructed. The study revealed that all these buildings are still in good condition. The number of classrooms available in each polytechnic is adequate. However, the same cannot be said of the workshops and libraries. The number of workshops available in each polytechnic is very much limited. The libraries are housed temporarily in classrooms and the newly constructed Non-Residential Students' Facilities. The use of the latter as a library negates the very purpose for which it was built, that is, as a resting place and reading room for non-resident students in-between lectures.

5.1.5 Equipment

Some workshop and laboratory equipment were supplied to the polytechnics under the TEP. Although, these have come to replace the obsolete equipment, these are clearly not enough. This can be attested to by the fact that the polytechnics continue to rely on the KNUST for practical work at a very great cost to themselves. Since the polytechnics are already starved of funds, the likelihood is that they might be cutting down on the practical component of the course curricula. This would have serious repercussions for the adequacy of their training since by their very nature polytechnic courses are practical oriented.

5.1.6 Programme Accreditation

Programme accreditation ensures that institutions have the physical, material, financial and human resources necessary for the delivery of quality education. NAB is the main quality assurance agency charged to undertake the accreditation of programmes in the polytechnics. With the exception of a few programmes at Koforidua, Kumasi and Sunyani, all the institutions have received one form of approval or the other for their programmes. However, the issue is what happens when the accreditation status granted the institutions lapses? Will NAB stop them from continuing with the programme? Will government accept the recommendation of NAB to prevent the institutions from running the affected programmes since they are public institutions owned and funded by the government? Answers to these questions

will help to further clarify the authority and role of NAB in ensuring that the institutions deliver quality education.

5.1.7 Governance and Management

Good management practices have a very great effect on achieving quality education. A number of tools have been identified as key to achieving good governance in the polytechnics. These include the Polytechnic Council, Academic Board, Planning Unit, *"Financial and Stores Regulation"* and Students Handbook.

The study revealed that all the polytechnics have inaugurated their Councils and their Academic Boards are also functioning. All of them also apply the *"Financial and Stores Regulations"*. However, Ho and Koforidua are yet to establish the Planning Unit and Accra has not yet published a Student Handbook. The importance of these management tools has been underscored in Section 4.7 and their not being put to use is a serious lapse on the part of management of these institutions.

5.1.8 Financial Resources

The government remains largely the main source of funding for the polytechnics. The funding takes the form of monthly subventions for recurrent expenditure and capital grants for development expenditure. The focus of this study has been the grants for recurrent expenditure.

The basis for the allocation of the funds is supposed to be the number of students enrolled. However, as the study revealed this has not always been the case. There have been inconsistencies in the application of the funding. The level of funding has also been found to be grossly inadequate. It appears that funds are allocated irrespective of the cost of training the students. For example, in 1998 government expenditure per engineering student amounted to only 15 percent of what was required by Kumasi.

The inadequate funding of the polytechnics affects them in many ways, including the following:

a) Inadequate supply of teaching and learning materials.

b) Inadequate supply of books, periodicals and journals for the library.

c) Inadequate equipment for teaching and administration.

d) Inadequate number of vehicles for students' educational trips.

e) Lack of maintenance of infrastructural facilities.

With regards to internally generated income, the polytechnics do not as yet undertake any commercial ventures or consultancy work. The greatest source of income therefore is the various types of fees that students pay. Of these, tuition fees charged part-time students are the most important. This source contributes, as much as 42.5 percent in Sunyani. However, if as expected the polytechnics phase out the sub-tertiary level programmes, this source will dry up considerably.

5.1.9 Educational Expenditures

The NCTE norms for resource allocation within the polytechnics were meant to ensure that the critical areas of teaching and learning resources are not starved of funds. It was however realised that the polytechnics are not adhering strictly to these norms. For example, expenditure on the libraries at Accra and Kumasi amounted to only 0.8 percent and 2.4 percent respectively. This is a far cry from the expected 10 percent.

