MEETING NCTE AND NABPTEX STANDARDS BY POLYTECHNICS IN GHANA:

EXPLORING THE REALITIES

BY

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DECLARATION

I hereby declare that this submission is my own work towards the MSc. in Development Policy and Planning and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university or any other university, except where due acknowledgement has been made in the text.

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ABSTRACT

The Polytechnics run two main programmes namely Engineering, Applied Science and Technology, and Applied Social Science and Arts. Most students enter Polytechnic Institutions with aggregates of between 21 and 29 of the West Africa Senior Secondary Certificate Examination (WASSCE)/Senior Secondary Certificate Examinations (SSCE) results and the ACCESS course organised by NABPTEX for technical and vocational students. Students prefer university education to polytechnic and they would have entered the university if they had satisfied the requirement of university education.

The enrolment of Business related programmes in the five selected polytechnics stand at 21790 with staff strength of 277. This puts the staff-student ratio at 1:79. For the Science/Technology programmes, the enrolment stands at 11386 while the staff strength stands at 171. The staff/student ratio is 1:67. The average of both ratios stands at 1:73. This far exceeds the national norm of 1:12 for sciences and 1:18 for business related programmes averaging at 1:15 for all courses in all the polytechnics in Ghana. Large class size adversely affects teacher delivery. Management of Polytechnic Institutions have divided large classes into 2 or more classes. This innovation improves the staff/student ratio to about 1:35. The ratio of enrolment of Science/Technology to Business related programmes far exceeds the accepted norm of 60:40. Out of the 1327 full time teaching staff, 43.86 percent have a second degree. The implication is that the remaining 51.14 percent are not qualified to handle HND (according to NCTE standards). In terms of ranks, 1.73 percent of teaching staff were principal and senior lecturers instead of the acceptable 20 percent. In the same vein, the percentage of senior instructors and instructors fell short of about 17 percent

of the norm (i.e 12.81 percent instead of 30 percent). However, 82.5 percent were principal instructors and lecturers. This far exceeds the standard of 50 percent.

Facilities (workshop tools and laboratory equipment, library books, projectors, internet facilities etc.) were not very adequate in all selected schools. Most workshop tools and laboratory equipment need replacement. Only one institution had its main library connected to the internet. Teaching staff use approved syllabus which is reviewed every ten years. Examination questions go through NABPTEX moderation and examinations are conducted under strict conditions. Industrial attachment plays a significant role in the training of polytechnic students; however students do not get the right institutions for attachment and so the relevance of it is not much felt.

The output of polytechnic education in terms of the HND results is not encouraging. The research revealed a downward trend of the number of students with first and second upper class divisions and an upward trend of the number of students with second lower and third class divisions from 2007 – 2010.

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ACRONYMS

ABCE	Advance Business Certificate Examinations
BBC	British Broadcasting Corporation
CBL	Competency Based Learning
BTECH	Bachelor of Technology
CTC	Construction Technician Course
EET	Electrical Engineering Technicians
GPRS	Growth and Poverty Reduction Strategy
GCE	General Certificate Examination
GES	Ghana Education Service
GPA	Grade Point Average
GEA	Ghana Employers Association
HND	Higher National Diploma
HRD	Human Resource Development
ICT	Information and Communication Technology
ILO	International Labour Organisation
KNUST	Kwame Nkrumah University of Science and Technology
MDG	Millennium Development Goals
MOE	Ministry of Education
MET	Mechanical Engineering Technicians
MOESS	Ministry of Education Science and Sports
NAB	National Accreditation Board
NABPTEX	National Board for Professional and Technician Examination

NACVET	National Coordinating Committee for Technical and Vocational Education and Training
NCTE	National Council for Tertiary Education
SSCE	Senior Secondary Certificate Examination
SPSS	Statistical Package for Social Surveys
TEP	Tertiary Education Project
TVET	Technical Vocational Education and Training
UNESCO	United Nations Educational Scientific and Cultural Organisation
WASSCE	West Africa Senior Secondary Certificate Examination

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE: BACKGROUND TO THE STUDY

1.1 Introduction

Polytechnic Education in Ghana

Polytechnics are higher educational institutions responsible for training in scientific and technical subjects. In line with government's educational reform policies, Polytechnics were established in all the ten regional capitals in Ghana following the promulgation of the Polytechnic Law, 1992 (PNDC Law 321). The law establishing the Polytechnics gave them the following mandates:

- to provide tertiary education through full time courses in the field of manufacturing, commerce, science, technology, applied social science, applied arts and such other areas as may be determined by the authority for the time being responsible for higher education;
- to encourage study in technical subjects at tertiary level; and
- to provide opportunity for development, research and publication of research findings.

The Polytechnics in Ghana were first established as technical institutes that offered craft courses. In 1960, following the industrial development policy and rapid technological progress in a broad range of areas, technical education became a necessity for the country. Since the technical institutions (polytechnics) were offering second-cycle craft courses while the universities were offering higher tertiary courses, there was a gap in the manpower supply needs of the country (Nsiah Gyabaah 2005). In recognition of this, a number of technical institutes were established to train lower and middle level skilled manpower to fill the gap. These technical institutes were established in the golden triangle i.e. Accra, Kumasi and Takoradi.

Accra Polytechnic, the oldest of the Polytechnics in Ghana begun in 1949 as a Technical School and re-designated later as a Technical Institute in 1957 and then a Polytechnic by a Presidential order in 1963. Even though it was re-designated as a Polytechnic, it remained under the Ghana Education Service (GES) as a second-cycle institution until 1993 when it was upgraded to tertiary status after the promulgation of the Polytechnic Law. Kumasi and Takoradi Polytechnics began in 1954 as Technical Institutes and later re-designated as Polytechnics in 1965 but still as a second-cycle institution under GES until it was elevated to tertiary status in 1993. Ho Polytechnic also began as a Technical Institute in 1968, became a Polytechnic in the same year and elevated from second-cycle status under GES to tertiary status in 1993. Tamale Polytechnic was established in 1950 as a Technical Institute and later to a Polytechnic in 1993. Sunyani Polytechnic came into existence as a Technical Institute in 1967 but elevated to a tertiary status as a Polytechnic in 1997. Cape Coast, Koforidua, Bolgatanga and Wa Polytechnics were established in 1993, 1997, 1998 and 1999 respectively as tertiary institutions (Agodzo, 2007).

The White Paper which gave prominence to Polytechnic education following the promulgation of the Polytechnic Law, 1992 (PNDC Law 321) specifically stated that the polytechnics have a distinct and important role to play in middle-level manpower development, and programmes and courses were to be offered at the middle-level of technical training leading to the award of Higher National Diplomas (HND) but not departing from syllabi dedicated to practical training. The provision of such programmes will complete the cycle of technical education and provide a capacity for higher-level technician training and practical research (MOE, 1993).

1.1.2 ISSUES OF TERTIARY EDUCATION IN GHANA

According to Odamtten (1993), Ghana had only two tertiary institutions (public universities) at the time of independence. The last decade has witnessed phenomenal growth. Ghana has six public universities, 29 accredited private (local- and foreign-owned) university colleges, 10 public polytechnics and several other professional/specialized (both public and private) tertiary institutions as of 2007 (NCTE, 2006). This growth can be interpreted to mean high demand for tertiary education. On average, only about forty-nine percent (49%) of qualified applicants gain admission to the public universities creating a demand-supply gap of about fifty-one percent (51%) (Oduro & Senadza, 2004). The expansion of tertiary institutions has not been able to meet the increasing demand for tertiary education. There is a general problem of access to tertiary education in the country. Access could be defined as places and facilities available for potential applicants (GPRS II, 2006). This problem, according to GPRS II (2006) is attributable to limited physical infrastructure to admit all those who qualify for admission to tertiary institutions. Available statistics indicate that from 1996-2001, only about thirty-two percent (32%) on the average, of qualified applicants gained admission into the universities and about fifty-four percent (54%) of qualified applicants entered the polytechnics. The figures have not changed much over the period. For the 2005/2006 academic year, 55% of qualified applicants were admitted into all the public universities and 78% into the polytechnics. For the same period, statistics indicate that the male-female ratio for both the universities and polytechnics has increased slightly meanwhile the gap is still very wide. In 2005/2006 academic year the male to female enrolment ratio was 65:35 for the universities and 70:30 for the polytechnics. This is far below the national norm of 50% males to 50% females (NCTE 2006).

The underlying factors that have been identified by Oduro and Senadza (2004), as accounting for the situation of limited access to tertiary education include the following:

- Existing tertiary institutions are unable to meet the high demand for tertiary education, which has arisen out of the rapid growth in population and the expansion in pre-tertiary education, following the introduction of the educational reforms in 1987.
- Mismatch between existing academic facilities and physical infrastructure on the one hand, and the increasing number of students admitted into tertiary institutions on the other.

1.2 The Statement of the Problem

Right from independence Ghana has always identified and prioritized technical vocational education and training (TVET) as the sector for providing its middle level manpower base for accelerated development (Odamtten 1993). The establishment of technical schools and polytechnic institutions was expected to lead to increases in the middle-level technical manpower base of the country. The Polytechnic Law, 1992 (PNDC Law 321) assigned appropriate aims and objectives which the polytechnics are to strive to achieve. PNDC Law 321 also gave legal backing to desirable changes in polytechnic administration, course, structure, grading, certification and staffing. Polytechnic institutions have their own governing boards or councils and the right to design their own curricula, plan their management and development activities.

In the performance of their functions, a number of key institutions have been set up to coordinate the activities of the polytechnics to ensure quality of programmes and award diploma certificates to students. The institutions are the Ministry of Education

(MOE), National Council for Tertiary Education (NCTE), National Accreditation Board (NAB), and the National Board for Professional and Technician Examinations (NABPTEX). These institutions have succeeded in ensuring quality in the polytechnics to some extent by setting standards which polytechnic institutions are expected to conform. The statement of the problem is to examine whether polytechnic institutions conform to standards of their regulatory bodies.

As tertiary institutions, the polytechnics continue to face some challenges that are seriously affecting the quality of teaching and learning. One major problem faced by polytechnics is staffing. The Polytechnics face serious staffing problems when they were upgraded from second cycle institution to tertiary institutions. Inadequate qualified and professional staffing presented problems for teaching, learning and research (Nyarko, 2011). At the beginning of the Polytechnic upgrading exercise in 1993/94 academic year, only 2% of the academic staff had postgraduate qualification but by 2002, the number had risen to 28% (Afeti, 2004S). In the 2003/2004 academic year, the ratio of Principal lecturers to Senior Lecturers was less than on percent (0.4%) compared to NCTE accepted norm of twenty percent (20%), that of Lecturer and Principal Instructor was about forty percent (39.8%) compared to NCTE standard of 50% and for Senior Lecturer and Instructor, with a standard ratio of 30%, the category recorded 59.8% (Afeti 2004)

Inadequate workshops, tools, laboratory equipment and other academic facilities also affect quality of delivery in the polytechnics. Most of the polytechnic institutions still rely on Kwame Nkrumah University for Science and Technology (KNUST) for practical training due to inadequate facilities in the polytechnics. When KNUST is in

session the Polytechnic students do not have access to these laboratories or workshops; they do not have therefore sufficient exposure to the required number of practical hours per session. The situation could be attributed to poor funding. The growth of polytechnic education has always been constrained by costs. GETfund has helped to increase funding from 28 percent of assessed requirements in 1998 to 58 percent in 2000 (Effah 2003), but this is still inadequate to increase the availability of equipment and instructional materials. Library facilities are inadequate in most polytechnics. Some departments do not have their own libraries and rely on the institution's main library. Facilities in the libraries are overstretched due to high student-facility ratio.

Another major problem faced by the polytechnics is the slow progress in the area of technical vocational education and training (TVET). In recent years, (e.g. from 2002 to 2006) enrolment in TVET has stagnated at about 18000 students (MOESS 2006). Enrolments in the 10 polytechnics have increased substantially; the increases have significantly been in business related programmes and not in science and technology programmes. This is happening despite the government approved norms of 60:40 for science/technology programmes against business related programmes.

The general increase in enrolment puts pressure on the limited facilities available and affects quality delivery. The problem of inadequate classrooms and laboratories to accommodate the growth in student members goes hand on hand with the problem of inadequate equipment which adversely affects practical training of students. The situation poses a major threat to Competency Based Training (CBT) which is widely supported by the government as fulfilling the purpose of upgrading polytechnics to

tertiary status. NCTE has approved a student teacher ratio of 1:12 for engineering courses, 1:15 for applied sciences and 1:20 for management programmes. The increase in enrolment and the number of qualified staff make conformity to these standards a challenge. It is also worth mentioning that the increase in enrolment is skewed in favour of male students. In 1997/98 academic year for instance, the enrolment of women as a percentage of total enrolment was 20.51% in polytechnic institutions of Ghana (NCTE 1998).

Examination malpractices in its various forms occur in both internal and external examinations in polytechnic institutions. This has serious implications on the quality of the Higher National Diploma (HND) certificate. This situation has been attributed to deviations from NABPTEX approved procedures for the assessment and conduct of examinations and the processing of examination results (Apori et al 2008).

The research was motivated in response to the various identified problems of polytechnic institutions in the country. The purpose of the study is to assess the extent to which polytechnics conform to NCTE and NABPTEX standards and to find explanations for deviations.

1.3 Research Questions

Based on the above mentioned problems the study seeks to answer the following questions:

- To what extent do polytechnics meet NCTE requirements of teaching staff qualification for HND programmes?

