HRDC

HUMAN RESOURCE DEVELOPMENT COUNCIL

INSTITUTIONAL PLANNING FRAMEWORK FOR UNIVERSITY LEVEL TERTIARY EDUCATION INSTITUTIONS

ABOUT THE HUMAN RESOURCE DEVELOPMENT COUNCIL

The Government of Botswana through the approval of the Human Resource Development Council Act No 17 of 2013 established the Human Resource Development Council (HRDC) that became operational on the 8th November 2013, effectively replacing the Tertiary Education Council (T.E.C).

The objectives and functions of the Council are the following;

OBJECTIVES

a. Provide for policy advice on all matters of national human resource development;
b. Co-ordinate and promote the implementation of the national human resource development strategy;
c. Prepare the national human resource development plans; and
d. Plan and advise on tertiary education financing and workplace learning.

FUNCTIONS

a. Advise the Minister on all policy issues relevant to the implementation of the National Human Resource Development Strategy as developed by the Government from time to time;
b. Formulate the National Human Resource Development Plan;
c. Provide advice on the management, planning and financing with specific reference to:

    i. Internship
    ii. Apprenticeship
    iii. Workplace Learning
    iv. Reimbursing employers who have incurred training costs for apprentices and trainees;

d. Manage Funds established under Part VII of the Act;
e. Promote Workplace Learning;
f. Establish and manage a National Labour Market Information System and National Education and Skills Development data base;
g. Promote the establishment, co-ordination and approval of institutional plans for public and private tertiary education institutions and post implementation monitoring and evaluation with specific reference to:

    i. Human resource development;
    ii. Research and innovation, and
    iii. Institutional capacity building;

h. Co-ordinate, promote and support tertiary education-industry link research and innovation activities;
i. Formulate human resource development plans for key sectors of the economy through linkages with employers in the public and private sectors;
j. Develop strategies for student attachments and academically prescribed internships and promote methods of skills development; and
k. Act as a supervisory agency and co-ordinate the implementation of the National Human Resource Development Strategy and ensure a link between the different levels of education, training and skills development.

TABLE OF CONTENTS

TABLES

FOREWORD

...The strategic goal of the NHRDS focuses on harnessing the full human resource capacity of the nation by providing opportunities for Batswana to realise their full potential across all stages of the human resource development life cycle so as to build a stable, prosperous and globally competitive nation...

In the recent past, through the Ministry of Education and Skills Development and the Human Resource Development Council including the former Tertiary Education Council (T.E.C), the Government of Botswana has issued several reports that address the challenges facing the tertiary education sector. One particular policy document is the National Human Resource Development Strategy (NHRDS) Realising Our Potentials (2009), which provides direction for the transformation and restructuring of the tertiary education sector and its contribution to the realisation of the national development goals.

The strategic goal of the NHRDS focuses on harnessing the full human resource capacity of the nation by providing opportunities for Batswana to realise their full potential across all stages of the human resource development life cycle so as to build a stable, prosperous and globally competitive nation.

To ensure that the high level strategic goal of the NHRDS is well implemented, the tertiary education system has to be strengthened, enhanced and be strategically positioned. A well-structured system has to be put in place with a new institutional landscape that responds to growth, provide better value for money, increased differentiation and at the same time, have an improved strategic leadership capacity at the governance and management levels of the tertiary education institutions.

As a result, the Institutional Planning Framework for University Level Tertiary Education Institutions was developed as a tool towards institutional planning for tertiary education institutions in Botswana. This report therefore focuses on the aspects of and purposes of developing institutional planning frameworks in the areas of Governance, Academic, Enrolment and Infrastructure planning. The report, likewise, offers advice towards the development of the necessary institutional planning templates that shall be used by the tertiary education institutions.

The HRDC would like to thank Higher Education Management Africa (HEMA), FutureLead and members of the Institutional Planning Reference group and other participants in the different meetings for their support in the production of this report.

Dr Patrick Molutsi

Acting Chief Executive Officer

ACRONYMS

ASM	Assignable square metres
BIUST	Botswana International University of Science and Technology
BOCODOL	Botswana College for Open Distance Learning
CESM	Classification of Educational Subject Matter
CHE	Council on Higher Education (South Africa)
CHET	Centre for Higher Education and Transformation
DHET	Department of Higher Education and Training (South Africa)
EF	Economic Forum
FTE	Full time equivalent
GER	Gross Enrolment Ratio
HEMA	Higher Education Management Africa
HERANA	Higher Education and Research Advocacy Network
HRDC	Human Resources Development Council
IP	Institutional Planning
MIS	Management Information System
NER	Net Enrolment Ratio
NQF	National Qualifications Framework
PQM	Programme Qualification Mix
T.E.C.	Tertiary Education Council (Botswana)
SET	Science Engineering and Technology
UB	University of Botswana

