REPORT OF THE TECHNICAL COMMITTEE ON CONVERSION OF THE POLYTECHNICS IN GHANA TO TECHNICAL UNIVERSITIES

MINISTRY OF EDUCATION
MAY 2014

REPORT OF THE TECHNICAL COMMITTEE ON CONVERSION OF THE POLYTECHNICS IN GHANA TO TECHNICAL UNIVERSITIES

MEMBERS OF THE COMMITTEE

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Chairman

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Dr JVK Afun

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Evans T. Ankomah-Asare

Secretary

May 2014

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Acknowledgement

The Committee acknowledges with appreciation the individuals, organizations and associations, listed in Appendix 6.1, who submitted memoranda to the Committee. We are particularly grateful to the German Academic Exchange Service (DAAD) for sponsoring the study visit undertaken by members of the Committee to a number of Technical Universities and Universities of Applied Sciences.

The Committee is grateful to the Ministry of Education for the honour of being given the opportunity to undertake this important national assignment.

Our gratitude also goes to the National Council for Tertiary Education for providing the Committee with the necessary financial and logistic support that facilitated our work.

It is our pleasure to submit this Report to the Ministry of Education in the hope that the recommendations made herein will assist Government to successfully convert the Polytechnics to Technical Universities.

Abbreviations and Acronyms

AGI	Association of Ghana Industries
BTech	Bachelor of Technology
CORP	Conference of Rectors of Polytechnics
DAAD	German Academic Exchange Service (English translation)
HND	Higher National Diploma
KNUST	Kwame Nkrumah University of Science and Technology
MOU	Memorandum of Understanding
NAB	National Accreditation Board
NABPTEX	National Board for Professional and Technician Examinations
NCTE	National Council for Tertiary Education
PhD	Doctor of Philosophy
POTAG	Polytechnic Teachers Association of Ghana
R&D	Research and Development
SHS	Senior High School
TOR	Terms of Reference
TU	Technical University
UAS	University of Applied Sciences

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1.0 Introduction

His Excellency, the President of the Republic of Ghana, in his 2013 State of the Nation address, announced that the Polytechnics will be converted to Technical Universities. Students in the Technical Universities will be trained to acquire high level technical skills to drive the country's economic and national development agenda. The proposed technical universities would contribute to raising the quality and competitiveness of the Ghanaian workforce by providing opportunities for company employees to upgrade their skills and acquire new skills. The new Technical Universities would reduce the admission pressures on the traditional universities, provide progression avenues for technical and vocational students, and curb the growing phenomenon of academic-type "top-up" programmes for HND graduates at the traditional universities. Technical Universities, having a different focus and orientation from traditional universities, will contribute to creating a more diverse and better performing higher education system.

In order for Government to decide on a strategic approach to the establishment of the technical universities, the Ministry of Education set up a Technical Committee in September 2013 to develop a roadmap for the conversion of the Polytechnics to Technical Universities.

1.1   Membership of the Committee

The Committee has the following membership:

Dr George Afeti   -   Chairman
Executive Secretary, National Inspectorate Board
Former Secretary General,
Commonwealth Association of Polytechnics in Africa
Former Principal, Ho Polytechnic
Member of the Ghana Institution of Engineers (GhIE)

Cmdr. J. A. C. Combey (Rtd)   -   Member
Association of Ghana Industries

Dr J. V. K. Afun   -   Member
Rector, Ho Polytechnic
Conference of Rectors of Polytechnics

Prof G. K. S. Aflakpui   -   Member
Rector, Wa Polytechnic
Fellow, Ghana Academy of Arts and Sciences
Conference of Rectors of Polytechnics

Mr Kwame Dattey   -   Member
Executive Secretary,
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Dr Albert K. Sunnu   -   Member
Senior Lecturer, College of Engineering
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Mrs Divina D. Nkwatabisa   -   Member
State Attorney
Attorney General's Department

Prof Mahama Duwiejua   -   Member
Executive Secretary
National Council for Tertiary Education

Mr Evans T. Ankomah-Asare   -   Secretary
Assistant Secretary
National Council for Tertiary Education

1.2 Terms of Reference of the Committee

At the inauguration of the Committee, the Honourable Deputy Minister of Education in charge of Tertiary Education tasked the Committee to develop its terms of reference in line with the objective of developing a roadmap for the conversion of the polytechnics to technical universities. After a thorough discussion of this broad mandate, the Committee agreed to define the scope of the assignment to cover the following terms of reference:

i.   To review the key characteristics of a Technical University
ii.   To highlight the differentiating characteristics of a converted polytechnic as a technical university from a traditional university
iii. To recommend eligibility criteria for converting a Polytechnic to a Technical University
iv. To recommend a strategy for converting the 10 polytechnics to technical universities, with particular reference to whether all the polytechnics should be converted at the same time or on a polytechnic-by-polytechnic basis
v.   To formulate the broad mandate for the converted polytechnics as technical universities
vi. To suggest suitable names by which the converted polytechnics shall be known
vii. To make any other recommendations as the Committee may deem necessary.