- How are students and staff satisfied with teaching and learning facilities in polytechnic institutions?
- To what extent do students meet the entry requirements for HND programmes?

1.4 Objectives of the Study

The main objective is to assess the extent to which Polytechnics conform to standards of their regulatory bodies but the study specifically seeks to:

- Examine the extent to which Polytechnic institutions meet NCTE requirement of the qualification of teaching staff to handle HND programmes.
- Examine how students and staff are satisfied with teaching and learning facilities
- Determine the extent to which students meet the entry requirement of HND programmes

1.5 Scope of the Study

The study seeks to assess the extent to which quality is promoted in tertiary education in the country by examining the extent to which Polytechnic institutions conform to the standards of NCTE and NABPTEX. Polytechnics in Ghana run both non-tertiary and tertiary programmes but the study was limited to only HND programmes. This was chosen because when Polytechnics were elevated to tertiary status, they were mandated to produce the middle-level manpower for the nation by awarding HND certificates. The study investigated how quality is promoted in the areas of admissions, conduct of lectures, assessment and the adequacy of teaching and learning materials.

1.6 Justification of the Study

The reasons which underpin and justify the need for the study are as follows:

- There is a global concern about the quality of higher education (Materu 2006). This is because governments of various countries have realized the role of tertiary education in nation building. The PNDC Law 321 which elevated the Polytechnics to tertiary status had a central aim and objective of polytechnic education as training in career-oriented programmes which has more practical focus than the universities. Polytechnics have a primary mandate in the development of highly skilled manpower that is much needed in industry and the world of work. The question is, are Polytechnics matching educational outcomes to the needs of industry and the world of work?
- With the proliferation of tertiary institutions in recent times, there is public perception that educational quality is being compromised in the effort to expand enrolment. There is also growing complaints by employers that graduates are poorly prepared for the workplace (World Bank 2000). The Hon. Senior Minister, J. H Mensah has revealed that qualitatively many of the products of educational institutions are inadequately trained in the skills required by industry (Mensah, 2004).

  Although there are no reliable statistics, the Japan International Cooperation Agency (JICA) study (JICA 2001/2002) (Afeti et al 2003) shows that nearly thirty percent (30%) of recent polytechnic graduates are unable to find appropriate jobs in the domestic market one year after graduation and on completion of the national service. This problem has been attributed to the mismatch between human resource trained in the polytechnics and industrial

demands. The situation has accelerated by the decline in the economy over the years. Afeti (2005) has also revealed that inadequate practical skills and work experience of Polytechnic graduates is a cause of polytechnic graduate unemployment.

- Competition in the higher education market place has increased as a result of the numerous private and transnational providers who have entered the scene. A new range of competences such as adaptability, team work, communication skills and the motivation for continual learning have become critical. Thus polytechnic institutions are challenged to adjust their programmes, structures, curricula, teaching and learning methods to adapt to this new demand

From the above mentioned reasons, the study is justifiable on the grounds that stakeholders of polytechnic education will know whether or not they are conforming to standards. This will in turn enable them to adjust their programmes to ensure that they produce the requisite middle level manpower for the economic development of Ghana.

1.7 Organisation of the Study

The study has been organised into five chapters. Chapter one covers the study background which is made up of the introduction, problem statement, research questions and objectives of the study, scope of the study and justification of the study.

The second chapter encompasses the analysis of related research studies on quality in tertiary education across the world. It has been sectioned on quality concepts and types of quality assurance practices. The chapter looks at the arrangements put in

place by various entities to ensure quality in their respective organizations. A framework was designed from the literature to examine the extent to which the Polytechnics conform to the standards of their regulatory bodies.

Chapter three focuses on the research methods. It details out the research design, sampling procedure, sample size, data collection instruments and data analysis techniques. Chapter four deals with the analysis of data on student entry into polytechnics, facilities available for teaching and learning, qualification of teaching staff and assessment procedures .The final chapter explains and makes the summary of findings from the analysis in the fourth chapter clearer. The chapter also makes recommendations to improve quality of polytechnic education in Ghana.

CHAPTER TWO: POLYTECHNIC EDUCATION AND HUMANG RESOURCE TRAINING: UNDERSCORING QUALITY ISSUES.

2.1 Introduction

The rationale behind the review is to analyze issues on quality in higher education and to compare previous and existing research studies. This helps in identifying gaps in the literature, drawing valid conclusions from both supporting and opposing views and making reasonable decisions on good practices of ensuring quality of polytechnic education in Ghana. The chapter focuses on the analysis of related research studies on quality assurance in tertiary education across the world.

2.2 Polytechnic Education and Human Resource Training

There are 10 Polytechnics in Ghana, one in each regional capital. The Polytechnics were established to provide tertiary education through full time courses in the field of manufacturing, commerce, science, technology, applied social science and applied arts. The Polytechnics are regulated by the National Council for Tertiary Education (NCTE), the National Accreditation Board (NAB), and the National Board for Professional and Technician Examinations (NABPTEX). Polytechnics are mandated to run courses at the Higher National Diploma (HND) and degree levels. Non-tertiary programmes are offered as private tuition for people preparing for technical and vocational examinations.

Courses offered in the Polytechnics could be broadly categorised into two, namely engineering, applied science and technology, and applied social science and arts (Agodzo, 2007). About 5 (5.1) courses on the average are offered in the applied sciences and about 4 (3.6) in the applied arts in all the Polytechnics (Agodzo 2007).

The 2006 student enrolment and teaching staff strength stand at about 39,250 and 1,052 respectively with the staff student ratio averagely working out to about 1:37 for all the Polytechnics (NCTE, 2006). The national norm stands at 1:12 for the science based courses and 1:18 for the arts based courses averaging at 1:15 for all courses (NCTE 2006).

The Polytechnics are mandated to emphasize applied technology. This requires that programmes are designed to reflect the Competency Based Learning (CBL) policy objective of government. Agodzo, 2005 has defined CBL simply as 'do-it-yourself (DIY) learning. A graduate of the Polytechnic is expected to be well equipped for hands-on, practical work that is demonstrated in specific tasks he can do and must do. CBL moves education's focus from what academics believe graduates should know (teacher-focused) to what students need to know and be able to do in varying and complex situations (Student-focused/workplace focused).

Despite being embraced by some developed and developing countries, it is perceived by some people as wrong answer to improvement of education for the complex contemporary world and for sustainable development in the developing countries (Harris et al. 1995). A growing chorus of critics argues that the approach is conceptually confused, empirically flawed and inadequate for the needs of a learning society (Chappell, 1996). Studies in Britain, Australia, Canada and Singapore on CBL have revealed that it is crucial for labour market development for small-scale business and industry (Vrije Universiteit 2003).

The missing link in Ghana's development has been traced to the neglect of Technical, Vocational Education and Training (TVET) (Agodzo, 2007). Ghana has set up three

priority areas for development. This includes good governance, private sector development and human resource development through education and capacity building. This cannot achieve any meaningful results without paying attention to science, engineering and technology education at all levels. Therefore, TVET and CBL have been emphasized in recent education and development policy (Nsiah, 2007).

The curriculum development in Polytechnic institutions should therefore be such that a typical module in a course must have achievable targets. If achievable targets are set for a module, performance in delivery can be measured for each student. Curricular is expected to emphasize the delivery of specific tasks (Agodzo and Songsore, 2004). Teaching methodology must promote self-directed enquiry (Afeti, Baffour-Ewuah and Budu-Smith, 2003). For a successful CBL to develop talents, interests and skills (UNESCO/ILO, 2002) leading to an occupation in various sectors will depend on new approach to curriculum and teaching material development, reorientation of teaching staff, purpose staff recruitment and development, adequate supply of equipment and a framework for quality assurance (Agodzo, 2005).

2.3 Quality Issues in Polytechnic Education towards Human Resource Training

The key objective in the whole system of education reform is to make tertiary education more cost-effective and able to provide quality education for increasing numbers of students through increased efficiency in the utilisation of space, resources and personnel (NCTE, 1993). The provision of quality education is dependent largely on the availability of well motivated and qualified staff, relevant programmes,

educational materials (like books, journals, equipment, and consumables), lecture theatres, laboratories and workshops (TEP I, 1993).

2.3.1 Trends in Enrolments and Government Funding

With the implementation of the reforms, it is expected that enrolment will increase at all levels of education. A discussion on the trends in enrolment and government spending is relevant. Since 1993 when the Polytechnics were elevated to tertiary status, the total enrolment of students pursuing tertiary programmes was 1689 in 1993/94 academic year and 3634 in 1994/95, showing an increase in access of 1945 (115.2%). The total number shot up to 7316 in 1996/97 and 9,942 in 1997/98 (NCTE, 1993). The increases have been attributed to the institutions adding on more tertiary level courses and also the opening of Sunyani and Koforidua Polytechnics in 1996. One of the norms of NCTE requires that enrolment of women should make up 50% for all polytechnics but this objective is problematic, even though there has been some increase in some institutions. Enrolment rate in the polytechnics excluding Tamale and Ho increased from 10 – 15% in 1994/95 to between 14 and 25% in 1997/98 (NCTE, 2007). Enrolment of students at the tertiary level in general is dictated by the traditional belief that education, and particularly university education is good for national development (NCTE, 2007). As a result of this the available programmes in the university and polytechnics as well as student intakes into these programmes are driven by demand from parents and students instead of the labour market. According to Nsiah (2007), 'there is a mismatch between labour needs and educational outcomes in Ghana' and this has been attributed to inadequate dialogue between industry and the education sector, weak linkage of programmes with industry, lack of information on manpower needs etc. NCTE (2007) has revealed that admissions into the tertiary

institutions are not in response to the needs of the economy. This has resulted in either training more or less of either high level personnel or technician level personnel. It has further been unveiled by NCTE (2007), that Polytechnics are producing too many graduates in purchasing and supply as well as marketing even though a national ratio of 40:60 for science and business respectively has been instituted.

Polytechnics also run non-tertiary programmes. This implies that facilities and funding earmarked for tertiary programmes are actually applied to both tertiary and non-tertiary programmes. This has major implications for the utilisation of academic facilities.

Government funding for tertiary education has declined significantly in real terms (NCTE, 1993). Cost per student has not kept up with the rate of inflation. Cost per student doubled in the Universities between 1991/92 and 19997/98. This is much lower than the change in prices over the same period. In the case of the Polytechnics, nominal cost per student in cedis actually declined indicating a dramatic decline in real terms (NCTE, 1993). For the universities, the average cost per student was $2,360 in 1991/92, $1,081 in 1994/95 and had declined to $918 for 1997/98. For the Polytechnics, the average cost per student was $810 for 1993/94, $349 for 1994/95, and finally declined to $230 for 1997/98. The revelations support the views of Effah and Adu (1998) and Effah (2003) that polytechnics have not received the required level of funding.

2.3.2 Staffing

For quality of education to be maintained, there should be an adequate number of qualified staff who are properly remunerated. Staff at post are doing more than approved maximum teaching load (NCTE 1993). This does not provide them enough time to carry out research and extension, two equally important activities. The student-staff ratios in the polytechnics are generally higher than the norms, particularly in the management and business studies courses, except for the applied science courses where lower ratios were attained in 1996/97 (NCTE 1997). The staffing norms at the Polytechnics require distribution of instructors, lecturers and senior lecturers to be in the ratio 5:3:2 but the ratio as of 1996/97 academic year was 5:4.5:0.5 (NCTE 1997). Some Polytechnics are running programmes with staff who do not have the appropriate qualifications. This could be attributed to the fact that some of the polytechnics inherited teaching staff from the Ghana Education Service (GES) into the tertiary polytechnic system. Currently staff development is vigorously pursued by some polytechnics (Agodzo, 2007). Staff morale is low not only because of unattractive remuneration but also because of the lack of adequate accommodation facilities. Another reason for the low morale among polytechnic staff is the lack of funding to support research. NCTE (2007) has revealed that inadequate funding for research had severely constrained their abilities to do research works which in turn had affected their prospects for promotion.

2.3.3 Adequacy of Physical Facilities/Equipment, Books, Journals etc.

Almost all the tertiary institutions have benefited from the component of tertiary reforms that provided for an increase in physical facilities. In some institutions new buildings have not been provided but existing ones have been renovated (TEP I,

1993). The polytechnics are handicapped by not having adequate laboratories or workshops. Students are therefore sent to Kwame Nkrumah University for Science and Technology (KNUST) for practicals (NCTE, 2007). Ho Polytechnic for example, sends its students for two weeks each year for practicals at a cost of 6.8million cedis. Students from Sunyani Polytechnic are sent to KNUST 4-5 times a year for 3-5 days of practicals each time at a cost of 5 million cedis. Kumasi Polytechnic paid 12 million cedis to KNUST for the use of laboratory and workshop facilities during the 1996/97 academic year (NCTE, 2007). It would have been more cost-effective if a few of the polytechnics had been provided with well-equipped laboratories and workshops for their use. At Ho Polytechnic, the equipment provided did not meet their requirements. As a result of lack of consumables, none of the HND students in the faculty of Engineering has been able to do any welding (NCTE, 2007). The lack of adequate and appropriate infrastructure and equipment in the polytechnics has affected their programme delivery (NCTE, 2007). The problems of infrastructure relate to laboratories, libraries, workshops, classrooms, lecture theatres and staff offices. The civil works under the reforms provided mostly for rehabilitation of existing structures without giving much consideration to the fact that some of the existing structures in the polytechnics are not suitable for tertiary level work because they were originally constructed for second cycle education work (NCTE, 2007).