EXECUTIVE SUMMARY

1. INTRODUCTION

The National Human Resource Development Strategy – Realising Our Potentials (2009) provides a strategic framework to guide Botswana's transformation and diversification agenda towards the country becoming a knowledge-based economy. The Strategy is based on the Human Resource Development Life Cycle Model that focuses on the entire continuum of the education system from early childhood development, through formal education, employment, skills training and development, and lifelong learning. This is to ensure that the system provides highly skilled human resources to meet human capacity demands at individual, societal, national and international levels.The Strategy sets out a vision that "by 2022 it will be universally accepted that the quality, productivity and motivation of its people will be Botswana's single greatest and most valuable resource".

The Human Resource Development Council Act of 2013 established the Human Resource Development Council (HRDC). The HRDC plays a pivotal role to the success of the NHRDS. The core strategic objective of the HRDC is to drive human resource development. The Council provides a single strategic focus on national human resource development and links education, and skills training and development to the strategic requirements of economic development and needs of the labour market.

The HRDC is responsible for the following four objectives:

- Provide policy advice on all matters of national human resource development;
- Co-ordinate and promote the implementation of the National Human Resource Development Strategy;
- Prepare the national human resource development plans; and
- Plan and advise on tertiary education financing and work place learning.

With regards to institutional planning – one of the functions of the HRDC is to promote the establishment, co-ordination and approval of institutional plans for public and private tertiary education institutions and post implementation monitoring and evaluation with specific reference to:

(i) human resource development;
(ii) research and innovation; and
(iii) institutional capacity building

The institutional planning function covers both public and private tertiary education institutions. The Act empowers the HRDC to require information from tertiary education institutions which the Council deems necessary to carry out its functions prescribed in the Act. The Act further seeks to bring about greater cohesion in the aims and functions of public and private tertiary education institutions by making specific reference to: human resource development; research and innovation; and institutional capacity building.

2. DEVELOPMENT AND TERTIARY EDUCATION

Before addressing each of these areas in turn the relationship between development and tertiary education specifically in developing countries was examined on the basis of a recent study of the linkages between higher education and development in eight African countries. In this study the role of higher education in development was examined by assessing the role of a selected university in facilitating development in Botswana, Ghana, Kenya, Mauritius, Mozambique, Tanzania, Uganda, and South Africa. In a concomitant study the role of higher education in development in three countries which have made successful transitions towards becoming knowledge based economies was also examined – these countries are Finland, South Korea and the United States of America.

From these studies, the following assessment of Botswana's planning framework in respect of involving tertiary education in developmental progress emerged.

1	Equitable and quality schooling	Botswana does very well in international comparative school performance testing
2	High participation rates	Botswana, after Mauritius, has the highest participation rate in SADC. To achieve higher rates will require a strong post school college sector
3	Institutional differentiation	With the establishment of new institutions and in a small country, this will require serious and unpopular prioritisation decisions
4	Link economic and higher education planning	The move towards a Human Resource Development Council, is a very important step, but strong links to other planning bodies and the business sector will be required
5	Effective partnerships	This has to be planned far more systematically, but the "innovation hubs" are a strong step in that direction
6	Strong state involvement	The creation of the HRDC reflects an intended strong involvement by government but the HRDC will need considerably increased capacity to effectively implement the policy goals
7	Strong academic core	This requires a close link between enrolment and academic planning, research and innovation priorities, the higher education information system and targeted (special incentive) interventions
8	Government, higher education, society pact	Botswana has the beginnings of a pact but a body such as the HRDC will have to consolidate that and work on consensus building

3. FRAMEWORK FOR INSTITUTIONAL GOVERNANCE

Based on an analysis of existing governance arrangements, mainly for public tertiary education institutions in Botswana, a governance framework characterised by 13 elements has been put forward as follows:

Element 1	Provision for flexibility in view of differing degrees of institutional autonomy
Element 2	Inclusion of substantive sections on institutional governance for all tertiary education institutions to be established in terms of the Tertiary Education Act.
Element 3	Safeguarding the political independence of councils and institutions by strengthening their scope of decision making
Element 4	Reduction of size of councils and number of council sub committees- this is particularly important in respect of private tertiary education institutions.
Element 5	Developing codes of conduct for councils.
Element 6	Drafting of set of council rules.
Element 7	Assessment of performance of councils.
Element 8	Development of a standard set of institutional rules.
Element 9	Council approved document of delegation of decision making.
Element 10	Annual planning sessions of councils of institutions.
Element 11	Clarity on legal relationship between senate/academic board and council.
Element 12	Inclusion of framework for senate's composition, role and functions, and mandate in the institutional rules of tertiary education institutions.
Element 13	Drawing up of framework for managing council and vice chancellor/ principal (executive management) relationships