5.2 Policy Implications of Findings

One of the major goals of the tertiary education reform programme is to reverse the deterioration of the system, falling standards and declining quality. The government's *"White Paper on Reforms to the Tertiary Education System"* provided the framework for achieving this and the TEP has contributed immensely towards the realisation of this goal. However, as the outcome of the study revealed, there is the danger of backtracking on the gains that have so far been achieved. The following are some of the key issues that need to be addressed if the nation is to derive full benefits from the outputs of the polytechnics.

a) The uncontrolled increased in enrolment if not checked may lead to an eventual breakdown of the system as facilities are stretched to the limit. The core mandate of the polytechnics is to train middle-level manpower through the provision of full-time tertiary education. The fact that a substantial proportion of students are

still offering sub-tertiary programmes on part-time basis means that the polytechnics are less able to fulfil their core mandates and the nation may ultimately be the loser.

b) An adequate number of well-qualified teaching staff is a key component in the determination of teaching quality and impinges directly on the quality of the graduates. The inadequacy of this important human resource poses a serious challenge to capacity building in the polytechnics. This calls into question their ability to provide the right calibre of graduates to meet the nation's development needs.

c) The government's "White Paper" identifies sustainable financing as a necessary condition for improving the quality of tertiary education. It stated that a system of cost sharing would be developed between the government, the students and the private sector. The government to a very large extent remains the major financier even though the students make some contributions in the form of fees paid. The private sector is yet to play any meaningful role in financing polytechnic education even though they benefit a lot from their products.

The low level of government funding also has serious implications for the quality of the products. Without adequate financial resources it is difficult for the institutions to procure the requisite teaching and learning inputs.

d) Although the low level of funding is a major contributing factor to the problems facing the polytechnics, the inefficiency in the use of resources is also partly to blame. The situation where only 0.8 percent of resources are allocated such a critical area as the library in one instance suggests that even the limited resources are not been effectively deployed.

5.3 Recommendations

A number of areas have been identified where action needs to be taken in order not only to prevent the polytechnic education system from breaking down but also to improve upon the successes that have so far been achieved.

5.3.1 Enrolment

The rate at which enrolment levels have been increasing is rather too high. It is therefore recommended that the NCTE advise the polytechnics to freeze admission of students at current levels for the next three years. At the same time the NCTE should also insist that the institutions comply with the directive to completely phase-out sub-tertiary programmes. Tertiary students can then progressively fill the places freed up by the phasing-out of these programmes.

The NCTE should also monitor the institutions more closely in order to ensure compliance with the norm on science/ arts enrolment. The nation can only advance technologically if its manpower requirements are produced in the right proportions.

5.3.2 Teaching Staff

The quantity and qualifications of staff are key factors in determining the quality of the educational system. It is therefore very important that the polytechnics intensify their staff development efforts. They can do this by ensuring that the MTech. and BTech. programmes mounted at KNUST under the TEP are continued when the World Bank Sponsorship ends. They should take up the challenge of sponsoring their staff for these programmes. At the same time staff who wish to pursue other relevant post-graduate programmes of their choice should be assisted in securing places at the country's universities.

5.3.3 Salaries and Conditions of Service

Competitive salaries and attractive conditions of service are very crucial in the recruitment and retention of well-qualified staff in the polytechnics. Differences in salary levels between the polytechnics and the universities do not in any way help the polytechnics in their recruitment efforts. As a first step, a uniform salary structure should be adopted for all tertiary education institutions in the country. This is what

pertains in some African countries like Nigeria and South Africa. The next step should be to make the structure competitive with those in industry.

5.3.4 Physical Resources

There is an urgent need to build more workshops and these should be adequately equipped. As an interim measure to de-congest the overcrowding in the facilities, it is suggested that large class sizes of students should be split into two or more groups. This is to ensure that workshop space is available to each student during practical lessons. This same method can also be applied to situations where there are overcrowding of classrooms. The operation of a central timetabling system, which matches room sizes and class sizes, will also help to decongest classrooms.