1.3 Methodology

The Committee held eight (8) meetings and received memoranda from stakeholders. The Committee members also had the opportunity to travel to Germany on a one-week study visit to a number of Technical Universities and Universities of Applied Sciences. During the study visit, members of the Committee interacted with institutional leaders, the German Rectors Conference and a number of political leaders in the Parliament of the State of North Rhine Westphalia and the Federal Parliament or Bundestag in Berlin. The Committee reviewed the lessons learnt in the upgrading of the Polytechnics in Ghana to tertiary status in 1992 and the transformation of the *Technikons* in South Africa to Universities of Technology. The Committee also consulted a number of legal documents on polytechnic and higher education in Ghana.

1.4   Background Documents

The two key documents consulted were the Polytechnics Act, 2007 (Act 745) and the Report of the Technical Committee on Polytechnic Education (often referred to as "The Kwami Report") which was commissioned by the NCTE and published in June 2001. The Committee considered documents on the accreditation requirements and laid-down procedures of the National Accreditation Board for programme and institutional accreditation as a university or university college. The other background documents reviewed included several publications on the philosophy and orientation of Technical Universities and Universities of Applied Sciences in Germany and the Universities of Technology in South Africa.

2.0   Overview of Polytechnic Education in Ghana

As tertiary institutions, the polytechnics in Ghana are relatively young, having been upgraded to tertiary status only in 1992. Although the then technical institutes at Accra, Takoradi and Kumasi were re-designated as polytechnics in 1963, they continued to operate essentially as non-tertiary, second-cycle institutions, offering mostly advanced craft courses and a few technician-level courses until 1992. Tamale and Ho Technical Institutes were similarly elevated to polytechnic status in the mid-1980s followed by Sunyani and Koforidua Polytechnics in 1997. Cape Coast Polytechnic was the first polytechnic which was actually planned and established as a polytechnic in 1986; however, like all the other polytechnics, it did not gain tertiary status until 1992. Only Wa and Bolgatanga Polytechnics were conceived as tertiary institutions but even then, they became polytechnics simply by government pronouncement.

The Polytechnics Act, 1992 (PNDCL 321) elevated the polytechnics to the status of public tertiary institutions. The upgrading of the polytechnics conferred on them the authority to award Higher National Diplomas (HND) and other certificates. Since then the institutions have had their mandates strengthened and expanded under a new Law, the Polytechnics Act, 2007 (Act 745) to offer qualifications in a wide range of applied arts and science disciplines at sub-degree, degree and postgraduate degree levels. Specifically, the mission of the polytechnics is to, among other things, provide:

a) tertiary education in the fields of manufacturing, commerce, science, technology, applied social science, applied arts and any other field approved by the Minister of Education
b) opportunities for skills development, applied research and publication of research findings

Even before the enactment of Act 745, some of the polytechnics had started offering Bachelor of Technology (BTech) degree programmes in selected disciplines in affiliation with some public universities. Although the introduction of degree programmes was regarded as premature by a section of the public, the BTech programmes were expected to deepen the practical orientation of the HND qualification and provide HND graduates with advanced technical knowledge and skills as well as offer them a more logical avenue for academic and professional progression. The running of degree programmes was also expected to improve the public image of the polytechnics. In 2012, 97% of polytechnic students were enrolled in HND programmes, 2% in

BTech programmes and the rest in Technician Certificate courses. The 30 HND and 10 BTech programmes that were offered within the polytechnic system in 2011/2012 are listed in Table 1.

Table 1: Programmes offered in the Polytechnics (2011/2012 academic year)

No.	HND Programmes	No.	Bachelor of Technology Programmes
1.	Agricultural Engineering	1.	Automobile Engineering
3.	Civil Engineering	2.	Agricultural Engineering
4.	Electrical/Electronic Engineering	3.	Civil Engineering
5.	Building Technology	4.	Building Technology
6.	Mechanical Engineering	5.	Estate Management
7.	Oil & Gas Engineering	6.	Chemical Engineering
8.	Production Engineering	7.	Hospitality & Tourism Management
9.	Renewable Energy Systems Engineering	8.	Procurement Management
10.	Computer Science	9.	Entrepreneurship & Finance
11.	Computer Network Management	10.	Accounting with Computing
12.	Statistics		
13.	Science Laboratory Technology		
14.	Dispensing Technology		
15.	General Agriculture		
16.	Purchasing & Supply		
17.	Procurement & Logistics Management		
18.	Entrepreneurship & Finance		
17.	Agro Enterprise Development		
18.	Estate Management		
19.	Secretaryship & Management Studies		
20.	Hotel, Catering & Inst. Management		
21.	Hospitality & Tourism Management		
22.	Fashion Design		
23.	Industrial Arts		
24.	Interior Architecture & Furniture Prod.		
25.	Marketing		
26.	Accountancy		
27.	Banking & Finance		
28.	Accounting with Computing		
29.	Entrepreneurship & Finance		
30.	Purchasing and Supply		

Regarding the spread of course offerings, the available statistics show that about 60% of polytechnic students are enrolled in business and management programmes, although the majority of the courses on offer are in the field of science and technology. This situation does not promote the development of skilled technical human resource for the country. According to the NCTE, total enrolment in the ten polytechnics as at 2011 was 43,113, an average of 4,311 per polytechnic. The available statistics indicate that against a norm of 60:40, the science/humanities ratio in the polytechnics which was 55:45 in 1996/97, very close to the national norms, steadily dropped over the years to 30:70 in 2007/2008, then to 24:76 in 2009/2010 before improving rather insignificantly to 33:67 in 2010/2011. In 2012/13, the science/humanities ratio was 37:63 for a total student population of 53,078.