4. ACADEMIC PLANNING FRAMEWORK

The rationale for developing an academic planning framework was partly developed in the analysis of the relationship between tertiary education and development mentioned earlier but is more specifically made up of the following sub points:

1. The changing human resource requirements associated with Botswana's National Development Plan in moving its economy to a knowledge driven economy;
2. The concomitant establishment of a Human Resources Development Council with one of its main tasks being the development of Human Resources Development Plan in support of such a knowledge economy;
3. The need to match resources available for expenditure on public services with public institutions in particular, offering a greater number of relevant and responsive academic programmes in the face of increasing competition between a number of social needs for Botswana; and
4. The need for a diversified and differentiated tertiary education system in Botswana in which academic programme initiatives are in accordance with the main academic mandates of the various institutions.

In order to establish a functional academic planning approach which has value for tertiary education institutions as well as for macro oriented structures such as the HRDC the following components of such a system have to be in place:

- Each institution must have an approved set of academic focus areas which correspond to its academic mandate;
- Botswana must have a national qualifications framework in place with a tertiary education qualifications framework as a subset;

- A working system of registering tertiary education institutions and accrediting academic programmes must be in place;
- A system for the classification of fields of study or areas of knowledge must be in place for tertiary education; and
- A working management information system which ensures conformity of terminology and of definitions must be in place and must have produced usable data for at least the past 2-3 years.

In addition to the above requirements being met, the components of the envisaged academic planning framework consist of the following data sets:

1. A distribution of existing formally accredited academic programmes according to qualification type and knowledge field for each tertiary education institution;
2. A distribution of existing academic programmes not formally accredited according to qualification type and knowledge field for each tertiary education institution;
3. A distribution of intended academic programmes for which formal PQM approval and there after accreditation approval is to be sought for each tertiary education institution for year n+1, n+2 and n+3;
4. A national distribution of formally accredited academic programmes offered by public and private tertiary education institutions in Botswana for year n; and
5. A national distribution of intended academic programmes to be offered by public and private tertiary education institutions in Botswana for year n+1, n+2 and n+3.

Academic planning in essence is the outcome of regular and planned interactions between the HRDC and the various tertiary education institutions. In this regard it would have been extremely helpful if a body representing the collective interests of public and private tertiary education institutions had already been established. The existence of such a body would do much to facilitate such interactions. These interactions define academic planning as a process having the following characteristics:

- Academic planning should be the outcome of consistent and healthy interaction between the HRDC and the various public and private tertiary education institutions;
- In addition it should simultaneously bear the characteristics of both a 'bottom-up' and a 'top-down' approach;
- Collective interactions between the HRDC and the institutions should be supplemented by interactions on a bi-lateral level between the HRDC and individual institutions; and
- An undisputed commitment by tertiary education institutions to play their part in Botswana's efforts to match its production of high level person power needs better with its human capacity needs.
- A workable sequence of submission of data by institutions and a commitment by the HRDC of supplying its national analyses timeously.

5. ENROLMENT PLANNING

The reasons for introducing a system of enrolment planning for tertiary education in Botswana are mainly the following:

- The changing human resource requirements associated with Botswana's National Development Plan in moving its economy to a knowledge driven economy;
- The concomitant establishment of a Human Resources Development Council with one of its main tasks being the development of Human Resources Development Plan in support of such a knowledge economy;
- The aim of increasing Botswana's overall Gross Enrolment Ratio for tertiary education and particularly for the public tertiary education sector;
- The need to match resources available for expenditure on public services with tertiary education enrolments in the face of increasing competition between a number of publicly provided social services for Botswana.
- Improving student throughput rates in line with the demands for an increased supply of high level person power; and
- Monitoring tertiary education's contribution to the production of high level person power with a view to increasing tertiary education's levels of responsiveness.

The main elements of an enrolment planning approach for tertiary education in Botswana are:

- A set of national enrolment targets for year n, n+1, and n+2 according to qualification levels, qualification types, knowledge fields, and tertiary education sector (i.e. public or private); and
- A set of individual institutional enrolment targets for year n, n+1, and n+2 according to qualification levels, qualification types, and knowledge fields.