The lack of suitable and inadequate equipment in the polytechnics has been attributed to three main factors (TEP I, 1993). The first factor was the result of faulty needs assessment. The staff of GES who did the needs assessment were the craft and technician levels and were therefore not capable of identifying suitable equipment for tertiary level work. The second factor according to NCTE (2007) is 'the

unsatisfactory procurement arrangements. It is said that some inferior equipment was delivered. The third factor was the long delay in completing rehabilitation works in the laboratories and workshops. As a result some institutions that had taken delivery of equipment could not have them installed (NCTE, 2007).

2.3.4 Instituting a framework of Quality Assurance

According to Agodzo (2007), 'the Polytechnics have also been pre-occupied with maintaining credibility in the delivery of tertiary education by gradually putting in place structures that will not compromise the quality of service delivery across the full spectrum of teaching and examination'. Staff and student appraisal have been put in place by some polytechnics to those who are not performing to standards are made to perform their task to satisfaction. The institutions are expected to establish minimum admission requirement, undertake internal assessment for the approval of new programmes, see to the employment of the right calibre of staff, ensure the maintenance of the carrying capacity of the institution and take feedback from former students and their employment among other things (Okordjie, 2009). They have external responsibilities as well. The roles played by the Academic Quality Assurance Units (AQAU) cannot be overemphasised as far as quality issues are concerned but do all polytechnics have AQAUs? And to what extent are they functioning in the various polytechnic institutions?

NAPTEX has been mandated to coordinate polytechnic examinations but they also depend largely on the universities to moderate examination questions of the Polytechnics (NCTE, 2007).

2.3.5 Industrial Attachment

Industrial attachment is an essential component of CBL. As such it is vigorously pursued by all polytechnics to make their courses of practical relevance to industry. The question is whether industrial attachment has relevance to industry is a matter of concern. According to Agodzo and Songsore (2004), 'students of polytechnic are left to fend for themselves when it comes to industrial attachment and one would be lucky to get placement, and if one does, whether such placement is of relevance to the programme being pursued at all'. It has been revealed that the Industrial Liaison Office mandated to oversee the activities of industrial attachment in the polytechnics is not doing much with respect to placement. The cost of ensuring that students are properly placed and supervised is usually high probably that explains the problems of industrial attachment (Agodzo and Songsore, 2004).

2.4 Quality Assurance in Higher Education

Quality assurance is a planned and a systematic review process of an institution or programme to determine whether or not acceptable standards of education, scholarship and infrastructure are being met, maintained and enhanced (Mukhopadhay 2005). According to the World Bank (2000), structured national level quality assurance in Africa higher education is a very recent phenomenon and that most countries face major capacity constraints. Rapid growth in enrolment amidst declining budgets during the 1980s and 1990s, the proliferation of the private sector in the provision of higher education and pressure from rapidly transforming labour market has combined to raise new concerns about quality. Countries are becoming conscious of the need for effective quality assurance and quality improvement (World Bank, 2000).

According to the World Bank (2000), senior officials from Madagascar, Ethiopia, South Africa and Nigeria expressed concern about the need to improve quality of tertiary institution, the need to reassure the public about the quality of private providers and the importance of ensuring that tertiary education offered in both public and private tertiary institutions meet acceptable local and international standards.

Existing quality assurance agencies are young, the majority being established within the last 10 years. Currently 16 countries have functional quality assurance agencies. The emergence of private tertiary institutions and the need to regulate their activities appears to have been the main trigger for the establishment of formal quality assurance agencies in most countries. Several countries according to the World Bank Paper No. 124 have changed their laws to make accreditations of public tertiary institutions mandatory. National agencies of Ethiopia, Ghana, Mauritius, Nigeria, South Africa, Tanzania and Uganda amended their laws in 2005 to extend the mandate to public universities while Ethiopia's mandate included all types of higher education institutes right from its inception in 2003. The World Bank Paper showed that Mozambique and Madagascar were also developing their systems aiming at similar approach.

There is convergence in methodologies across countries in maintaining quality of programmes and activities of tertiary education. Some institutions have adopted the International Standard Office (ISO) approach in some of their activities. Depending on the definition selected, quality implies a relative measure of inputs, processes, output or learning outcomes. For this research, quality would be referred to as 'fitness for purpose', i.e. meeting or conforming to generally accepted standards as defined by an institution, quality assurance bodies and appropriate academic and professional

communities. Standards can be defined in terms of a minimum 'threshold by which performance is judged' (Ashcroft & Foreman-Pack, 1996, p. 21). In this context quality is assessment in terms of a set of norm-referenced standards that are built around what is expected at the minimum and beyond. In the diverse arena of quality in tertiary institutions include their vision and goals, the talents and expertise of the teaching staff, admission and assessment standards, the teaching and learning environment, the employability of its graduates (relevance to the labour market), the quality of the library and laboratories, management effectiveness, governance and leadership (Southern Africa Universities and Colleges Association (SAUVCA) 2002).

2.4.1 Quality Dimensions in Tertiary Education

Quality was originally developed in the manufacturing industry. In the area of higher education, the adoption of quality control has been superficial and diluted by the exercise of academic freedom (Largosen, et al, 2004). Further the prevailing culture of universities is often based on individual autonomy, which is zealously guarded (Colling & Harvey, 1995). Thus it is usually difficult to apply the features of quality to higher education considering the fact that quality requires team work (Boaden and Dale, 1992). In Ghanaian polytechnics for instance until the intervention of NABPTEX, polytechnics had different academic calenders, determined by the Academic Boards. This made it impossible to administer common examinations questions. The teachers set the questions and mark their scripts as well, yet all students receive the same certificates. This implies that standards could not be the same across the polytechnics. There was therefore the need to bring uniformity in the conduct of the examinations in order to ensure equal standards of test items. Quality of higher education is very important to its stakeholders; providers (funding bodies

and community at large), students, staff and employers of graduates are important (Srikanthan and Darlrymple, 2003). Quality has been identified from the perspective of three dimensions namely, product, software and service dimensions.

Garvin (1987) proposed the following dimensions for quality that, as he stated, can define both products and service quality. These are performance, features, reliability, conformance, durability and serviceability. Performance is concerned with the primary operating characteristics of a product. Features are the characteristics that supplement the basic performance functions. The probability of a product working fault free within specified time period could be reliability. Conformance of a product is the extent to which a product meets the established specifications or standards. The product assumed life to perform satisfactorily is durability. Serviceability is concerned with the repair and field service of a product. The characteristics of a software as an intangible products are more consistent with higher education. Watts (1987) identified the main components of quality used in software engineering as correctness, reliability, efficiency, integrity, usability, maintainability, testability, expandability, portability, reusability and interoperability. The service dimension to quality is probably more akin to the educational process. In higher education, the framework is more applicable to teaching and learning because they are more like a service. Parasuraman et al (1985 p.9) identified the following dimensions of quality; reliability, responsiveness, competence, access, communication, credibility, security, understanding and tangibles.

The dimensions have implications for higher education. Owlia and Aspinwall (1996) based on review of the dimensions of quality deduced and presented comprehensive interpretations of six components for higher education. The six criteria are tangibles, competence, attitude, content, reliability and delivery, The dimensions are indicative of the areas that should be of concern to ensure quality in higher education. The criteria (indicators of quality in higher education) have been explained as follow:

- Tangibles as a criterion for measuring quality in higher education is characterized by availability of workshops and laboratories stocked with modern and sufficient equipment and tools. Very good ICT centres with working computers connected to the internet.
- The competence of an institution as a means of assessing quality of higher education consists of the number of qualified staff (academic), enrolment, student-teacher ratio, teaching expertise etc. of an institution
- The attitude of teaching staff focuses on how regular and punctual teachers and students are to classes, understanding the needs of students and giving personal attention to students.
- Content refers to the relevance of course and course content to future profession, practical training, industrial attachment, syllabi and times of review, whether course content is up to date etc.
- Delivery as a criterion is composed of good teaching methods and effective presentations, fairness of examinations and continuous assessment and programme accreditation. Finally the ability of higher education to award its students with credible certificates fall under reliability.

2.5 Conceptual Framework

A framework was developed around these dimensions to assess conformity to standards by polytechnic institutions. The model in figure 2.1 helps to identify the different facets and influences of the indicators under investigation. It also shows the level one could go to analyze the issues with the view of presenting a holistic picture for workable recommendations. The polytechnic education system like any educational system exhibits the behaviour of an open system, which has an environment that inputs some form of energy to the system, which undergoes transformation to give some outputs into the environment. According to Mukhopadhay (2005) every society has certain implicit or status indicators of educational inputs, process and output. These indicators for the provision of quality form an interrelated system as shown in figure 2.1. The extent to which institutions conform to standards at each stage is analysed.

2.5.1 Input-Output Analysis of Polytechnic Education.

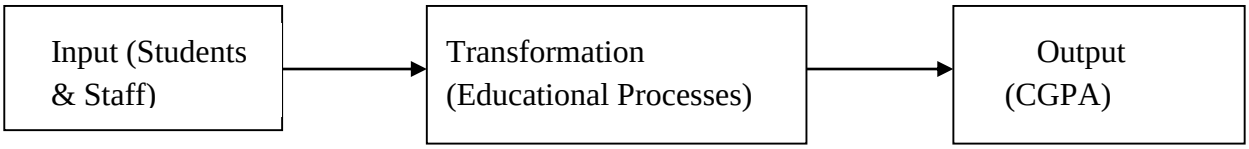
Tertiary education system consists of the input stage, transformation or process stage and the output stage.

As an open system, it is highly dependent on the environment. The inputs to the system are the human resources in terms of students and lecturers. Students as inputs are looked with respect to their mode of entry to pursue HND programmes, whether they entered with SSCE/WASSCE, ACCESS, non tertiary certificates such as the Electrical Engineering Technician (EET), Mechanical Engineering Technician (MET), Fashion Advance, Catering Advance etc. or through mature entrance. The aggregates with which students entered the polytechnics formed part of the input

analysis. These helped in the assessment of the quality of the input in terms of academic performance. The qualifications with which lecturers are employed whether or not they conform to standards also determine the quality of inputs.

The educational processes and activities related to the curriculum, management and support mechanism form the transformation system. From figure 2.1, the transformation stage is where information is sought on the tangibles (such as workshops and laboratories, tools and equipment etc.), competence (qualified staff, enrolment etc.), attitude (counselling services), content (relevance of curriculum), delivery (teaching methods, presentations), and reliability (giving awards). Information on these is analyzed to find out whether or not standards are maintained. The output stage is limited to final results of the employable graduates. It focuses on the credibility of certificates based on the nature of the transformation stage. The achievement of the polytechnics is sought for at this stage depending on the extent to which the institutions conform to the standards at each level of the model.

Figure 2.1 Input-Output Process of Polytechnic Education as an Integrated System.



CHAPTER THREE: RESEARCH METHODOLOGY

3. Introduction

This chapter presents the methodological processes and procedures employed in the conduct of the research.

3.1 Research Design

The research was descriptive employing the sample survey design as a data collection technique. It analyzed the quality of Higher National Diploma (HND) programmes pursued by polytechnics in Ghana. This was done in three perspectives: the input (quality of student entry grades and quality of staff); processes (availability of teaching and learning facilities, the quality of examination process, regularity and punctuality of lecturers, teaching methods, industrial attachment etc.) and output (student Cumulative Grade Point Averages and achievement of polytechnic institutions based on the input and transformation stages). Data in respect of these variables were collected using the sample survey design (self-administered questionnaire and interview) involving opinions of students, teaching staff, and management of the polytechnics.

3.1.1 Sampling Procedure and Sample size.

The study employed both probability and non-probability sampling techniques to select the respondents. Probability sampling is a sampling technique wherein the samples are gathered in a process that gives all the individuals in the population equal chances of being selected. This technique has the advantage of avoiding or reducing sampling bias (the difference between results from the sample and the population).

Non probability sampling does not represent random selection. The probability sampling techniques included the simple random and cluster sampling while the non-probability sampling techniques were quota and accidental sampling. Simple random sampling ensures that all the members of the population are included in the list and the desired number of subjects is randomly selected. In cluster sampling the researcher identifies boundaries and puts the population into clusters and then selects randomly from the clusters. With accidental (convenience) sampling, the sample is chosen with a purpose in mind while selecting non-randomly according to some fixed quota is quota sampling. The sampling process was done in four stages: selection of polytechnics, schools, departments and respondents.

The sampling process began with the selection of polytechnics. In this respect, the polytechnics were grouped into two; old polytechnics (those that were established before 1993) and new polytechnics (those polytechnics that were established in 1993 and beyond). The polytechnics were clustered on this basis because the researcher assumed that the old ones had some established facilities that only came into existence in the new ones following the elevation of the polytechnics to tertiary status in 1993. There are six old and four new polytechnics in Ghana. Owing to challenges of time and funds, it was impossible to involve all 10 polytechnics in the study. As such, five polytechnics were chosen out of the 10 using quota sampling. This technique was done using a ratio of 3:2 to reflect the number asymmetry between the old and new polytechnics. In this respect, three polytechnics were chosen from the old ones while two polytechnics were selected from the new ones using simple random sampling.

The next stage in the sampling process involved the selection of schools in the selected polytechnics. The study intended to involve all schools in each polytechnic. However, not all polytechnics have equal number of schools. As such, three schools in each polytechnic were selected to ensure that all of them had equal representation in the sample (The minimum number of schools in the polytechnics was three). In polytechnics that had a maximum of three schools, all the schools were included in the study. However, the simple random sampling technique was used in selecting three schools in polytechnics with more than three schools. In all, fifteen schools were selected for the study.