Polytechnic education emphasises the application of knowledge rather than the search for new knowledge. The thrust of polytechnic training is, therefore, on the acquisition of the relevant skills required to perform specific professional tasks without ignoring the underlying theoretical knowledge necessary for a proper understanding of the tasks to be performed.

2.1 Lessons Learnt in Upgrading the Polytechnics to Tertiary Status

The development of the polytechnics as tertiary institutions was based on a strategy of *elevation* of technical institutes or by *government pronouncement*. These two approaches to the upgrading of the polytechnics did not specify any criteria or qualifying benchmarks (in terms of physical, human and academic resources required) for elevation to polytechnic status. Nor was any provision made for them to be mentored over a period of time by well-established tertiary institutions. The absence of a clear transformation strategy was one of the critical flaws of the polytechnic upgrading process, the ramifications of which are still evident in the polytechnic system today.

The history of polytechnic education in Ghana is a chequered one. During the first ten years of their upgrading, not a single year passed without one form of agitation or the other by the students, the teachers or the non-teaching staff. There were demonstrations and boycott of lectures by students to back their demands for *recognition* of the Higher National Diploma, avenues for *academic progression* and *appropriate placement* of polytechnic graduates in the Public Service. The teachers on their part were unhappy about their conditions of service, often basing their discontent on salary disparities between them and their counterparts in the university who possess the same or similar academic qualifications. Much of the discontent and agitations witnessed in the polytechnics in the early years could be partially attributed to the absence of a clear mandate and a common understanding among all stakeholders of the role of the polytechnics in national development.

Another fundamental system development failure in the polytechnic reform exercise was the absence of clarity in the mandate of the polytechnics compared with that of the universities. Indeed, there are still some people at decision-making levels in the country today who do not understand the philosophy and orientation of polytechnic education. The polytechnics are often regarded as junior universities. Even some polytechnic students subscribe to this notion. It is this

lack of understanding of the career-oriented nature of polytechnic studies that has been largely responsible for some of the staff and student agitations in the past.

Other difficulties faced by the polytechnics in the early years included poor funding, inexperienced management staff and a sluggish administrative system. Inadequate funding was a particularly serious problem for the polytechnics, which felt marginalized in the allocation of government resources vis-à-vis the universities. Throughout the 1990s, government expenditure per university student was twelve times the amount spent on a polytechnic student.

In spite of these system development constraints, some positive transformations have taken place in the polytechnics. In 1989/1990, just before the upgrading exercise, only 2% of the teaching staff held post-graduate qualifications while 21% possessed a first degree. By 2002/2003, 28% of the teaching staff held second degrees with the majority of the rest possessing first degrees. Today, more than two-thirds of the teachers possess post-graduate qualifications including PhDs. Management of the institutions has also improved with the appointment of qualified Rectors and senior management staff, while coordination and consultation among the polytechnics have been strengthened through the activities of the Conference of Rectors of Polytechnics (CORP). However there are still a number of challenges that need to be addressed to enhance the quality and relevance of polytechnic education and training in the country.

By far the greatest challenge facing the polytechnics is their ability to recruit and retain qualified staff with relevant practical or professional experience. This is because the type of skilled professionals that the polytechnics require are also those highly sought after by industry. In this regard, therefore, the polytechnics are unable to compete for staff with industry which is able to offer better remuneration packages.

The lessons learnt from the upgrading of the polytechnics to tertiary status in 1992 provide a useful backdrop of policy shortfalls and implementation pitfalls to be avoided in converting the polytechnics to technical universities.

3.0 Consideration of the Terms of Reference

3.1 TOR 1: Key Characteristics of a Technical University

A review of the literature on technical universities in Africa (South Africa and Kenya), Europe (Germany and Denmark), and Asia (Japan and India) provided the backdrop for defining the general orientation and key characteristics of a technical university. In general, technical universities:

a) provide education and training for the world of work: students are trained to acquire high level employable skills for wage or self-employment
b) have strong links with industry and business
c) support existing and emerging productive sectors of the economy with technical expertise and R&D
d) are focused on practical research activities, including industry and market-driven joint research projects
e) offer programmes that are vocationally oriented or career focused

f) provide skills training at all levels: certificate, diploma, degree, and postgraduate degree levels
g) are autonomous or semi-autonomous in their governance and management practices
h) offer courses and programmes covering a wide range of economic activities
i) place emphasis on innovation and application of new technologies, including ICT
j) have well trained faculty imbued with both academic and professional experience
k) admit capable students into science and technology based programs
l) possess top grade teaching and learning facilities
m) engage in consultancy and contract management activities
n) encourage staff and student mobility
o) provide skills training from the middle level to the highest level possible