These sets of enrolment figures are based on:

- An analysis of actual enrolments for tertiary education institutions for years n-3, n-2, and n-1;
- Enrolment increases required to improve Botswana's overall GER;
- Enrolments according to broad knowledge field and according to level and type and type of qualifications in accordance with anticipated human capacity needs related to the National Human Resources Development Plan or the National Development Plan while the former is being finalised;
- Increased enrolments anticipated because of the introduction of new academic programmes in some institutions; and
- The infrastructural capacity available for teaching and learning within the various institutions.

Introducing a system of enrolment planning normally requires institutions, specifically public tertiary education institutions, to introduce the practice of admission of students based on formal applications as a means of reducing the number of 'walk-in' student's i.e. students who arrive at the institution un-announced. In addition it requires mechanisms for treating consistent over and under enrolments by institutions. The best way of doing this is to establish a reasonable band of over and under enrolments for each institution and obviously for the system as a whole. Institutions displaying consistent under enrolments, after a period of 'grace' have their enrolment targets reduced and any 'freed up' places are allocated to institutions having over enrolments. Institutions displaying consistent over enrolments are required after a period of 'grace' to accept responsibility for the excess cost of the over enrolled students themselves.

Enrolment planning should, in addition, bear the following characteristics:

- Enrolment planning should be the outcome of consistent and healthy interaction between the HRDC and the various tertiary education institutions;
- It should simultaneously bear the characteristics of both a 'bottom-up' and a 'top-down' approach;
- Collective interactions between the HRDC and the tertiary education institutions should be supplemented by interactions on a bi-lateral level between the HRDC and individual institutions; and
- A commitment by tertiary education institutions to play a constructive role in Botswana's efforts to match its production of high level person power needs better with its human capacity needs as required for establishing its economy as a knowledge economy.
- A workable schedule of dates and timelines applicable to institutions for the submission of their enrolment data and to the HRDC for supplying its nationally aggregated analyses and individual institutional responses.

Typically introducing a system of enrolment planning for Botswana's tertiary education system would entail the following steps:

1. Establishment and implementation of a tertiary education management information system containing the information required for enrolment planning.
2. Reaching agreement with the tertiary education sector on the various aspects of the enrolment planning system and on the issues to be covered in a first trial run.
3. Conducting a trial run in which institutions supply their actual enrolments for years n-3, n-2 and n-1 and the HRDC uses these together with other relevant information to set up national enrolment targets for years n, n+1, and n+2.
4. Using the national enrolment targets and the actual enrolment data for the various institutions the HRDC then develops a set of individual institutional enrolment targets as part of the trial run for discussion with each institution.
5. Once these discussions have been concluded and the trial run has been completed, the system is refined through further consultation between the HRDC and the tertiary education sector.
6. The enrolment planning system is launched formally and is reviewed each year through an annual consultative session between the HRDC and the tertiary education sector.

6. INFRASTRUCTURE PLANNING

The development of an infrastructure planning framework arguably represents the greatest challenges to the HRDC of the planning frameworks covered in this report.

Infrastructure planning requires the development of highly complex and extremely technical subsystems as underpinnings which normally pose significant human capacity challenges on both the system and the institutional levels. Every effort should be made to keep such an infrastructure planning system as simple as possible while still retaining its value in tertiary education planning and decision making. In addition a reasonable assurance must exist that the desired human capacity to initiate and maintain such a planning approach on the national level as well as on the institutional exists.

Infrastructure planning is necessary for the following reasons:

- It enables an assessment of the existing provision of infrastructure to be made and in so doing to determine which institutions are suffering from building space backlogs and which are over provided in building space. This assessment is normally also the springboard for introducing higher levels of efficiency in the utilisation of space by institutions;
- It enables greater consistency in the amount and quality of building space provided for tertiary education to be achieved while at the same time yielding reliable estimates of the likely costs of new buildings in terms of generally applicable space and cost norms. These estimates play a crucial role in Government approval for new building ventures and in the final tender decisions;
- Depending on the level of detail included in the infrastructure planning framework it normally provides for accommodating variations in building requirements due to functional usage. This is particularly important for tertiary institutions which require building space for a large number of different functions all related to their main educational mandate; and
- Finally, together with the academic and enrolment planning frameworks it establishes a coherent basis for decision making as new buildings are hardly likely to be approved for an institution in an academic area which does not feature prominently in its academic planning and for which enrolment increases are expected to be very moderate.

The development of an infrastructure planning framework requires the following subsystems to be in place:

- Tertiary education programme classification system
- A system for the classification of knowledge
- A building and space classification system
- Space and cost norms for buildings

The knowledge classification system is also an ingredient of the academic planning and enrolment planning frameworks and is a determining factor in the level of sophistication of the eventual infrastructure planning framework. Two options exist regarding its use in the infrastructure planning framework.