The departments were selected using the simple random sampling to choose one department from each school. This was done on the assumption of homogeneity in the nature of courses ran in each school. Thus, one department in each school is assumed to adequately represent the whole school in respect of the experiences of students and teachers. This technique of sampling is representative of the population but could be biased when random sampling procedures are not followed right. In this regard, fifteen departments (one from each school) were selected for the study.

Finally, the selection of the respondents was done by, first of all, clustering them into three groups; (1) students, (2) teaching staff and (3) and key respondents (heads of Examinations, Liaison, Admissions and Quality Assurance Units). The students were selected using the accidental sampling technique. Ten (10) level 200 or level 300 students were conveniently chosen from each department. The Levels 200 and 300 students were chosen for selection because they have gained appreciable experiences in their various courses of study. Also, the rather small samples of ten students were

selected because of the homogeneity of experiences among the students in each department. In all, 150 students were selected for the study.

Five teaching staffs in each selected department were chosen for the study using the accidental sampling technique. This technique was used because it could not have been possible to meet all staffs for their responses although a sampling frame could be made of them. Secondly, five lecturers from each department were arbitrarily selected because the lecturers share similar knowledge and experiences about the department's operations and facilities. A total of 75 lecturers were chosen for the study.

Finally, the key respondents were selected using purposive sampling. This technique was used because it was expected that they have the requisite information needed for the study. Consequently, fifteen key respondents were selected from the five selected polytechnics involving five examinations, five Admissions and five Quality Assurance Officers.

In all a total sample of two hundred and forty was used for the study. This consists of 150 students, 75 teaching staff and 15 key respondents.

3.1.2 Data Collection Instruments

Two sets of structured questionnaires were designed for the students and teaching staff. The questionnaire was used for the students and lecturers because it was convenient in allowing them to provide responses independently. It was also quicker to obtain data from such a large sample (number of respondents) using the questionnaire. For the teaching staff, this method was even more imperative with regard to the difficulty in meeting them for responses due to their busy schedules. For the key respondents, a set of interview schedule was designed. The interview technique was used for this category of respondents because of their relatively small size and, also, it allowed for further explanations of their responses.

The questions to the teaching staffs generally sought their views on the availability and adequacy of workshop and laboratory equipment and other instructional materials. It also demanded from them the challenges they face in the course of executing their duties, the relevance of industrial attachment and the roles of Academic Quality Assurance Unit (AQAU). Questions to the students sought to solicit their views on the relevance of course content to their career, teaching methods of lecturers, how regular and punctual lecturers are to class etc. It sought to inquire whether students are satisfied with what they received from lecturers. Basically questions to the key respondents sought to inquire whether students have acquired the requisite knowledge and skills for the job market.

The research instruments were pretested at the Engineering Department of Takoradi Polytechnic to ensure they yielded the expected responses and to eliminate all ambiguous and unnecessary questions.

3.1.3 Data Analysis Techniques

This involved descriptive and some quantitative analysis. The data collected by the use of the various instruments were thoroughly edited and checked for completeness and comprehensibility. The edited data were summarized and coded for easy classification in order to facilitate tabulation. The tabulated data were analyzed by calculating various percentages where possible. Descriptive statistics especially, frequencies and cross tabulation were applied to establish patterns, trends and relationships and to make it easier for the researcher to understand and interpret implications of the study. Presentation of data was in the form of tables, pie-charts and bar graphs only where it provided interpretation of the findings.

CHAPTER FOUR: CONFORMITY TO NCTE AND NABPTEX STANDARDS BY POLYTECHNIC INSTITUTIONS

4.0 Overview of the Chapter

The chapter discusses the results of the questionnaire and interviews responded by participants. It analyses data on the inputs of polytechnic education, the processes through which the inputs are taken through to produce quality outputs. It examines the extent to which polytechnic institutions conform to standards of NCTE and NABPTEX in respect of admissions, teaching and learning and assessment of student.

4.1 Some NCTE Standards for Polytechnic Education

The norms for the polytechnics cover staff and resource allocation (NCTE, 2006). The staff norm for the polytechnics cover the staff mix in a department, student/teacher ratios (STR), numbers and types of teaching support staff and the number and types of staff required for non-academic departments. The staff mix in a particular department consists of the teaching staff (these are made up of Lecturer grades which require higher degrees and instructor grades which can be entered with a first degree. The teaching staff mix for all departments has been determined as follows:

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

The criteria for determining student/teacher ratios for polytechnics are;

- Emphasis on practical training for students demanding greater supervision at the workshops and laboratories for such curses as engineering, catering, secretaryship etc.
- The ability of the teacher to handle many students will depend on the number of hours a student must spend at the laboratory/workshop and the level of attention the lecturer must give to each student.
- Polytechnic lecturers are to do research as well as provide some service to community for their promotion just as obtains in the universities. The number of students therefore should be of a size that will permit him to have time for his other duties.

The following ratios have been given considering the foregoing criteria (NCTE, 2006).

I.	Engineering	12:1
II.	Statistics	20:1
III.	Laboratory Technician Course	15:1
IV.	Computer	15:1
V.	Catering	12:1
VI.	Fashion and Design	15:1
VII.	Secretaryship	15:1
VIII.	Accounting	15:1
IX.	Marketing	20:1
X.	Purchasing and Supply	24:1
XI.	Liberal and General Studies	24:1

Teaching Support Staff Ratio	Science Based Dept.	Business & Arts
• Administrative	1:10 teachers	1:10 teachers
• Senior Technical	1:5 teachers	1:10 teachers
• Junior Technical	1:3 teachers	1: 5 teachers
• Junior Non-Technical	1: 10 teachers	1:10 teachers

4.2 Students Entry to Pursue HND Programmes

The NCTE accepts a minimum completion of secondary education in order to pursue tertiary programmes. In the polytechnics, entry to pursue HND programmes demands that one might have had the requisite passes that satisfy general requirements for admissions and cut-off points for various departments. Students gained admissions with passes in the Senior Secondary Certificate Examinations (SSCE), West African Senior Secondary Certificate Examination (WASSCE), Diploma in Business Studies (DBS), Advance Business Certificate Examination (ABCE), Electrical Engineering Technician III (EET III), Mechanical Engineering Technician III (MET III), Fashion Advance, Advance Catering etc. Access Courses for the sciences and technicians organized by NABPTEX and Mature entry.

Students' entry to pursue HND programmes was looked upon in terms of mode of entry, students' entry aggregate, whether admitted students met general requirement and duly satisfied departmental cut-off points.

Table 4.1 Mode of Entry to Pursue HND Programmes

EXAMINATION TYPE	MALE	FEMALE	FREQUENCY	PERCENTAGE
SSSCE/WASSCE	45	30	75	50.00
GCE 'A' LEVEL	8	2	10	6.67
ACCESS	30	15	45	30.00
MATURE	8	12	20	13.33
TOTAL	91	59	150	100.00

Source: Authors Construct, July 2011

Table 4.1 shows one hundred and fifty (150) students of polytechnic institutions who had gained admissions and are pursuing HND programmes. All students have acquired secondary education and therefore satisfy NCTE basic requirement. Of the 150 students, 75 of them which represent 50 percent were admitted with SSSCE/WASSCE. Out of the 75 WASSCE/SSCE applicants, 45 are males and 30 are females. This constituted the highest mode of entry to HND programmes. This was followed by Access with 30 percent and Mature entry examinations with 13.33 percent. The least mode of entry was GCE A level with only 6.67 percent. Some of the students who gained admissions through mature entrance examinations were holders of SSCE/WASSCE and GCE A level certificates but entered as mature students probably because they had weak passes or were over aged (above 24 years of age). Some also claimed that mature mode of entry is relatively flexible. Some mature applicants were below the age of 20 years and had no working experience yet entered through this mode because of the flexibility associated with this mode of entry. The quality of entry by this mode is at stake because Parasuraman et al (1985) perceived

reliability as a dimension of service quality as a way the service is carried out in a way it is promised.

Of the 150 students who had gained admissions to pursue HND programmes, 82 students which represent 54.67 percent entered with aggregates ranging from 21 to 29. This category constituted the highest number of students. This was followed by students with aggregates 30 – 36 which represents 26.67 percent. Twenty-five (25) students' equivalent of 16.66 percent entered with aggregates 16 – 20 while two (2) students entered with aggregates above 36. This means that the two students did not satisfy the general entry requirement but might have entered probably through the access programme. Only one student entered with an aggregate of below 16. The information is illustrated in Table 4.2.

TABLE 4.2 Students Entry Grades to HND Programmes

AGGREGATE	MALE	FEMALE	FREQUENCY	PERCENTAGE
BELOW 16	1	0	1	0.67
16 - 20	18	7	25	16.66
21 - 29	56	26	82	54.67
30 - 36	14	26	40	26.67
ABOVE 36	0	2	2	1.33
TOTAL	89	61	150	100.00

Source: Authors Construct, July 2011

The information suggests that majority of the students that is 122 out of 150 which represents 81.33 percent entered with aggregates of between 21 and 36. This presupposes that the input with respect to student entry grades is not too encouraging as compared to that of the entry grades for other tertiary institutions. Likewise the students were asked whether they would have preferred university education if they had had the opportunity. The report shows 90 percent responding in the affirmative. Only fifteen (15) out of the 150 students an equivalent of only 10 percent stated that they entered polytechnic because they needed polytechnic education. The information is illustrated in table 4.3

Table 4.3 Students Preference of University Education to Polytechnic Education

RESPONSE	FREQUENCY	PERCENTAGE
YES	135	90
NO	15	10
TOTAL	150	100

Source: Authors Construct, July 2011

The views of the students as regards university preference to polytechnic education are not different from the key respondents' i.e. management of polytechnic institution. Eight (8) out of the 15 key respondents (53.33 percent) were of the view that polytechnic students preferred university education to polytechnic education and would have entered university if they had satisfied university requirements. However 26.67 percent on the other hand opposed the notion of students' preference of polytechnic education to university and stated that polytechnic students entered polytechnic because they needed polytechnic education. Three (3) out of the 15 were not sure whether polytechnic students preferred university to polytechnic education. This is illustrated in table 4.4

4.4 Key Respondents Views on Students Preference of Polytechnic Education to University Education

RESPONSE	FREQUENCY	PERCENTAGE
YES	8	53.33
NO	4	26.67
NOT SURE	3	20.00
TOTAL	15	100

Source: Authors Construct, July 2011

From the point of view of both students and management it is clear that students' preference of university education to polytechnic constitutes the majority and most students would have entered university if they had satisfied university requirements. This again suggests that students entering polytechnics (input) have relatively weaker grades.

Table 4.5 Cut-Off Points for Admissions to HND Programmes.

RESPONSE	FREQUENCY	PERCENTAGE
YES	10	66.67
NO	3	20.00
NOT SURE	2	13.33
TOTAL	15	100

Source: Author's Field Survey, July 2011

On the issue of cut-off points for admissions to HND programs, all departments agreed on the use of cut-off points which varies from year to year. According to them, it could be raised or lowered depending on demand for the programmes and availability of facilities. When the key respondents were questioned on whether all

admitted students met the cut off points, diverse views were put forward. This is shown in table 4.5. The question was asked to understand further, the quality of the inputs. From the table, 66.67 percent were of the view that all admitted students met cut-off points of departments. They explained that admissions are centralized and management ensures standards during admissions. However 20 percent believed that not all students met the cut-off points because some might have gained 'protocol' admissions due to social networks and personal skills such as good sportsmen and women.

Again the key respondents were asked further, whether they have ever assisted students in gaining admissions. This question is important to ascertain whether management maintains their position on strict adherence to cut-off points during admissions. The outcome is shown in table 4.6

Table 4.6 Admission Assistance to Students and Students Meeting Cut-Off Points

OUTCOME	MALE	FEMALE	TOTAL	PERCENTAGE
YES	8	3	11	73.33
NO	1	3	4	26.67
MET CUT-OFF (YES)	4	2	6	54.54
MET CUT-OFF (NO)	4	1	5	45.46

Source: Author's Construct, July 2011

From table 4.6, 11 out of 15 respondents which represent 73.33 percent agreed that they have assisted some students to gain admissions while 26.67 percent of the 15 key respondents stated that they have not assisted any student to gain admission. Among those who have assisted students to gain admissions, 8 are males and 3 are females. Six out of the 11 key respondents who have assisted some students to gain admissions stated that those students they assisted actually satisfied the cut-off points of various

departments. About 45.46 percent of respondents who have ever assisted some students to gain admissions agreed that those they assisted did not meet the cut-off points of the programmes they applied for, even though they satisfied the basic requirements for admissions.

This revelation underpins the fact that generally, the input with respect to students' entry grades is weak even though all students met the general requirement for admissions and therefore satisfied NCTE requirement.