3.2 TOR 2: Differentiating a Technical University from a Traditional University

The decision to convert the polytechnics to technical universities is tantamount to repositioning the polytechnics within the tertiary education system which requires an expansion of their mission. The establishment of the technical universities is expected to lead to a more diversified higher education landscape with clear mission differentiations. The technical universities should therefore be differentiated from the traditional universities. What should be the key role and functions of the technical universities? What should be the philosophy that underpins a technical university in the Ghanaian context? A technical university or university of applied sciences is a technological university with focus on the *application* of technology to the various fields of learning. Some typical differentiation indicators are indicated in Table 2.

Table 2. Comparison of Technical Universities and Traditional Universities

Technical University (University of Applied Sciences)	Traditional University (Classical/Research University)
Teaching and practice-oriented	Theory and research oriented
Applied or strategic research with focus on solving practical problems and providing technology solutions that make production systems more efficient	Integration of research and teaching
Skills-driven or acquisition of employable skills	Knowledge-driven or quest for new knowledge
Focus on technology development, innovation and technology transfer	Focus on fundamental research and cutting-edge technology development
Emphasis on what must be learnt to respond to industry needs and learner interests	Emphasis on mainly disciplinary approach to learning and promotion of scholarship

The fact that technical universities emphasize a close engagement with the world of work does not mean disengagement from the basic academic orientation of higher education institutions. Engagement with industry means bringing the world of work into the classroom and placing practical knowledge and research results at the disposal of industry. Blending academic pursuits with practical goals of promoting societal and economic wellbeing of the population is one of the hallmarks of universities of applied sciences. While the focus is on applied research, technical

universities may contribute their expertise at any point along the product development chain from basic research to commercialization in collaboration with traditional (research) universities.

3.3 TOR 3: Criteria for Conversion of the Polytechnics to Technical Universities

The Committee is of the opinion that individual polytechnics should satisfy a set of eligibility criteria for conversion to technical universities. This will ensure that the converted polytechnics measure up to the standard expected of a university. In order to enhance the image of the converted polytechnics as technical universities, it is important that the conversion process is rigorous. Every effort should be made to raise the public perception and status of the converted polytechnics to the level of any other public university in the country. This requires that the polytechnics as candidates for elevation to the status of technical universities should meet certain qualifying standards and benchmarks. The proposed benchmarks, which are explained below, relate to three (3) key areas: i) institutional standing; ii) academic staff requirements; and iii) evidence of collaboration with industry and employers in the delivery of study programmes.

i.   **Institutional standing**

o   A polytechnic seeking to be granted technical university status should satisfy the existing norms, guidelines and standard requirements of NCTE and NAB for accreditation as a university, and
o   The polytechnic should be already offering or be capable of offering a certain minimum number of accredited B-Tech degree programmes in science and technology based programmes.

The existing NAB institutional accreditation guidelines specify that to qualify for university status as a science and technology institution, the university should have a minimum of two (2) Faculties and two (2) Departments per Faculty. This benchmark is aligned with the internationally accepted definition of a "University". The committee endorses this requirement for qualification as a technical university.

The committee therefore recommends that for a polytechnic to be granted technical university status, it should be offering a minimum of four (4) BTech degree programmes in science and technology based disciplines.

On the issue of **adequacy of teaching and learning infrastructure**, many of the polytechnics have fairly well-equipped laboratories and workshops, although there is the need for some re-tooling and rehabilitation of existing training facilities. Consequently, the challenge of adequate academic infrastructure for the future technical universities can be satisfactorily addressed.

ii.   **Academic staff requirements**

A key characteristic of a technical university is the requirement that the teachers should possess both academic and professional qualifications. In a technical university, possessing only an academic qualification (even a PhD) is not enough to qualify as a professor or teacher. Professional or industry experience is a key requirement. In Germany, for example, it is

mandatory for teachers in the Universities of Applied Sciences to have 3-5 years professional experience in the world of work.

The vocational orientation and industry-focused nature of the study programmes offered by technical universities demand that the teachers have industrial exposure. Recruiting, training, re-training and retaining such calibre of teachers for the converted polytechnics is a key challenge that must be addressed. Obviously, it may be difficult at the embryonic stage of the technical universities to insist on the industrial experience requirement for all teachers in the converted polytechnics. At the same time, this requirement cannot be entirely ignored.

The committee therefore recommends that any academic department seeking programme accreditation in the technical universities should be headed by at least a Senior Lecturer with a PhD and, preferably, with some industrial experience. In addition, the department must have at least 3 full-time Lecturers with relevant research master's degrees, at least one of whom must have industrial or work place experience.

iii. Collaboration with Industry

Involvement of industry and employers in teaching, organization of workplace experiential learning for students, and governance of the future technical universities is a critical success factor that will enable graduates of the technical universities to have fairly easy transition into the labour market. Cooperative education or strong collaboration with industry in training delivery is one of the distinguishing characteristics of the technical universities from the traditional universities.