The government should also consider it a priority to put up a library for each polytechnic. Kumasi Polytechnic has already taken the initiative by beginning the construction of a library this year. This is being funded largely from funds generated internally. It is important that the libraries be adequately stocked with current reference materials and equipped with computers so that both students and staff can take advantage of the Internet and access libraries worldwide. More photocopiers should be provided.

5.3.5 Programme Accreditation

In situations where an institution needs to remedy certain deficiencies in order to satisfy the requirement for accreditation, NAB should send copies of its reports to the government for action to be taken. As public institutions it is the responsibility of government to ensure that the polytechnics have the required resources to deliver quality education.

5.3.6 Governance and Management

Good governance promotes educational quality and there is no doubt that better management practices lead to a more effective deployment of scarce resources. There is therefore the need to improve on the internal management systems and skills of senior management personnel in the polytechnics. This can be achieved through the organisation of seminars and workshops by the NCTE. The institutions, which have not yet established planning units, should be advised to do so immediately as this is

result in appropriate selections for the NCCE. For example, the low quotas's advocation for non-salary items and teaching institutions can be withheld until there is evidence that they will comply.

5.6 Conclusions

The policy objectives of the tertiary education reforms include increasing enrolment levels, improving the quality of tertiary education and the internal governance and management of the institutions. However, as has been observed by this study, the polytechnic system is in danger of decay rather than developing in spite of the efforts of government to the contrary. The focus of the study was therefore to find answers to following specific questions:

i. How the tertiary education reform programme have able to improve the quality of the physical infrastructure in the polytechnics?

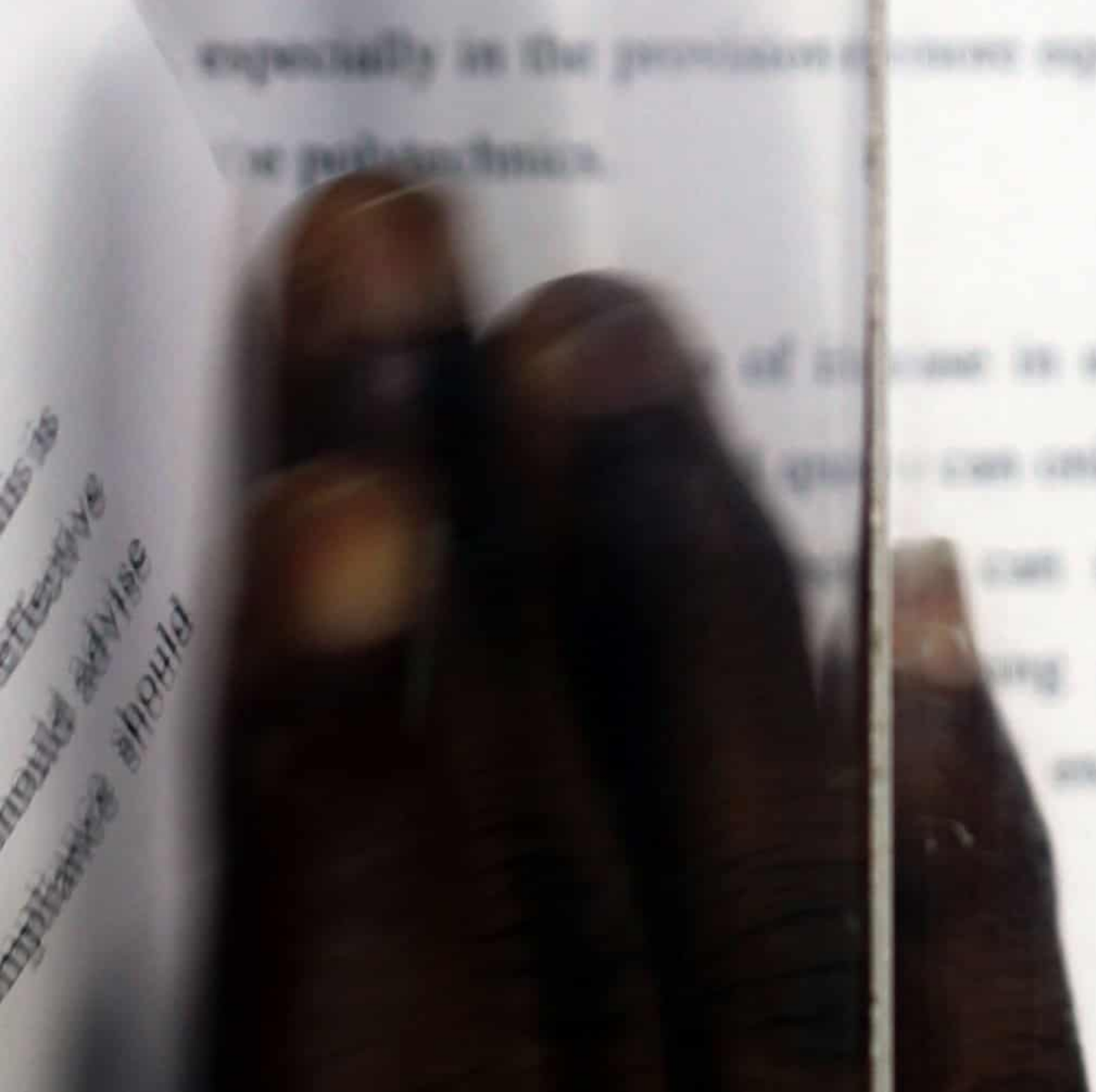
ii. Are the objectives of increasing enrolment and that of ensuring quality education compatible?