4.2.1 Qualification of Teaching Staff of Polytechnics

On the part of the quality of lecturers of polytechnics, secondary data collected from the chosen polytechnics on academic qualification have been presented in table 4.7

Table 4.7 Qualifications of Teaching Staff of Polytechnics

QUALIFICATION	FULL TIME			PART TIME		
	MALE	FEM.	TOTAL	MALE	FEM.	TOTAL
PHD	4	2	6	12	0	12
MPHIL	19	11	30	21	5	26
MSC/MA/MBA/PR	382	164	546	13	5	18
BSC/BA/BED/PR	493	187	680	11	14	25
HND/TECH/OTHER	47	18	65	-	-	-
TOTAL	945	382	1327	57	24	81

***So**urce: Planning Units of Selected Polytechnics July 2011*

The National Council for Tertiary Education admits that newly recruited teaching staff to handle HND programmes should have a minimum qualification of a second degree. NCTE however did not specify whether the degree should be a Master of

Science (MSC), Master of Arts (MA) or Master of Philosophy (MPHIL). Information gathered from the key respondents revealed that any of the Master degrees is acceptable but MPHIL is preferred. From table 4.7, 18 of the teaching staff are PHD holders, 56 with MPHIL, 65 HND holders, Technicians and other qualifications within the same category, 564 Masters Degree (MA/MSc/Prof) holders and 705 first degree holders. Out of a total of 1327 full time teaching staff, 582 representing 43.8 percent were second and higher degree holders and therefore satisfied NCTE requirements. Seven hundred and forty-five (745) which represents 56.2 percent were first degree holders and others. According to Management of the selected polytechnics, the presence of first degree holders is as a result of lack of qualified personnel to handle specific courses. It could also be attributed to the fact that they were tutors before the implementation of the HND. Management of polytechnic institutions has mentioned that, all first degree holders have been given up to close of 2012 to upgrade themselves and institutions have stopped employing first degree holders. It was also revealed that majority of the first degree holders have been enrolled unto second degree programmes on scholarships. Some of them have also completed the 'taught' aspect of their programmes.

Out of a total of 18 PHD holders, 33.33 percent are full time; the remaining 66.66 percent are part-time. For MPHIL holders 26 out of 56 which represent 46.43 percent are not full time. For the 638 teaching staff who satisfies NCTE requirements in terms of qualifications, 8.78 percent are part-time lecturers.

4.2.2 Ranks of Polytechnic Teaching Staff

NCTE has again emphasized that 20 percent of the teaching staff of polytechnics should be principal and senior lecturers, 50 percent lecturers and principal instructors and 30 percent senior instructors and instructors. From table 4.8, of a total of 1327 teaching staff, principal lecturers were only 2 while senior lecturers were 21. The percentage of principal lecturers to the total teaching staff was 0.15 percent while that of senior lecturers was 1.58 percent. The percentage of both principal and senior lecturers was 1.73 percent, a variance of about 18 percentage points with the standard set by NCTE (20 percent). The percentage of lecturers and assistant lecturers was 42.13 percent while that of principal instructors was 41.0 percent. The percentage of both lecturers and principal instructors was 82.5 percent. This was higher than the NCTE requirement of 50 percent. The relatively high percentage points scored by this category could be attributed to the fact that only second degree holders are currently employed to teach. It may also be attributed to the fact that the first degree holders and technicians who were teaching before the introduction of HND have upgraded and have risen through the ranks. NCTE requires 30 percent of teaching staff to be in the rank of senior instructors and instructors but the category constituted 12.81 percent, a variance of 17.19 percent.

Table 4.8 Ranks of Polytechnics Teaching Staff

RANK	MALE	FEMALE	TOTAL
PRINCIPAL LECTURERS	2	0	2
SENIOR LECTURERS	18	3	21
LECTURERS.	510	37	547
ASSISTANT LECTURERS	4	8	12
PRINCIPAL INSTRUCTORS	427	109	536
SNR INSTRUCTORS	64	9	73
INSTRUCTORS	70	27	97
ASSISTANT INSTRUCTORS	19	20	39
TOTAL	1114	213	1327

Source: Planning Units of Selected Polytechnics, July 2011

4.3 Enrolment in Polytechnic Institutions

Enrolments in polytechnic institutions have increased substantially over the years. The increase in enrolment has significantly been in business related programmes and not in science and technology programmes. In 1996/97 academic year the enrolment in science was 4057 and that of business was 3363 indicating a ratio of 60: 40. The ratio reduced to 55:45 in 2000/2001 and further reduced to 41: 59 in the 2003/2004 academic year. The information is shown in table 4.9

Table 4.9 Enrolments in Science/Technology and Business Related Programmes

Academic Year	Science/Technology	Business Related Programmes	Ratio
1996/1997	4057	3363	60:40
2000/2001	8161	10289	55:45
2003//2004	9908	14445	41:59

Source: National Council for Tertiary Education (NCTE) Statistical Digests June 2005.

In the five selected schools the 2010/2011 academic year, enrolments in science and business programmes is not different from the previous years. In all the institutions, the number of students in business related programmes is greater than the number of students in the science programmes. The information is shown in table 4.10.

Table 4.10 Enrolments in Science/Technology and Business Related Programmes and Teaching Staff of Polytechnics.

INSTITUTION	BUSINESS PROGRAMMES			SCIENCE/TECHNOLOGY PROGRAMMES		
	ENROLMENT	TEACHERS	RATIO	ENROLMENT	TEACHERS	RATIO
1	3600	42	1:86	2120	30	1:71
2	2720	35	1:78	1372	26	1:53
3	4725	60	1:79	1910	33	1:58
4	3920	65	1:60	2572	40	1:64
5	6825	75	1:91	3412	42	1:81
TOTAL	21790	277	1:79	11386	171	1:67

Source: Planning Units of Selected Polytechnics, July 2011

Table 4.1 shows the number of registered regular students and teaching staff of business and science programmes of selected polytechnics. From the table, the enrolment in business related programmes is greater than that of science and technology programmes for all five polytechnics, the ratio of science to business enrolment for school 1 is about 0.67: 1 but NCTE approves a ratio of 1.5:1. Again the teacher-student ratios are 1:79 and 1:67 for business and science respectively. These ratios do not meet standards set by NCTE which puts teacher-student ratio for engineering courses at 1:12, applied sciences at 1:15 and business programmes at 1:20. In each school, Management admitted their inabilities to meet standards and blamed government for inadequate infrastructural expansion. The views of Management of polytechnic institutions support the views of NCTE (1996/1997) which attributed the non attainment of norms to inadequate facilities and insufficient qualified science and mathematics teachers. The 2006 student enrolment and teaching

staff strength stood at about 39250 and1052 respectively with a staff-student ratio averagely working out to about 1:37 for all polytechnics (Agodzo, 2007). This ratio has shot up considerably to about 1:73 in 2011 deviating considerably from the NCTE standard. In view of Garvin's (1988) perception of quality, which sees it as conformance to requirements and specifications, the quality of teaching staff is a matter of concern.

The nature of teacher-student ratio is as a result of a general increase in enrolment in the polytechnics. This could be attributed to increased access to tertiary education in the world in general. Available statistics indicates that students' enrolment globally is on the increase; from 13 million in 1960 to approximately 139 million in 2005. This represents 24 percent increase in this period. In the same period enrolment in Sub-Saharan Africa grew by 5 percent (NCTE, 2006).

Large class size can negatively affect two significant and interrelated aspects of teacher practice – instructional time and classroom management. According to Holloway (2002) teachers in smaller classes are more likely to cover a range of subjects. Large classes take a toll on the teacher's ability to manage time, requiring more time to be devoted to instructions (i.e., how to complete an exercise rather than substantive instruction), task management and behavioral management, thus leaving less time for actual instruction (Wilson 2006; Holloway, 2002).

Class size also impact teacher motivation and job satisfaction. Finn et al (2003) constructed a conceptual model that considers the impact of class size on teachers' morale and enjoyment of their profession, which in turn impacts students'

engagement. He refers a ‘sense of community’ that can exist within a classroom and suggests that smaller classes positively impact teacher and student motivation.

Finn et al (2003) also reviewed studies that examined the link between student engagement and class size and concluded that when students are placed in smaller classes they become more engaged, both academically and socially. With strong social and academic engagement, he argues, academic achievement increases.

When Management of selected institutions was inquired about the mechanisms put in place to ensure quality in spite of challenges, they said they would continue to admit the number of students that would enhance effective teaching and learning. Again for a large class size, the class is divided into two or more classes. This puts the teacher-student ratio to about 1:35 or better to promote effective teaching and learning. This strategy also increases the lecturer’s contact hours for example, where there is one lecturer for a particular course. For inadequate classrooms, classes begin early in the mornings and ends late in the night.

4.4 Adequacies of Teaching and Learning Facilities

Information was sought on the extent to which Management of polytechnic institutions, teaching staff and students are satisfied with teaching and learning facilities in their institutions. The outcome is shown in table 4.11.

Table 4.11 Adequacies of Teaching and Learning Facilities

ITEM	FREQUENCY	PERCENTAGE
VERY ADEQUATE	3	20
ADEQUATE	2	13.33
NOT VERY ADEQUATE	9	60
INADEQUATE	1	6.67
TOTAL	15	100

Source: Author's Field Survey, July 2011

The adequacy of teaching and learning facilities which include workshops, equipment, classrooms, space, library, ICT etc. referred to as tangibles by Owlia and Aspinwall (1996) play a crucial role in the refining process of polytechnic inputs. In the CCTA colloquium monograph 2007, Fabian Belieb cited that inadequate and inappropriate teaching and learning materials in Ghanaian schools could be attributed to the fall of educational standards. In the polytechnics in Ghana about 60 percent of management was of the view that academic facilities on campuses are not very adequate. While twenty 20 percent believed that available facilities are very adequate, 13.33 percent thought that academic facilities are adequate. However one (1) out of 15 which represents 6.67 percent was of the view that academic facilities in general are inadequate.

The opinions of both lecturers and students were also sought to ascertain the true picture of the adequacy of school facilities in their institutions. The outcome revealed that of the 150 students interviewed, 98 of them (65.33 percent) supported the idea

that polytechnic facilities are not very adequate. Fifty-two of them shared the idea that the facilities are inadequate. Among the lecturers about 57 percent supported the notion that academic facilities are not very adequate while about 43 percent thought that facilities are inadequate. The views of both lecturers and students were in agreement with 60 percent of management's views that academic facilities are not very adequate and suggest that students, lecturers and management of polytechnic institutions are not satisfied with the adequacy of school facilities. The views of students and lecturers are illustrated in table 4.12

Table 4.12 Students and Lecturers Views on the Adequacy of School Facilities

VARIABLES	ADEQUATE YES	ADEQUATE NO	PERCENTAGE YES	PERCENTAGE NO
STUDENTS	52	98	34.67	65.33
LECTURERS	32	43	42.67	57.33

Source: Author's Construct, July 2011

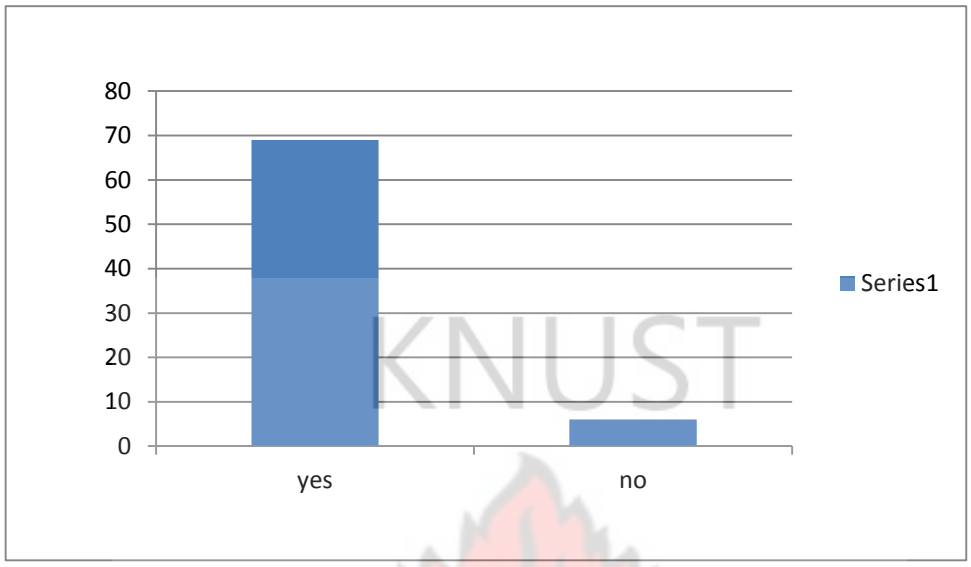
The revelations support the literature that the education reforms provided for an increase in physical facilities (TEP I, 1993), yet students are sent to Kwame Nkrumah University for Science and Technology (KNUST) for practical work. This has serious implications for CBL training. Technical education at the tertiary level is expensive (Agodzo and Songsore, 2004). The capital expenditure on plant and equipment is usually high. However, there is no easy way of achieving the objectives of Competency Based Learning (CBL) if basic tools and equipment needed for that training are unavailable in the institutions (UNESCO 2007). The revelations are not too different from the universities. Kwame Nkrumah University (KNUST), the only technical university in Ghana that has trained engineers for about half a century has

not been able to renew its stock of equipment for about 50 years ago (Agodzo and Songsore, 2004). This is as a result of high cost.

4.5 Suitability of Syllabus for HND Programmes

Polytechnic institutions have been mandated to emphasize on practical training to meet the requirements of CBL. The objective of NABPTEX is to formulate and administer among other things, standards for skill competence and syllabus competence for non-university tertiary institutions. It is expected that the syllabus should help meet the requirement of CBL. The establishment of the polytechnics was expected to meet the middle-level technical manpower base of the country (NCTE 2006). Bloom, Canning and Chan 2006 has stressed that there is a need for tertiary institutions to adjust their programmes, curricula, structure and teaching and learning methods to ensure that they meet the technology of this age. Lecturers were asked whether syllabus is suitable for HND programmes. The reason for this question was to find out whether the syllabus will help achieve the purpose of establishing polytechnic. This is in agreement with Garvin (1987) who discovered that the probability of a product working fault free within specified time period is reliability of the product. In tertiary education it was found out that the dimension represents the extent to which knowledge gained is correct and up- to- date. The outcome is shown in the figure 4.2.