The committee is of the opinion that structured and supervised internships or work place experiential learning by students should be a mandatory requirement for programme accreditation in the technical universities.

In this regard, it should be required of the converted polytechnics as technical universities to provide evidence of training and partnership agreements or MOUs signed with collaborating industry partners.

In summary, the polytechnics would have to re-engineer themselves to become technical universities. This would entail the polytechnics emphasising staff development programmes to raise staff qualifications to university levels and developing capacity for curriculum engineering, management of internships, quality assurance, applied research and technology inter-change with industry. It is also important for the polytechnics to remain focused on career-focused programmes and not fall into the *academic drift "trap"* of offering traditional university type programmes.

The above eligibility criteria would inform and underpin the recommended strategy for converting the polytechnics to technical universities as discussed in Section 3.4 under TOR 4.

3.4 TOR 4: Strategy for Converting the Polytechnics to Technical Universities

In considering a strategy for converting the polytechnics to technical universities, it should be noted that the decision to convert the polytechnics has political, academic, technical, and

financial dimensions. The key question is: should all the polytechnics be converted to technical universities at the same time or should the conversion be done on a polytechnic-by-polytechnic basis? The decision to convert the polytechnics to technical universities is a great idea with enormous potential for transforming and growing the economy and promoting national development. However, the reform process should be undertaken strategically with success as the objective. The past mistakes associated with the upgrading of the polytechnics to tertiary status in 1992 should be avoided. The future technical universities should not and must not be seen as *baby* universities or *poor cousins* of the traditional universities, although there should be room for constructive dialogue between the two types of institutions. A good idea should not be killed by either ill-conceived and weak implementation strategies or inadequate human and financial resources.

The appropriate conversion strategy would be one that underpins and supports the rationale for converting the polytechnics to technical universities. The justifications for converting the polytechnics to technical universities may be summarised as:

a. repositioning the polytechnics as strategic institutions for the training of highly-skilled human resource to drive economic growth;
b. achieving parity of esteem with the universities without departing from the practice-oriented philosophy of polytechnic education and training;
c. creation of progression pathways at the tertiary level for practically-inclined SHS students and technical school graduates;
d. increasing the flexibility of the tertiary education system by introducing well-defined articulation and credit transfer mechanisms into the system;
e. reducing the duplication of course offerings and increasing the cost-effectiveness of tertiary education in the country; and
f. enhancing the image of the converted polytechnics and the attractiveness of technical and vocational education and training in general

The above considerations demand that each polytechnic should be considered on its merit against an agreed set of eligibility criteria, as discussed in Section 3.3 under TOR 3. In this regard, an expert panel may be constituted to assess the eligibility of each polytechnic for conversion to technical university status.

The Committee therefore recommends that the strategic approach and eligibility criteria outlined in Section 3.3 TOR 3 should be adopted in converting the polytechnics to technical universities, rather than converting all the polytechnics at the same time on the basis of only Government pronouncement.

3.5 TOR 5: Mandate of the Converted Polytechnics as Technical Universities

The general philosophy and orientation of technical universities the world over provides useful indicators for defining the mandate of a technical university within the Ghanaian context. Since the converted polytechnics as technical universities are not expected to depart from the mandate of developing higher level skills for the productive sectors of the economy, the existing object of polytechnic education will remain relevant even after the polytechnics have been converted. Act 745 states the mission of the polytechnics as skills development tertiary institutions in the fields

of manufacturing, commerce, science, technology, applied social science and applied arts with emphasis on skills development and applied research. In spite of the clear mandate to concentrate on technical skills development, the polytechnics have been accused of "***mission drift***" into the running of non-technical study programmes. The course offerings and student enrolments are skewed towards arts and business programs with only about 30% of the students enrolled in science and technology programs, although the majority of the HND programmes developed by NABPTEX are science and technology based. There are two possible reasons for this: either there are not enough qualified candidates for admission into the science and technology programmes, or the various polytechnics are not offering these courses for lack of facilities and qualified teachers. Indeed, the majority of applicants for admission to the polytechnics are senior high school graduates with little or no background in science and technical subjects.

The Committee recommends that the conversion of the polytechnics to technical universities should be accompanied by clear policies and regulations to prevent the new institutions from deviating from the desired objective of providing technical training and skills development of the kind that are not currently available in the traditional universities.

The concept of a technical university differs slightly from country to country. In Germany, the Technical University (TU) is at the high end of the research university system with a focus on innovation and advanced fundamental research at the frontiers of knowledge in engineering, technology, science and medicine. The Universities of Applied Sciences (UAS) on the other hand, are teaching and practice-oriented universities with a focus on applied research in collaboration with industry and the world of work. In the UAS, more than 95% of research activities are applied and all teachers must have professional or workplace experience.

The Committee recommends that the converted polytechnics or future technical universities should be modelled along the lines of the Universities of Applied Sciences in Germany.