iii. What are the major problems facing the polytechnics?

iv. In the face of declining resources, how can management of the polytechnics be improved in order to ensure efficiency?

The study revealed that there have been significant improvements in the quality of the physical infrastructure. As a result of the implementation of the Tertiary Education reform, the existing physical infrastructure was rehabilitated, new facilities constructed, workshop and laboratory equipment supplied, and textbooks and other reference materials provided for the libraries. However, a lot more still needs to be done especially in the provision of new equipment and building permanent libraries for the polytechnics.

The study revealed that rapid increase in enrolment puts a lot of pressures on the quality which can only be guaranteed if enrolment is managed properly. This can significantly increase the proportion of graduating out sub-tertiary programmes. It means that limited resources are directed



result in appropriate sanctions by the NCTE. For example, the first quarter's subvention for non-salary items of defaulting institutions can be withheld until there is evidence that they will comply.

5.4 Conclusions

The policy objectives of the tertiary education reforms include increasing enrolment levels, improving the quality of tertiary education and the internal governance and management of the institutions. However, as has been observed by this study, the polytechnic system is in danger of once again deteriorating in spite of the efforts of government to the contrary. The focus of the study was therefore to find answers to following specific questions:

i. Has the tertiary education reform programme been able to improve the quality of the physical infrastructure in the polytechnics?
ii. Are the objectives of increasing enrolment and that of assuring quality education compatible?
iii. What are the major problems facing the polytechnics?
iv. In the face of dwindling resources, how can management of the polytechnics be improved in order to ensure efficiency?

The study revealed that there have been significant improvements in the quality of the physical infrastructure. As a result of the implementation of the Tertiary Education Project, the existing physical infrastructure was rehabilitated, new facilities constructed, workshop and laboratory equipment supplied, and textbooks and other reference materials procured for the libraries. However, a lot more still needs to be done, especially in the provision of more equipment and building permanent libraries for all the polytechnics.

The uncontrolled high rate of increase in enrolment puts a lot of pressures on the limited facilities. Educational quality can only be guaranteed if enrolment is managed more effectively. The polytechnics can significantly increase the proportion of tertiary students by completely phasing out sub-tertiary programmes. A more effective management of resources will ensure that limited resources are directed towards the critical areas of teaching.

The study concluded that the major problems confronting the polytechnics are those relating to inadequate financial resources, the lack of adequately qualified teaching staff, insufficient physical resources and defective management systems.

Finally, a number of proposals have been put forward which if implemented by all the stakeholders in the polytechnic system will go a long way in sustaining the quality of the teaching and learning environment.