Fig 4.2 Academic Staff Response to Suitability of Syllabus for HND Programmes.



Source: Author's Field Survey, July 2011

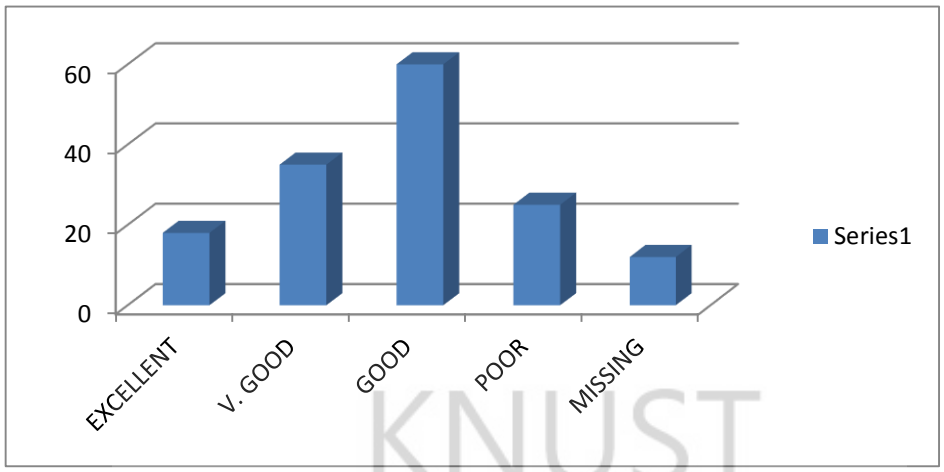
From the figure, 69 out of 75 which represents 92 percent were of the view that the syllabus used is very comprehensive and covers all aspects of the programme. According to them it emphasizes on practical approaches that could address the middle level manpower needs of the country. However, 8 percent of the lecturers thought that the syllabus is outmoded considering the present technological age. They argued that it is necessary to review the syllabus to meet the current trends in technology. An interview with the Deans of some schools revealed that NABPTEX reviews the syllabus every ten (10) years but the question of concern is that, can the syllabus respond to the technological needs of society given the period of review? Owlia and Aspinwall (1996) in explaining Watts (1996) software dimensions of quality explained that reliability of a product as applied to higher education is the degree to which knowledge learnt is correct, accurate and up-to-date.

4.5.1 Student Assessment of Teaching Methods of Lecturers

Students were given the opportunity to assess the teaching methodologies of their lecturers. This is important because if lecturers use very good teaching methods, students will understand the course very well and can apply adequately at the workplaces. It is expected that teaching methods of lecturers meet the CBL system. A CBL instruction system is based on four main learning phases which include; identification of knowledge to be learnt by the student, development of the skill or knowledge, testing the skill to demonstrate the level of achievement by the student and evaluation of the results of the skill training (Nsiah, 2007). The CBL is learner centred and teaching methods should be geared towards that. The teaching methods must integrate theory and practice and ensure that students have clear idea about what they learn and why they learn.

Students were given the option to select whether teaching methods used by lecturers are excellent, very good, good or poor. The outcome reveals that 18 out of the 150 were of the view that teaching methods are excellent while 35 and 60 thought the teaching methods used by their lecturers are very good and good respectively. Twenty-five (25) of the students stated that the methods are poor and such lecturers don't qualify to teach. Twelve (12) students did not answer the question for reasons best known to them. The information shows that 113 out of 138 valid respondents accepted the idea that teaching methods used by lecturers are good. This constituted 81.88 valid percent of the students. Only 18.12 percent of the valid respondents did not agree that lecturers teaching methods are good. The information is shown in figure 4.3.

Fig. 4.3 Students Assessment of Teaching Methods of Teaching Staff



Source: Author's Field Survey, July 2011

4.6 Assessment of Students

In the CBL system, after identifying the skill that students are expected to acquire, they are developed and tested. The unit of progression is mastery over specific knowledge and skills (Nsiah, 2007). Students are assessed for a number of reasons. According to Management of the polytechnics, students are assessed for promotions and for the award of certificates for employment. When lecturers were asked of the form of assessment administered to students, almost all lecturers reported that they assessed students in individual assignments, group assignments, quizzes, mid-semester examinations, end-of-semester examinations etc. However the frequency of assessment differs from one institution to the other. The reasons given for the purposes of assessment are inconsistent with NABPTEX reasons for standardizing the conduct of examinations.

4.6.1 Conducting HND Examinations

The conduct of HND examinations goes through a number of processes including moderation of test items, administration of the examination and the verification of marked scripts. On the moderation of test items, NABPTEX is responsible for it. By using the same moderators for the programmes from different polytechnics, sub-standard questions are easily detected. They also ensure that questions set are within the curriculum and the specification. NABPTEX also ensures that questions can be answered within the stipulated time. NABPTEX in the process of moderation directs lecturers to submit marking schemes with the questions. Moderated items are then sent back to the institutions for typing and printing.

Lecturers were asked whether their questions pass through vigorous moderation of NABPTEX, and the outcome is shown in table 4.13

Table 4.13 NABPTEX Moderation of Questions

RESPONSE	FREQUENCY	VALID PERCENT
YES	48	67.6
NO	23	32.4
TOTAL	71	100
MISSING	4	

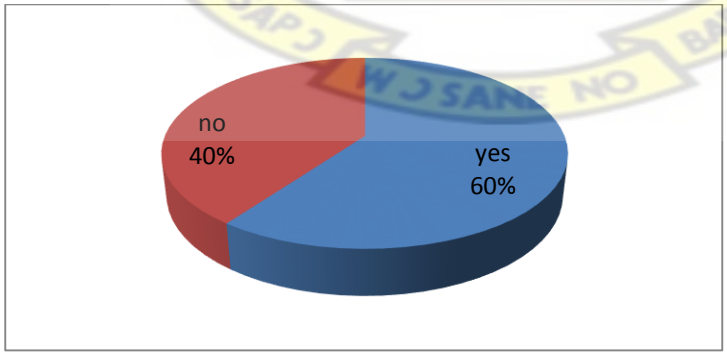
Source: Author's Field Survey, July 2011

From table 4.13, of the 75 lecturers interviewed, 71 responded. Forty-eight out of the 71 said that their questions pass through NABPTEX moderation before they are written. This figure represents 67.6 percent of the lecturers who responded. However 23 stated that their questions don't go to NABPTEX for moderation. Those who

refuse to submit questions to the board for moderation, explained that at times their questions delay at NABPTEX, and sometimes too, it is speculated that NABPTEX is a source of examination questions leakage.

Lecturers' response to the question of whether examinations questions pass through NABPTEX moderation is not significantly different from that of management. Sixty (60) percent of management explained that questions always go through moderation process in order to meet NABPTEX requirements. Forty percent on the other hand responded that questions do not go for moderation for a number of reasons. They attributed not sending questions to NAPTEX to delays. According to them some lecturers do not submit their questions to their Heads of Department (HODs) on time. As a result they are not able to meet NABPTEX deadline. Secondly NABPTEX sometimes do not submit questions as scheduled. This could be as a result of late submissions of lecturers' questions to NABPTEX. Management response is shown in fig.4.4

Fig. 4.4 Management Response to the Moderation of Examination Questions



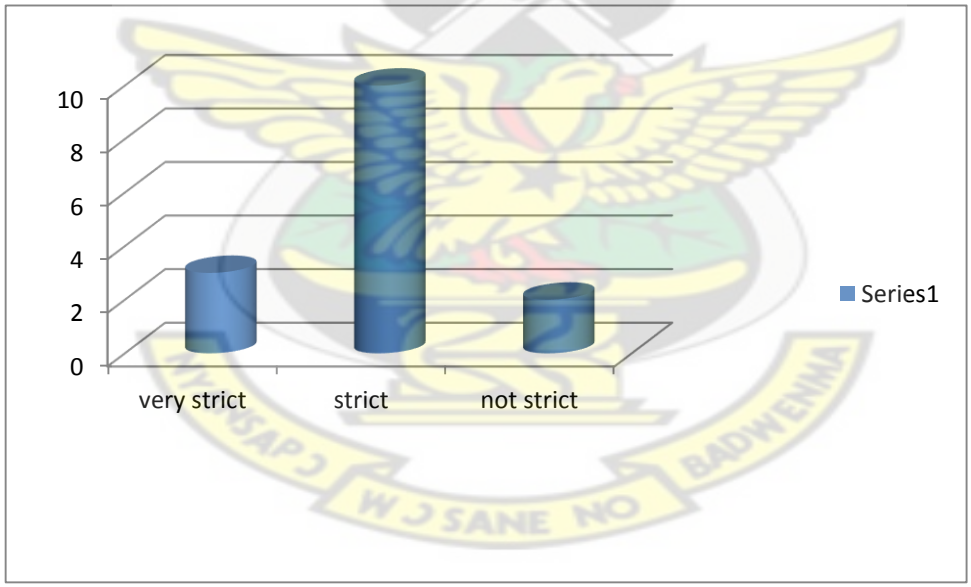
Source: Author's Field Survey, July 2011

4.6.2 Administering the Examinations

Lack of proper invigilation during examinations can seriously affect the examination results. As a result NABPTEX ensures that invigilators remain vigilant throughout the examination period. They also ensure that seating arrangement of candidates are 1.25m in all directions, the number of invigilators per examination hall (At most 40 students to 1 invigilator) and how invigilators conduct themselves.

Considering standards for examinations, Management of polytechnics were asked to place their institutions as to how strict they are, in relation to conformity to standards. The outcome is shown in figure 4.5

Fig. 4.5 Strictness of Examination Rules



Source: Author's Field Survey, July 2011

Figure 4.5 shows that majority of polytechnics are strict as far as examination is concerned. This category constituted 10 out of 15 and represent 66.67 percent. This was followed by institutions that are very strict on examinations. They formed 20 percent of management views on examination regulations. Only 2 out of the 15

representatives of management responded that examination rules are not strictly enforced to meet standards. This constitutes 13.37 percent. The gravity of enforcement infers low examination malpractice.

4.7 Industrial Attachment

Industrial attachment as a component of CBL is vigorously pursued by all institutions. All the 150 students interviewed go for industrial attachment twice in the 3 year study period. The relevance of industrial attachment as explained by Management of some institutions is to enable students receive practical training at a workplace on what they have studied in the classroom. How do students get placement is a matter of concern to stakeholders. Management was asked about how students get placement in institutions for industrial attachment. This is illustrated in table 4.14

Table 4.14 Placement of Students for Industrial Attachment

STUDENT PLACEMENT	FREQUENCY	PERCENT
SCHOOL	4	26.67
STUDENT'S OWN EFFORT	10	66.67
OTHER	1	6.67
TOTAL	15	100.01

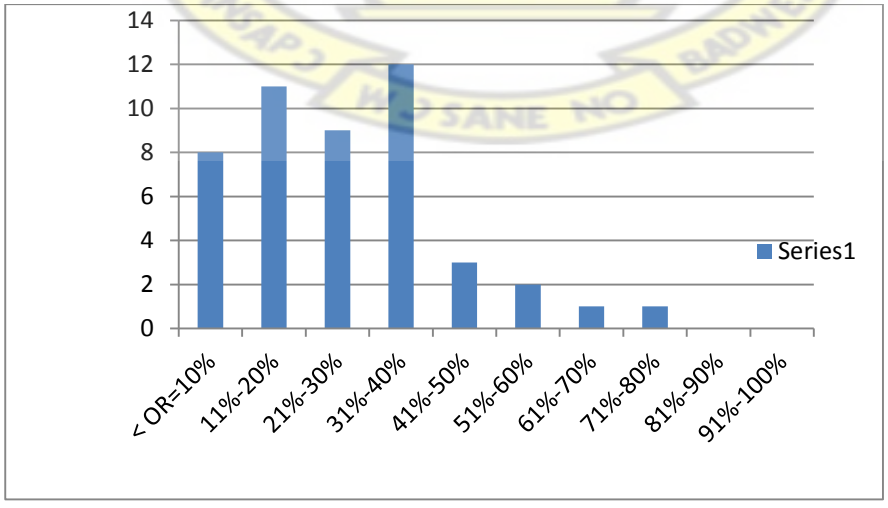
Source: Author's Field Survey, July 2011

In the ideal case, the Liaison Office is supposed to seek placement for all students but this is not done because of the difficulty in seeking placement for all students and accommodation problems in the cities and towns. What they do instead is to give introductory letters to all students. When management was inquired about who placed

students in various institutions for industrial attachment, 66.67 percent of them stated that students get placement through their own effort. According to them most students get placement because of their social networks. Four out of the 15 respondents which represents 26.67 percent of management thought that students gain placement through the efforts of the institutions but 6.67 percent of respondents were of the view that students could get placement through other means, of course they could not specify the means.

The results have serious implications on industrial attachment since majority of students look for places themselves. The issue is whether students get the right institutions for attachment. The researcher demanded from the 75 lecturers whether they have ever supervised industrial attachment. The response revealed that 47 out of 75 which represent 62.7 percent have ever supervised students' industrial attachment. The 47 lecturers were further asked to put students who had gained placements in the right institutions into specified classes. This is shown in figure 4.6.