In general, the future technical universities in Ghana:

- should be practice-oriented with smaller classes and higher student-teacher contact hours
- should provide education and training for the world of work, i.e. students are trained to acquire high level employable skills for wage or self-employment
- should have strong links with industry and business
- should support existing and emerging productive sectors of the economy with technical expertise and applied research
- should be focused on practical research activities, including industry and market-driven joint research projects
- should offer study programmes that are vocationally oriented or career focused, with emphasis on engineering, technology, and business programmes, but not humanities
- should provide skills training at all levels: certificate, diploma, degree, and postgraduate or master's degree levels
- should be autonomous in their governance and management practices
- should emphasize innovation and application of new technologies, including ICT

- should have faculty imbued with both academic and professional qualifications
- should possess top grade teaching and learning facilities
- should engage in consultancy and contract research as regular activities
- should provide skills training to the highest level possible
- should provide admission slots for graduates of senior high technical schools and technical institutes for advanced technical education and training

Additionally, the converted polytechnics should:

- research into, and provide support for micro, small, and medium scale enterprises
- promote technology adaptation and innovation in support of local enterprises
- be seen as differentiated institutions with focus on science and technology disciplines, although relevant programmes in business and the social sciences may be offered
- promote continuous professional development and lifelong learning
- have a well-balanced curriculum combining scientific principles and theory with applied science and the acquisition of practical techniques
- develop relevant partnerships and linkages with similar institutions abroad
- integrate student/staff work place experiential learning and internships into the curriculum
- engage faculty who are both teachers and practitioners, i.e. faculty who possess both academic and relevant professional experience
- ensure strict adherence to student teacher ratios and standard norms determined by the NCTE and NAB for technical universities
- integrate entrepreneurial culture into the institutional governance, teaching, and learning activities

3.6 TOR 6: What Name should be given to a Converted Polytechnic?

The name by which an institution is known is a reflection of its mandate, philosophy and orientation. The converted polytechnics are expected to be predominantly science and technology university institutions. At the same time, they should be seen as higher education institutions dedicated to the development of high level technical skills that offer a natural pathway for the academic and professional progression of graduates from senior high/technical schools and technical institutes as well as practicing technicians, adult workers and company employees who are desirous of upgrading their technical and business skills.

In arriving at an appropriate name for the converted polytechnics, the Committee considered several options, including:

- *Technical University* (as in Kenya)
- *University of Applied Sciences* (as in Germany and in The Netherlands)
- *University of Technology* (as in South Africa)

In particular, the Committee discussed the differences in mandate between the Technical Universities and the Universities of Applied Sciences in the German higher education system. The Technical Universities in Germany are multidisciplinary institutions which offer engineering, science and science-based professional programmes, from the first degree to PhD

levels. The Universities of Applied Sciences, on the other hand, are more vocational oriented and industry-focused and offer only Bachelor's and Master's degree programmes, although graduates from the Universities of Applied Sciences may pursue doctoral studies at a Technical University. It is noted that the Technical University in Germany is a research university, engaged in cutting edge research and technological innovation in close collaboration with industry and commerce. The Universities of Applied Sciences, on the other hand, emphasize the application of knowledge and applied research with direct and immediate relevance to industry needs. The Universities of Applied Sciences in Germany and the Netherlands have the same orientation as the Technical Universities in Kenya and the Universities of Technology in South Africa. The Technical University of Kenya, for example, has its antecedents in the former Kenya Polytechnic in Nairobi, while the Universities of Technology in South Africa (formerly known as Technikons) have mandates similar to those of the Universities of Applied Sciences in Germany.

Although the envisaged orientation and character of the converted polytechnics are more in alignment with those of the Universities of Applied Sciences in Germany, it is recommended that the converted polytechnics be known as **Technical Universities**. The choice of "technical university" was informed by the following considerations:

a) This designation will give the institutions a distinct character as university-level technical skills training institutions.
b) The name "technical universities" will help differentiate these institutions from the traditional universities
c) The designation will project the image of the institutions as vocationally-oriented and industry-focused universities
d) Students from technical institutes will see the Technical Universities as a natural avenue for further education and training, providing in this way a logical and seamless academic progression route for skills development for technical school and polytechnic graduates
e) The choice of "technical university" rather than "university of applied sciences" will avoid any confusion in identity that may arise with some existing universities in Ghana, such as the University of Health and Allied Sciences
f) The other possibility of naming the converted polytechnics as "universities of technology" may create an identity clash with the Kwame Nkrumah University of Science and Technology in Kumasi, when the objective of converting the polytechnics is to establish a different kind of university.

The Committee therefore recommends that the converted polytechnics should be designated as Technical Universities.