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APPENDIX A

DEPARTMENT OF PLANNING

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

QUESTIONNAIRE FOR POLYTECHNIC ADMINISTRATORS

This study is a postgraduate research project designed to assess the quality of the teaching and learning environments in the polytechnics in Ghana. This questionnaire is meant to solicit information as part of the study. Your responses will be treated with the utmost confidentiality.

You are therefore entreated to please respond as appropriate and sincerely.

Name of Polytechnic:.....

Date of Establishment:.....

Name of Respondent:.....

Position of Respondent:.....

SECTION 1: ENROLMENT

Table 1 A: HND ENROLMENT BY SCHOOL AND PROGRAMME 1998/99 ACADEMIC YEAR

SCHOOL	PROGRAMME	ENROLMENT		
		M	F	T
ENGINEERING	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL ENG.				
APPLIED SCIENCE	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL APPLD. SC.				
BUSINESS & MANAGEMENT	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL BUS. & MGT.				
TOTAL ENROLMENT				

Table 1 B TERTIARY NON-HND ENROLMENT BY SCHOOL AND PROGRAMME 1998/99

SCHOOL	PROGRAMME	ENROLMENT		
		M	F	T
ENGINEERING	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL ENG.				
APPLIED SCIENCE	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL APPLD. SC.				
BUSINESS & MANAGEMENT	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL BUS. & MGT.				
TOTAL ENROLMENT				

Table 1 C: NON-TERTIARY ENOLMENT BY SCHOOL AND PROGRAMME 1998/99

SCHOOL	PROGRAMME	ENROLMENT		
		M	F	T
ENGINEERING	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL ENG.				
APPLIED SCIENCE	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL APPLD. SC.				
BUSINESS & MANAGEMENT	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
SUB-TOTAL BUS. & MGT.				
TOTAL ENROLMENT				

SECTION 2: STAFFING

Table 2 A: ACADEMIC STAFF NUMBERS BY SCHOOL AND DEPARTMENT

SCHOOL/DEPARTMENT	PRIN. LECT.	SNR LECT.	LECT.	ASSIST. LECT.	PRIN. INSTRUCTOR	SNR INSTRUCTOR	INSTRUCTOR	ASSIST. INSTRUCTOR	TOTAL
ENGINEERING									
1									
2									
3									
4									
5									
6									
7									
8									
9									
SUB-TOTAL ENG.									
APPLIED SCIENCE									
1									
2									
3									
4									
5									
SUB-TOTAL APPLD. SC.									
BUSINESS & MGT.									
1									
2									
3									
4									
5									
SUB-TOTAL APPLD. SC.									
TOTAL									

Table 2B: QUALIFICATION OF TEACHING STAFF BY SCHOOL AND DEPARTMENT

SCHOOL/DEPARTMENT	POSTGRADUATE DEGREE OR EQUIVALENT	BACHELORS DEGREE OR EQUIVALENT	BELOW 1ST DEGREE	TOTAL
ENGINEERING				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
SUB-TOTAL ENG.				
APPLIED SCIENCE				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
SUB-TOTAL APPLD. SC.				
BUSINESS & MANAGEMENT				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
SUB-TOTAL BUS. & MGT.				
TOTAL				

SECTION 3: GRADUATE OUTPUT

Table 3: GRADUATE OUTPUT BY HND PROGRAMME

SCHOOL/PROGRAMME	1994/95					1995/96					1996/97					1997/98					1998/99					TOTAL				
	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T
ENGINEERING																														
1																														
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
SUB-TOTAL ENG.																														
APPLIED SCIENCE																														
1																														
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
SUB-TOTAL APPLD.SC.																														