Fig. 4.6 Right Institutions for Industrial Attachment



Source: Author's Field Survey, July 2011

From figure 4.6 as many as 12 lecturers out of the 47 representing 25.5 percent stated that between 31 percent and 40 percent (31%-40%) of students get the right institutions for their industrial attachment. According to them, the remaining 60 percent do their attachment at places which have no direct relevance to their courses. They further explained that even though students do industrial attachment, the purpose of it is not achieved. A case in point is where a second year catering student did her attachment with a mining company as a secretary. Eleven lecturers (11) were of the view that between 11% and 20% gets the right placement while 9 lecturers thought that about 21%-30% of the students get the best institutions for attachment. Eight lecturers (8) believed that at most 10 percent of the students had good placement for industrial attachment. Three (3) lecturers were of the view that between 41% and 50% had good placement while 2 lecturers stated that between 51% and 60% get good placement for attachment. A lecturer each thought that between 61% and 70% and between 71% and 80% of students respectively does their attachments at institutions which have bearing on the programme of study.

It is clear from the figure that majority of the lecturers support the view that most students do not undertake industrial attachment at the right places. This picture could also be attributed to the fact that students find it difficult to get the right placement and it also underpins the fact that managements' support for placement is discouraging. This presupposes that the purpose of industrial attachment is not well achieved. The Association of Ghanaian Industries (AGI) and the Ghana Employers Association (GEA) are teaming up with the Polytechnics under a NABPTEX promoted project to find a workable industrial attachment programme for staff and students but the impact is not yet felt. 'Currently, due to no fault of the Polytechnics,

students are still left to fend for themselves when it comes to industrial attachments and one would be lucky to get placement and if one does , whether such placement is of any relevance to the programme being pursued at all' (Agodzo and Songsore, 2004). An interview with some Liaison Officers in some polytechnic institutions revealed that looking for placement for students also mean looking for accommodation for students which would be expensive for institutions to finance.

4.8 The Output of Polytechnic Education

The CBL system demands an evaluation of the results of the skill training (Nsiah, 2007). The final results of students were examined by grades (first, second class upper, second class lower, pass and fail). Table 4.15 shows HND results of five selected polytechnics from 2007 to 2010. In 2007 a total of 4616 were awarded with HND certificates. This figure increased over the years from 4616 in 2007 to 8828 in 2009 and then increased further to 9560 in 2010. The general increase over the years could be attributed to increased access to tertiary education in general.

About 51.72 percent increase in the number of students who qualified for the award of HND from 2007 to 2010 may be due to good mechanisms put in place by management to ensure that students who enter polytechnics are given the right training to come out as good products. The table also shows that in 2007, only 80 students out of the 4616 students which represent 1.73 percent had first class while 53 percent had second class upper. In 2008, the percentage of first class has decreased to 1.54 percent while second upper division registered a decrease from 53 percent to 44.5 percent. The general decrease in percentage points of the number of first class and second upper divisions from 2007 to 2010 could be attributed to factors such as

increased enrolment without proportionate increase in facilities, lack of teacher motivation, unacceptable teaching staff-student ratio etc. However, as the number of the first and second upper classes decline, that of second lower division increases. For example, students with second class lower honours increased from 44.3 percent in 2007 to 52.8 percent in 2008. From 2009 to 2010 the percentage of second class lower honours on the average was about 51 percent while that of students with second class upper within the same period averaged about 43 percent. The shift of the bulk of students from upper division to lower could also be due to factors that adversely affect quality of teaching and learning.

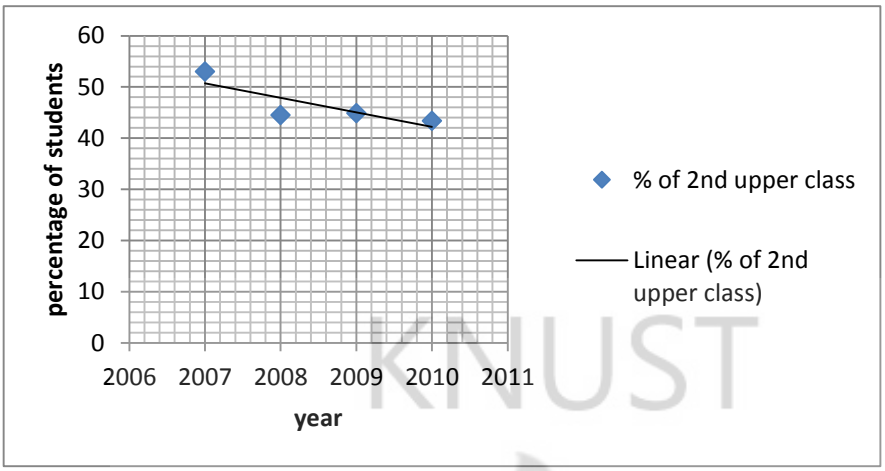
4.15 Analysis of HND Results from 2007 - 2010

YEAR	FIRST CLASS	2ND CLASS UPPER	2ND CLASS LOWER	PASS	TOTAL
2007	80	2448	2044	44	4616
2008	112	3232	3836	80	7260
2009	112	3972	4512	232	8828
2010	136	4148	4884	392	9560
TOTAL	440	13800	15276	748	30264

Source: Planning Units of Selected Polytechnics

A trend analysis on the percentage of students with second upper class division over the period is shown in figure 4.7

Fig. 4.7 Trend Analysis of the Percentage of Students with Second Upper Division from 2007 - 2010



Source: Author's Field Survey, July 2011

The graph shows a downward trend of the number of students with second upper class division from 2007 to 2010. From the graph, a negative gradient of 3.2 was computed and an equation of the linear graph y = mx + c (where y represents the percentage of students with 2nd upper class division, m represents the slope, x represents the years and c represents the intercept on the y-axis) can be computed as y = 56.2 – 3.2x. From the linear equation, percentage of students who had second upper class honors can be computed beyond 2010. For example, the percentage of students who will score second upper in 2013 can be calculated as y=56.2-3.2(7) (given that year 2007=1) which is equal to 33.8. The trend requires management to put in drastic measures to arrest the situation.

CHAPTER FIVE: SUMMARY OF FINDINGS, RECCOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter attempts to summarize the main findings and issues that have come out of the study. The findings are basically on the caliber of students and teaching staff that enter polytechnics in Ghana (inputs).The caliber of students was looked upon in terms of the grades with which students entered polytechnics, whether students were admitted through direct entry, as matured applicants or any other means. It also looked at the activities students have been taken through to ensure they come out as good products to support the development of the economy. It assessed quality and quantity of school facilities for training. The findings also consisted of an assessment of polytechnic output using HND results of students. The chapter recommends ways of tackling the challenges.

5.2 Summary of the Main Findings

Most students enter polytechnic institutions with WASSCE/SSCE results and with the Access course organized by NABPTEX. Majority of students enter with grades of between the aggregate of 21 and 29. It was found out that students would have preferred university education to polytechnic if they had satisfied the cut-off points for entry to the university.

Majority of full time teaching staff were first degree holders. In terms of ranks, lecturers constitute the majority.

The enrolment in science and technology programmes was far below that of business related programmes. With a high student-teacher ratio of above standard, management has divided classes into group of two or more to ensure that they meet standards or improve over the ratio.

Facilities such as library, workshops, tools and equipment were found not to be very adequate.

Most lecturers use approved syllabus which is reviewed every ten (10) years. The length of review does not correlate with changes in technology. Lecturers adopt good teaching methods which emphasized on competency based learning. Examination questions go through NBPTEX moderations.

All students undertake industrial attachment twice in the three (3) year study period. Industrial attachment was found out to be very relevant to programmes of study; however most students do not do the attachment in the right institutions because of problems associated with placement. As a result students do not acquire the right skill and practical experience relevant to programme of study.

The output in terms of HND results was found to be good. The results showed a decline in the number of students with first and second upper classes and an increase in second lower and pass in the period of study (2007-2010).

5.3 Students' Entry to Pursue HND Programmes

Students are admitted to pursue HND programmes with SSCE/WASSCE, access programme organized by NABPTEX for technical and vocational students, Mature Entry , GCE 'A' Level and other non tertiary courses organized by tertiary institutions such as Electrical Engineering Technicians (EET), Mechanical Engineering Technicians (MET), Fashion Advance, Diploma in Business Studies (DBS), ABCE etc. All admitted students have acquired secondary education and therefore satisfies one of the NCTE requirements which demand a minimum completion of secondary education for all tertiary programmes. Majority of the students (50 percent) were admitted with SSCE/WASSCE and 30 percent came in through the access programme.

Of those admitted with SSCE/WASSCE, as high as 81.33 percent had aggregates of between 21 and 36 with only 0.67 percent with aggregate of below 16. Majority of the students satisfied the cut-off points of various departments but 90 percent of them would have preferred university education to polytechnic education if they had satisfied university requirements. This presupposes that students who enter polytechnic to pursue HND programmes have relatively weaker grades.

5.4 Teaching Staff of HND Programmes

The study revealed that out of 1327 full time teaching staff who handles HND programmes in the five selected institutions, 43.86 percent conformed to NCTE acceptable standards. The council requires a minimum of second degree to handle HND programmes. The implication is that the remaining 56.14 percent are not qualified to handle HND programmes.

In terms of ranks of teaching staff, conformity to standards was a problem. The study showed that only 1.73 percent was principal and senior lecturers, a variance of about 18 percent. The percentage of senior instructors and instructors also fell short of about 17 percent of the acceptable standard. However, the percentage of lecturers and principal instructors was above standard. The acceptable standard is 50 percent of the category but the research showed 82.5 percent of teaching staff.

5.5 Adequacies of Teaching and Learning Facilities

Views sought from management, teaching staff and students revealed that teaching and learning facilities are not very adequate. About 60 percent of management, 65 percent of students and 57 percent of the lecturers supported the view that academic facilities are not very adequate.

The researcher observed that all the institutions have good classrooms which are well ventilated. Projectors have been mounted in the lecture halls of two institutions. Classroom furniture was adequate but the slabs were inadequate. An interview with management unveiled that the shortage of slabs was artificial. They explained that students take the slabs from one classroom to the other, and sometimes take them to their halls of residence.

All institutions have libraries stocked with good materials, ICT centers, workshops and laboratories stocked with tools and equipment. All libraries had photocopiers where students make copies of relevant pages of books. Only one institution had its library with some computers connected to the internet. It is worth mentioning that, at the time the researcher visited the institutions, it was observed that a sizeable number of computers in the ICT centers were malfunctioned.

5.6 Training of Students

Lecturers used NABPTEX approved syllabus for teaching. The content of the syllabus is relevant to the course of study. It has sufficient practical training but is reviewed every ten (10) years which makes it lag behind changes in technology. Lecturers use good teaching methods that conform to the CBL system.

For end-of-semester examinations, lecture questions go through NABPTEX moderations. The conduct of examinations is strict.

All students undertake industrial attachment. It was found out that industrial attachment is very relevant to professional training but only 31% - 40% of students get the right placement for the programme. This could be attributed to the difficulties in getting placement. As a result industrial attachment seemed not to have achieved the purpose of its establishment.

The output in terms of HND results is generally good. The research revealed a downward trend of students with first class and second upper divisions. However, the number of students with second lower and pass increased from 2007 to 2010.

5.7 The Realities and Explanations for Deviations

The norms in respect of adequacy of tools and equipment, student-teacher ratio, science and technology programmes and business related programmes ratio etc. have not been achieved by all the five selected polytechnics. However, the level of conformity differs from one institution to the other.

The total enrolment of students pursuing tertiary level courses have increased over the years showing an increase in access for instance of about 115.2% from 1993/94 to 1994/95. Polytechnics run non-tertiary programmes as well as tertiary programmes. The implication is that facilities and funding earmarked for tertiary programmes are actually applied to both tertiary and non tertiary programmes and this could explain the inadequacy of the tools and equipment meant for HND programmes. The lack of adequate facilities could also be explained by the fact that the civil works under the reforms provided mostly for rehabilitation of existing structures without giving much consideration to the fact that some of the existing structures in the polytechnics are not suitable for tertiary level work because they were originally built for second cycle education work. Proper needs assessment of the individual institutions was not conducted to take care of their future programme needs and requirements. Three main factors could explain the lack of suitable and adequate equipment in polytechnic institutions. It could be attributed to faulty needs assessment, unsatisfactory procurement arrangements and delays in completing rehabilitation works.

Some polytechnic teaching staff did not conform to NCTE requirement in terms of qualification and rank. The literature revealed that implementation of HND with Ghana Education Service (GES) staff was problematic. This is because the staff of GES had little or no knowledge and experience of the tertiary system. Their qualifications and ranks did not meet tertiary standards. There is also a problem of staff retention due to relatively low remuneration. Many of the institutions therefore depend on part-time lecturers. As a result of the increased in enrolment with limited qualified staff, the student-teacher ratio do not con form to standards.

None of the five institutions conform to the 40:60 science/technology to business ratio. The student enrolment in the five selected institution was 33176 which implies that conforming to 60% of science/technology would mean admitting a science population of about 19906 students. This has not been achieved and could be attributed to inadequate laboratory and workshop spaces and also insufficient qualified science and mathematics teachers at all levels of the educational sector. Admission to institutions and programmes are also generally based on demands of students and not guided strictly by the norms.