The Committee further recommends that as and when the polytechnics become eligible for conversion to technical universities, they should be named as follows:

1. Accra Polytechnic   *becomes*   Accra Technical University (ATU)
2. Bolgatanga Polytechnic   "   Bolgatanga Technical University (BTU)
3. Cape Coast Polytechnic   "   Technical University of Cape Coast (TUCC)
4. Ho Polytechnic   "   Technical University of Ho (TUH)
5. Koforidua Polytechnic   "   Technical University of Koforidua (TUK)
6. Kumasi Polytechnic   "   Kumasi Technical University (KTU)

7.	Sunyani Polytechnic	"	Sunyani Technical University (STU)
8.	Takoradi Polytechnic	"	Takoradi Technical University (TTU)
9.	Tamale Polytechnic	"	Technical University of Tamale (TUT)
10.	Wa Polytechnic	"	Technical University of Wa (TUW)

Alternatively, the city location of the Technical University (TU) may be used to identify or designate the institution; in which case the converted polytechnics shall be known as: TU-Accra; TU-Bolgatanga; TU-Cape Coast; TU-Ho; TU-Koforidua; TU-Kumasi; TU-Sunyani; TU-Takoradi; TU-Tamale; and TU-Wa.

3.7 TOR 7: Other Related Matters

3.7.1 Funding of the Technical Universities

Adequate funding for the converted polytechnics is a critical challenge that must be addressed by the Government, policy implementers, and leaders of the polytechnics aspiring to technical university status. Skills training at the technical university level is expensive. In Germany, for example, the Government spends an amount of 5,000 – 7200€ (or the equivalent of about GH₵ 15,000 – GH₵ 21,000) on every student in a university of applied sciences per year. Currently, the Government of Ghana spends less than GH₵ 3,000 on a student in a polytechnic per year. The huge gap between the current and optimal funding levels will have to be bridged if the quality of training in the converted polytechnics is to be comparable to international standards.

3.7.2 Accelerated Staff Development Programme for the Polytechnics

Although the Polytechnics can now boast of 75 PhDs and 1,366 Master's degree holders among their combined Faculty (as at August 2013), there is the need to embark on an accelerated staff development programme to enhance the academic qualifications and professional competences of the teachers, including the provision of opportunities for the acquisition of workplace skills and experience. The Government and NCTE in consultation with the Polytechnics should therefore design and implement a targeted staff development programme to support the conversion of the Polytechnics to Technical Universities

3.7.3 Accreditation of the Technical Universities

In conformity with the Law, the new technical universities will be subject to the institutional and programme accreditation requirements of the National Accreditation Board. This will also mean compliance with any statutory institutional affiliation arrangements. However, the accreditation exercise should take into consideration the distinct or peculiar philosophy and orientation of technical universities as vocational oriented and career-focused higher education technological institutions.

4.0 Summary of Recommendations

4.1   The Technical Universities should not mimic the Traditional Universities. They should carve a niche for themselves as vocational-oriented, career-focused higher education institutions producing highly-skilled personnel to support economic growth and national development.

4.2   The Technical Universities should be seen as mainly technological institutions imparting employable and entrepreneurial skills to their students while actively engaged in applied research and delivery of technology solutions to businesses and industry.

4.3   The criteria for appointment of Lecturers and Professors of the Technical Universities should include professional or industrial experience. In this regard, the requirements for promotion of Technical University teachers should be differentiated from those of Traditional Universities.

4.4   The conversion of the Polytechnics should be strategically implemented with the requirement that a Polytechnic seeking a change in status to Technical University should satisfy agreed eligibility criteria and conditions.

4.5   The Ministry of Education should ensure that funding allocations to the converted polytechnics are commensurate with their status as Technical Universities.

4.6   The Ministry of Education should initiate action to review the Polytechnics Act to reflect the change in status to Technical Universities.

4.7   The Technical Universities should adopt the model of the Universities of Applied Sciences (the former *Fachhochshulens*) in Germany.

4.8   To allow for sufficient time to undertake due diligence on the current status of the polytechnics (including careful evaluation of their current academic standing and future study programmes and funding needs) so as to ensure that the conversion process is successful, it is recommended that the effective start date for converting the Polytechnics to Technical Universities should be **September, 2016**.

4.9   Government should explore the possibility of having experienced Professors seconded or recruited from universities in Ghana and abroad to support the new Technical Universities during their formative years.

4.10   Government should make financial provision for a targeted staff development programme for the Polytechnics in preparation for their conversion to Technical Universities.

4.11   The Ministry of Education should constitute an Expert Implementation Panel to advise on the eligibility of each Polytechnic for conversion to Technical University as well as provide technical expertise and support to the institutions during the transition period.

5.0   Key Steps in the Conversion Roadmap

5.1   Enactment of an Enabling Act

For the converted polytechnics to live up to their expanded mandate as technical universities, it is necessary to redefine their mission. It is therefore recommended that the Polytechnics Act be reviewed for consistency with the change in status to Technical Universities. In this regard, the Ministry of Education should initiate steps to develop proposals for drafting instructions to be forwarded to the Attorney General's Department for drafting of the Technical Universities Bill.

5.2   Establishment of an Implementation Committee

In the interest of transparency and equity of the reform process, the conversion of a polytechnic to technical university should be based on concrete evidence and verifiable information that the Polytechnic has met the eligibility criteria. It is therefore recommended that an Expert Panel or Implementation Committee be constituted to advise on the eligibility and state of readiness of each polytechnic for conversion to technical university status.