SCHOOL/PROGRAMME	1994/95					1995/96					1996/97					1997/98					1998/99					TOTAL				
	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T	1	2U	2L	P	T
BUSINESS & MGT.																														
1																														
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
SUB-TOTAL BUS. & MGT.																														
TOTAL																														

SECTION 4: ACCREDITATION

Table 4: ACCREDITED PROGRAMMES

SCHOOL	ACCREDITATION STATUS		
	FULL	INTERIM	NOT ACCREDITED
ENGINEERING			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB-TOTAL ENG.			
APPLIED SCIENCE			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB-TOTAL APPLD.SC.			
BUSINESS & MANAGEMENT			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
SUB-TOTAL BUS. & MGT.			
TOTAL			

SECTION 5: FINANCING

Table 5 A: GOVERNMENT SUBVENTION (1998)

ITEM	BUDGETED (¢m)	ACTUAL (¢m)
Recurrent		
Personal Emolument (Item 1)		
Non- Salaries (Item 2-5)		
Sub-Total (Items 2-5)		
Development (PIP)		
TOTAL		

Table 5B: INCOME GENERATED 1998

SOURCES	AMMOUNT (¢ m)
Sale of Application Forms	
Registration and Admission Fees	
Tuition Fees (Part-Time Students)	
Examination Fees	
Academic Facilities User Fees	
Sports Fees	
Health Services	
Hall Accommodation	
Staff Accommodation	
Use of Polytechnic Facilities	
Others (Specify)	
TOTAL	

Table 5 C: RECURRENT EXPENDITURE 1998

DISTRIBUTION OF RECURRENT EXPENDITURE	RECURRENT EXPENDITURE		
	ITEM 1	ITEMS 2-5	TOTAL
Academic Expenditure			
General Education Expenses			
Library Expenditure			
Sub-Total Direct Academic Costs			
Central Administration Expenditure			
Staff and Students Facilities			
Municipal Services			
Miscellaneous Expenditure			
Sub-Total Administrative Costs			
Total Recurrent Expenditure			

SECTION B

1. State the numbers of the following categories of physical facilities:

FACILITY	NUMBER
Classrooms/Lecture theatres	
Workshops	
Laboratories	
Studios	
Others (Specify)	

2. How many computers do you have available for training students? .....

3. Do you consider this number to be adequate or inadequate? ☐ Yes ☐ No

4. Do you have a permanent Library? ☐ Yes ☐ No

5. If No, then where is the library located? .....

6. What is the sitting capacity of the library? .....

7. Do you consider the sitting capacity to be adequate? ☐ Yes ☐ No

8. What is the size of your library holdings in terms of

   Books .....

   Journals/Periodicals .....

9. Do you consider the size of the library holdings to be adequate or inadequate in relation to your students' population? .....

10. How many computers do you have in the library for use by students and staff? ...

11. Are the computers connected to the Internet? ☐ Yes ☐ No

12. Do you have photocopiers in the library? ☐ Yes ☐ No

13. The Polytechnic Law requires that each polytechnic has a Governing Council. Has yours been inaugurated? ☐ Yes ☐ No

14. If no, state the reasons why it has not been inaugurated?

a.) .....

b.) .....

c.) .....

15. Do you have a functioning Academic Board? ☐ Yes ☐ No

16. Have you published a students' handbook? ☐ Yes ☐ No

17. If yes, are copies available to all your students? ☐ Yes ☐ No

18. Do you apply the 'Financial & Stores Regulations' compiled for the polytechnics? Yes ☐ No ☐

19. If no, what are your reasons for not using it?

a.) .....

b.) .....

c.) .....

20. Please, state the private sector's contribution to the financing or resourcing of the polytechnic.

a.) .....

b.) .....

c.).....

APPENDIX B

DEPARTMENT OF PLANNING

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

QUESTIONNAIRE FOR DEPARTMENTS

This study is a postgraduate research project designed to assess the quality of the teaching and learning environments in the polytechnics in Ghana. This questionnaire is meant to solicit information as part of the study. Your responses will be treated with the utmost confidentiality.

You are therefore entreated to please respond as appropriate and sincerely.

Name of Polytechnic:.....

Name of Department: .....

Name of Respondent:.....

Position of Respondent:.....