5.8 Recommendations

5.8.1 Student Entry to HND Programmes

Efforts to satisfy the norms should be vigorously pursued by stakeholders especially the government. Management of polytechnic institutions should ensure strict adherence to cut-off points of departments so that the best students are admitted in the polytechnics. The National Development Planning Commission (NDPC) should provide data on manpower needs of the country to guide admissions in the polytechnics. NABPTEX should accept WASSCE/SSSCE applicants with weak grades to participate in the access programme. This will increase the number of admitted science students and improve the science to business ratio. The government should train more science and mathematics teachers and motivate them to stay on.

The government should continue its support to teaching staff especially assisting them to acquire second degrees and beyond. Management should do everything possible to ensure that, they reduce the use of part time staff or entirely do away with them. This implies assisting permanent staff to upgrade to meet national norms.

5.8.2 Teaching and learning facilities

Teaching and learning facilities are not adequate in all the five selected institutions. The government with the support of Management of polytechnic institutions should solicit assistance from the private sectors such as the oil companies to refurbish their libraries, laboratories and workshops. It was also observed that most ICT centers were not hooked to the internet and very few lecture halls had projectors. It is important that these are corrected so that teaching and learning could be enhanced in polytechnic institutions. It was revealed that most Polytechnic institutions send students to Kwame Nkrumah University for Science and Technology for practical work at an expensive fee. It would have been more cost-effective if government provides few of the polytechnics with well equipped laboratories and workshops for their use. The government should ensure that uncompleted rehabilitation works especially the laboratories and workshops in the polytechnics are completed.

It was revealed that most lecturers used approved syllabus prepared by NABPTEX. The research unveiled that the syllabus is reviewed every 10 years. The period of review affects quality of polytechnic education since technology is dynamic. It is recommended that the syllabus is reviewed by NABPTEX every 5 years instead of 10 to ensure that the content of the syllabus moves with modern trends of technology.

5.8.3 Industrial Attachment

Industrial attachment was found to be very relevant in building the practical knowledge and skills of students. However it was discovered that majority of the student did their attachment at institutions which had no relevance of practical training to students. This was because students found it difficult in getting suitable

places. It is therefore important that the Liaison Office of the institutions search for the appropriate places (institutions where students will acquire practical knowledge of what they have learnt in the classroom) for students who cannot get the right institutions. NABPTEX could also liaise with recognized institutions for industrial attachment.

5.9 Conclusion

The entry aggregates of students into HND programmes are relatively weak. Most students would have preferred university to polytechnic if they had satisfied the cut-off points of various courses offered at the universities. Majority of teaching staff of polytechnics do not satisfy the standard requirements of NCTE in terms of qualifications and ranks. Management has put in place measures to improve upon the quality of its teaching staff. The ratio of enrolment of business programmes to that of science deviates from the purpose of establishing polytechnics.

Management with the support of central government and the private sector has secured adequate facilities to aid in teaching and learning. However some tools and equipment in the workshops and laboratories need replacement because they are obsolete and faulty.

Students are taken through quality practices with the support of committed teaching staff monitored by a vibrant quality assurance unit.

It is believed that careful implementation of the recommendations made would enhance the provision of quality education in polytechnic institutions.

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APPENDIX I

DEPARTMENT OF PLANNING

COLLEGE OF ACHITECTURE AND PLANNING

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

M.SC. DEVELOPMENT POLICY AND PLANNING (DEPP)

TOPIC: MEETING NCTE AND NABPTEX STANDARDS BY POLYTECHNICS IN GHANA. EXPLORING THE REALITIES.

Dear Respondent,

I am a MSc. Student of KNUST carrying out a study on quality assurance in Ghanaian polytechnics as part of my research project. As an administrator of this institution, your views are important in the study. Your response will be treated with the utmost confidentiality. Thank you.

INTERVIEW GUIDE

QUESTIONNAIRE FOR MANAGEMENT/ADMINISTRATORS

Name of Polytechnic……

Position/Designation of Respondent……

Number of years on current position…….

Section A: Students' Entry Requirement for HND Programmes

1. What are the entry requirements for HND programmes in your institution?
   ……
   ……
   ……
2. What is the mode of entry for HND programmes?
3. SSSC/WSSC…… Mature…....ACCESS…….. PRE-HND…….. Other……. (specify)
4. Do all prospective students meet entry requirements for HND programmes?
   YES ◯ NO ◯
5. What is the cut-off point for admissions of departments?

6. Would you agree that most applicants for admissions to your polytechnic would choose university education if they qualified?
   YES ◯ NO ◯ NOT SURE ◯
7. Would you say that all students admitted to pursue the HND programmes meet the required cut-off points?
   YES ◯ NO ◯ NOT SURE ◯
8. If your answer to Q7 is 'NO', what is/are often the reason(s) for which they are admitted to the poly
   .....
   .....
   .....
   .....
9. Would you say that admissions procedures for prospective students of your polytechnic that the best candidates are selected?
   YES ◯ NO ◯
   What is your reason for your answer to Q9?
   ……
   ……
   ……

10. Have you ever been approached by a prospective student for admission assistance?

    YES ◯ NO ◯

11. If the answer to Q10 is 'YES', did these prospective students meet the cut off points required for his/her course of interest?

    YES ◯ NO ◯

Section B: Teaching and Learning Environment

12. Do you know of any teaching staff that, in your estimation would not pass for a good teacher? YES ◯ NO ◯
13. What would you say is/are your major concerns about teaching staff of your polytechnic?.....

    .....

    .....

    .....
14. How adequate are teaching facilities for your polytechnic?

    Very adequate ◯ Adequate ◯ Not very adequate ◯ Inadequate ◯
15. What particularly is/are your major concerns about teaching and learning facilities for your polytechnic?

    ……

    ……

    ……

    …….

Section C: Quality Training Issues

16. Are the courses and course contents suitable for quality training?

    YES ◯ NO ◯
17. Do you consider teaching methods used by lecturers as suitable for quality traini◯YES ◯ NO
18. Are teaching aids adequate for training students?
19. YES ◯ NO◯
20. Do students go for industrial attachment programmes?

    YES ◯ NO◯

21. If yes how do students get placement for industrial attachment?
    Placement by students' own effort ◯ by the school ◯ other ◯ specify…
22. About how many of your students get the right institutions for their attachment programmes? ……. (10%, 50%, 80% etc.)
23. How strictly would you describe the implementation of examination rules of your polytechnic? Very strict ◯ Strictly ◯ Not very strictly ◯ Not strictly ◯
24. Would you say that most examination questions pass through vigorous moderation from NABPTEX? YES ◯ NO ◯
25. To what extent does examinations malpractice occur in your institution?
    High extent ◯ Low extent ◯
26. What forms of exams malpractice are identified?
    ……
    ……
    ……
27. What has your institution put in place to ensure malpractice free examinations?
    ……
    ……
    ……
28. In your opinion what are the shortfalls in the procedures involved for the processing of examinations results?
    ……
    ……
    ……
    ……
29. If you have Academic Quality Assurance Unit (AQAU) in your polytechnic; in which way would you say they have helped improved quality of academic work?
    ……
    ……
    ……

30. What would you say are the short-comings of the AQAU?

    ……

    ……

    ……

31. What are the challenges of assuring quality of polytechnic education in your institution?

    ……

    .....

    .....

    .....

32. What would you suggest to management of your institution to improve on the quality of students churned out?

    ……

    ……

    ……

    ……

33. How would you assess the achievements of your institution in terms of the quality of her products? Very good ◯ Good ◯ Not very good ◯

APPENDIX II

DEPARTMENT OF PLANNING

COLLEGE OF ACHITECTURE AND PLANNING

Kwame Nkrumah University of Science and Technology, Kumasi

M.Sc. Development Policy and Planning (DEPP)

TOPIC: MEETING NCTE AND NABPTEX STANDARDS BY POLYTECHNICS IN GHANA. EXPLORING THE REALITIES

Dear Respondent,

I am a MSc. Student of KNUST carrying out a study on quality assurance in Ghanaian polytechnics as part of my research project. As a lecturer of this institution, your views are important in the study. Your response will be treated with the utmost confidentiality.

Thank you.

QUESTIONNAIRE FOR TEACHING STAFF

A: Background information about student

Name of Polytechnic……...

Department……..

Are you a full time or a part time lecturer? .....

What course do you teach? …….

B: Courses, Course Content and Delivery

1. Do you have approved syllabus for the course(s) you teach?
   YES ☐ NO ☐
2. If the response to Q1 is 'YES', who designed the syllabus?
   Department ☐ Self ☐ NABPTEX ☐ I don't know ☐

3. Do you consider the syllabus suitable for the course? YES ☐ NO ☐

4. How often is the syllabus reviewed?

Every 3 years ☐ every 5 years ☐ other ☐ specify….. Not sure ☐

6. Do you consider method of teaching as appropriate for giving quality training to students? YES ☐ NO ☐

7. How adequate are teaching facilities in your polytechnic?

Very adequate ☐ Adequate ☐ Not very adequate ☐ Inadequate ☐

8. What are your concerns about teaching and learning facilities

……

…….....

9. What is your class size? …….....

10. In which way does the size of your class affect quality delivery?

11. Is the classroom space appropriate for the class? YES ☐ NO ☐

D: Assessment of Students

14. What form of assessment do you use in assessing your students?

.....……

……

……

15. How often do you assess your students?.....

16. Would you say that most examination questions pass through vigorous moderation from NABPTEX? YES ☐ NO ☐

17. Do your students undertake industrial attachment? YES ☐ NO ☐

18. Have you ever supervised students' industrial attachment? YES ☐ NO ☐

19. If your answer to Q18 is 'YES', do you think it has relevance to their professional training? YES ☐ NO ☐

20. What are some of the challenges you face in your effort in giving quality training to students

APPENDIX III

DEPARTMENT OF PLANNING

COLLEGE OF ACHITECTURE AND PLANNING

Kwame Nkrumah University of Science and Technology, Kumasi

M.Sc. Development Policy and Planning (DEPP)

TOPIC: TOPIC: MEETING NCTE AND NABPTEX STANDARDS BY POLYTECHNICS IN GHANA. EXPLORING THE REALITIES

Letter of introduction

Dear Respondent

I am an MSc. Student of KNUST carrying out a study on quality assurance in Ghanaian polytechnics as part of my research project. As a student of this institution, your views are important in the study. Your response will be treated with the utmost confidentiality.

Thank you.

. **QUESTIONNAIRE FOR STUDENTS**

A: Background information about student

Name of Polytechnic…….

Department…….....

In which level are you? 1st year 2nd year 3rd year (please circle).

Please indicate your Sex; Male……. Female…… (Please tick)

In which mode of entry were you admitted to the polytechnic? SSSCE/WASSCE…… GCE 'A' LEVEL… ACCESS… MATURE…….. Other…… (specify)

B: Student Entry and Requirements

1.
2. With what grade /aggregate did you gain admission to the polytechnic? 6 – 9 ◯ 10 – 15 ◯ 16 – 20 ◯ 21 – 29 ◯ 0 – 36 ◯ Above 36 ◯
3. Did you choose the polytechnic because you could not gain admission to the university? YES ◯ NO ◯

Student assessment of programme and delivery

4. How relevant is your chosen programme to your profession of interest?.
5. Very relevant ◯ Relevant ◯ `Not relevant ◯
6. Give reasons for your choice in question 6

   ……

   ……

   ……
7. Do you know a lecturer whose course delivery is not satisfactory in terms of teaching?? YES ◯ NO ◯
8. Do you think most lecturers deliver well on the courses they teach? YES ◯ NO ◯
9. How are you assessed? End of semester exams…. Mid-semester exams…., Class Assignment…… Quiz….. Other……. (specify)

10. Would you say that examination rules are effectively applied in your polytechnic?
    YES ◯ NO ◯

11. Do you know of any student who is supposed to have been sacked yet still in school? YES ◯ NO ◯
12. Do you know of any student who gained admission to the polytechnic without meeting the entry requirement? YES ◯ NO ◯
13. Do you receive adequate feedback on assessment from all lecturers? Yes ◯ No ◯
14. Do you go for industrial attachment? Yes ◯ No ◯
15. If yes how many times do you go for industrial attachment for the three year period?……
16. How relevant is industrial attachment to your course of study? Very relevant ◯
    Relevant ◯ Not relevant ◯
17. How adequate is the content of the courses preparing you for the job market?
    Very adequate ◯ Adequate ◯ Not adequate ◯ I don't know ◯

18. Which courses of your program of study will you say are irrelevant to your professional development?
    ……
    ……..

19. Does the structure of your programme provide enough practical learning for your professional development? YES ◯ NO ◯
17. Are your lecturers regular and punctual to class? Yes ◯ No ◯

18. How would you generally assess the teaching methods of lecturers Excellent ◯
Very Good…. ◯ Good…. ◯ Poor ◯

C. Availability and adequacy of Facilities

19. What are challenges of learning facilities of your polytechnic? ……

……

……

20. Despite the challenges listed in Q19, would you say that teaching and learning facilities of the polytechnic are adequate? YES◯ NO ◯

21. If you have challenges of achieving your desired GPA who or what will you blame it on? Myself……◯Some Lecturers……◯Management of the polytechnic…◯ Teaching and learning facilities…◯ Financial difficulties◯

APPENDIX IV

OBSERVATIONS

AVAILABILITY AND QUALITY OF SCHOOL INFRASTRUCTURE

1. Library:……..
2. Classroom Space:……
3. Classroom Furniture:……..
4. Tools and Equipment:……..
5. Library (department)……..
6. Workshops and Laboratories:……
7. Kitchen:…….
8. Ventilation of Classrooms:…….