5.3   Collaboration with DAAD

The Ministry of Education must take steps to quickly sign a Memorandum of Understanding with DAAD to bring into full effect the content of the letter of intent signed with DAAD in April 2014.

5.4   Financial Implications

In 2014, the Polytechnics were allocated only GH₵150,571,282 out of a budget request of GH₵325,547,304, leaving a funding gap of 54%. With a combined student population of 53,078, the amount that Government spends on a polytechnic student per year is only GH₵2,836. This amount may be compared with the Euro equivalent of about GH₵18,000 (on the average) that the German Government spends on a student attending a University of Applied Sciences.

For quality skills training in the future technical universities, it is recommended that the recurrent budgetary allocation to the converted polytechnics be at a level that corresponds to at least 50% of the unit cost for training students in similar institutions in Germany. In other words, the unit cost for training students in the technical universities should be at least GH₵9,000. Assuming that the student population in the polytechnics grows to 60,000 in the next couple of years, the minimum recurrent cost to Government in converting the Polytechnics to Technical Universities is estimated at GH₵540 million per annum for the next three years.

6.0 Appendices

6.1 Organizations, Associations and Individuals Who Submitted Memoranda

1. POTAG, National Secretariat
2. POTAG, Accra Polytechnic Branch
3. POTAG, Kumasi Polytechnic Branch
4. POTAG, Wa Polytechnic Branch
5. Baraka Policy Institute
6. Association of Ghana Industries (AGI)
7. ASP Sherry K. Amedorme
8. Mark Kofi Cobblah
9. Kofi Asante-Kyei, Lecturer Takoradi Polytechnic
10. Kosi Kedem, former Member of Parliament (MP, Hohoe South)

6.2 Organizations and Institutions Visited in Germany

1. DAAD – German Academic Exchange Service
2. German Rectors Conference
3. Bonn-Rhein-Sieg University of Applied Sciences
4. TU Dortmund University (Technical University of Dortmund)
5. University of Applied Sciences and Arts Dortmund
6. Parliament of the State of North-Rhine Westphalia (NRW)
7. Ministry of Innovation, Science and Research (NRW)
8. Parliament of the Federal Republic of Germany (Bundestag)

During the study visit to Germany, the Committee Members interacted with institutional heads and officials, including: Dr Dorothea Ruland, DAAD Secretary General; Prof Hans-Rainer Friedrich, Rtd. Director General for Higher Education in the Federal Ministry of Education and Research; Prof Dr Wilheim Schwick, Rector University of Applied Sciences and Arts Dortmund; Carina Godecke, President of the Parliament of North-Rhine Westphalia; Volkmar Klein and Dr Christine Lucking-Michel, both Members of the German Bundestag.

6.3   Letter of Intent – Cooperation between the Ministry of Education and the German Academic Exchange Service (DAAD) on the Conversion of the Polytechnics to Technical Universities / Universities of Applied Sciences

Letter of Intent – Cooperation between the Ministry of Education of the Republic of Ghana and the German Academic Exchange Service (DAAD) on the conversion of Polytechnics to Technical Universities / Universities of Applied Sciences

Whereas:

1. The Republic of Ghana is desirous of converting the country's 10 Polytechnics to Technical Universities following the model of Universities of Applied Sciences in Germany.

2. The Ministry of Education has set up a Technical Committee to develop a roadmap for the conversion exercise.

3. The Technical Committee undertook a study tour to Germany from 30 March to 4 April 2014, to gather Information on the German higher education landscape and in particular on the Universities of Applied Sciences (UAS).

4. The Ministry of Education believes that this major polytechnic reform initiative should be underpinned by effective academic and professional collaboration between the converted polytechnics in Ghana and German Universities of Applied Sciences.

5. DAAD affirms that it has the necessary know-how and the right instruments at its disposal to support the Ghanaian Ministry of Education in implementing this important reform.

6. The Ministry of Education requested and DAAD agreed to facilitate the following key activities between the Universities of Applied Sciences in Germany and the converted polytechnics in Ghana:

     i.   development of academic and professional partnerships with German UAS;
    ii.   institutional mentoring of the converted polytechnics by German UAS;
    iii.   affiliation agreements with German Universities of Applied Sciences;
    iv.   academic staff exchanges;
    v.   study visits for leaders and administrators of the converted polytechnics;
    vi.   training of teaching and technical support staff;
    vii.   curriculum design; and
    viii.   specialised staff development programmes, internships and industrial attachment for lecturers of the converted polytechnics.

7. Both sides confirm their willingness to jointly conduct this partnership and to explore possible funding opportunities.

8. The modalities of the partnership, including details on the programme, its instruments and the necessary financial framework, will be subject to further negotiation. A study visit of German Universities of Applied Sciences to Ghana will be arranged. A Memorandum of Understanding will subsequently be concluded.

Done in Berlin on April 3rd, 2014.

For the Ministry of Education,   For the German Academic Exchange Service (DAAD)

Signed   Signed

Hon. Samuel Okudzeto Ablakwa (MP)   Dr Dorothea Rüland
Deputy Minister of Education   Secretary General
For: Minister