1. What programmes do you offer in the department?
   (a) .....
   (b) .....
   (c) .....
   (d) .....

2. Are all the programmes offered accredited? ☐ Yes ☐ No

3. If programmes are not accredited, assign reasons.
   (a) .....
   (b) .....
   (c) .....
   (d) .....

4. State the number of teaching staff with the department.

Category	Number		
	M	F	T
Full-Time			
Part-Time			
Total			

5. State the number of teaching support staff with the department.

Category	**Number**		
	M	F	T
Administrative			
Senior Technical			
Junior Technical			
TOTAL			

6. Do you have an approved syllabus for your HND programme?
   ☐ Yes ☐ No

7. Who designed the syllabus? .....

8. Do you consider the contents of the syllabus suitable for the programme(s) that you offer? ☐ Yes ☐ No

9. Give reasons for your answer to Questions 8.

(a) .....

(b) .....

(c) .....

(d) .....

10. How often do you review the syllabus?

.....

11. List the major teaching methods used by your lecturers (e.g. Lectures, Seminars, Tutorials, etc.)

(a) .....

(b) .....

(c) .....

(d) .....

12. Give your assessment of the adequacy or otherwise of the following physical facilities where applicable. (Tick as appropriate)

Facility	Adequate	Inadequate
Classrooms/Lecture Theatres		
Workshops/Laboratories/Studios, etc.		
Equipment		

13. Do your students undertake supervised industrial attachment? ☐ Yes ☐ No

14. If yes, what is the average number of students that secure places each year?

(Express your answer as a percentage. E.g. 50%, 60%)

15. State any special problems faced by the department?

(a) .....

(b) .....

(c) .....

(d) .....

APPENDIX C

DEPARTMENT OF PLANNING

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

QUESTIONNAIRE FOR STUDENTS

ASSESSMENT OF TEACHING AND LEARNING RESOURCES IN THE POLYTECHNICS

This study is a postgraduate research project designed to assess the quality of the teaching and learning environments in the polytechnics in Ghana. This questionnaire is meant to solicit information as part of the study. Your responses will be treated with the utmost confidentiality.

You are therefore entreated to please respond as appropriate and sincerely.

Name of Polytechnic:.....

Name of Department: .....

1. Please indicate how relevant and adequate the course content of your programme is for you chosen profession/discipline. (Tick as appropriate).

Very relevant ☐

Relevant ☐

Not relevant ☐

2. Give reasons for your answer to Question 1.

.....

.....

.....

.....

3. How do you consider the quality of delivery of the course content in terms of teaching methods used by your lecturers?

Excellent ☐

Good ☐

Average ☐

Below average ☐

4. Do you receive adequate feedback from your lecturers on your continuous assessment? ☐ Yes ☐ No

5. What is your class size in terms of number of students? .....

6. Do you consider the classroom space to be adequate? ☐ Yes ☐ No

7. Do you consider the workshops/laboratories/studios spaces to be adequate?

☐ Yes ☐ No

8. Give an assessment of the quality and number of workshop equipment and computers used by students in your department. (Tick as appropriate).

	Equipment	Computers
Good quality and adequate		
Good quality but inadequate		
Poor quality and inadequate		
Not available		

9. Do you think the library has enough sitting space for students?

☐ Yes ☐ No

10. What is your opinion of the adequacy of reference books, journals and periodicals in the library?

Adequate and current ☐

Adequate but out of date ☐

Inadequate but current ☐

Inadequate and out of date ☐

Not available ☐

11. How many photocopiers do you have in the library? .....

12. Do you consider the number to be adequate? ☐ Yes ☐ No

13. What is your opinion about the level of fees charged by the polytechnic?

Too high ☐

High ☐

Just alright ☐

Low ☐

Too low ☐

14. How much SSNIT loan do you receive in a year? ¢.....

15. Is this amount adequate for your needs? ☐ Yes ☐ No

16. If No, how much would you consider adequate? ¢.....

17. How would you rate your employment prospects?

Excellent ☐

Good ☐

Average ☐

Below average ☐