Option 1: Using it in exactly the same format as for the other two planning frameworks. Obviously this option has to be the first choice as it would bring about the necessary cohesion between these three planning frameworks.

Option 2: Use it in an abridged or summarised manner in infrastructure planning. This approach would mean that certain of the original knowledge classifications are grouped together to form a more aggregated knowledge field such as Science Engineering and Technology (SET) or Business and Management. While simplifying the Technical complexities of calculating space over or under provision considerably, such an approach does have its disadvantages particularly when it comes to estimating the costs of a new building via the now aggregated cost norms. For example, a decision on a new building for engineering will now be based on space and cost calculations for SET as a whole resulting in the loss of valuable differentiated information.

Another approach could be to argue for a general reduction in the number of knowledge areas provided for in the knowledge classification system so as to use a somewhat simplified system in all three planning frameworks. In this approach instead of working with a knowledge system of say 20 categories one tries to scale this down to say 12 or so.

The development of an infrastructure planning framework requires the following three steps:

Step 1: The first step in the infrastructure planning process consists of the development of a Building and Space Inventory and Classification Manual. This will require some decisions to be taken on the following matters:

- The knowledge classification system to be used;
- The programmes to be recognised for infrastructure planning purposes;
- The types of spaces to be recognised for infrastructure planning purposes and to which degree space sub types are to be entertained or not; and
- Clarity on a number of definitions and concepts such as assignable space, non-assignable space, structural space, space stations, different types of space etc.

Step 2: The second step consists of developing a set of space norms for the various programmes, types of space and knowledge groupings. Once this has been done institutions can start building up a theoretical space inventory in terms of their student FTE distribution across knowledge categories. This can then be compared to their existing space allocation and the HRDC could assess which institutions are over or under provided in space. It is of course entirely possible that an institution may have an over provision of teaching space but an under provision of residential space.

The HRDC then summarises all these inventories of space and compiles a report on building space backlogs and surpluses.

Step 3: The third step consists of the development of a set of building cost norms which serve as a guide for compiling realistic estimates of the anticipated costs of new buildings. These estimates serve as guideline for the allocation of funds for any approved new building projects and form an important part of the information on which final building tenders are awarded.

In view of the complex and time consuming nature of developing an infrastructure planning framework for Botswana from first principles it is strongly recommended that the HRDC considers using an adapted form of the South African infrastructure planning framework or any other suitable infrastructure planning framework.

7. CONCLUSION

This report provides a framework for the critical building blocks required for the implementation of institutional planning in the Botswana tertiary education system. Against the background of this framework it is vital to consider and provide implementation guidance and specify the key measures required by the HRDC to facilitate the effective implementation of findings and recommendations.

Through the interaction with stakeholder reference groups, individual interviews with tertiary education institutions and Human Resources Development Council senior management the IP frameworks were identified as:

- Addressing the pre-requisite of developing HRDC capacity to ensure implementation efficiency and long term sustainability of measures introduced;
- Ensuring the institutionalisation of an effective consultative mechanism between HRDC and tertiary education institutions;
- Addressing the pre-requisite for well-informed decision-making through an adequate and comprehensive MIS that responds to HR Development Plan objectives;
- Developing the various subsystems on which such an Institutional Planning Framework rests such as a national qualifications framework, a tertiary education qualifications sub framework, a system for the classification of knowledge; a programme classification system for tertiary education in Botswana, a building space classification system, and a set of building space and cost norms;
- Recognising the need for realism regarding implementation time frames bearing in mind the nature of turnaround times and institutional preparedness to be expected in the tertiary education environment;
- Considering the gains that could be achieved through a selection of suitable candidate institutions in the public as well as private tertiary education sectors for implementation, and thereby developing case studies for demonstration and replication; and
- Accepting the need to establish a project implementation management function at the Human Resources Development Council with dedicated focus, and resourced with higher education management professionals with proven expertise and experience.

THE REPORT AND IT'S CONTEXT

1

1.1 Background to Report

During the past few years the Government of Botswana, mainly through the Ministry of Education and Skills Development and the HRDC, has issued a number of reports on various challenges facing its tertiary education system as part of its drive in moving Botswana towards a knowledge driven economy, which in turn forms a part of its national economic development strategy for the next 5-10 years. These challenges focus mainly on the role of tertiary education in providing highly skilled Human Resources to meet the human capacity demands of such an economy, the efficient and effective functioning of tertiary education institutions, and the role of the tertiary education system in research, scholarship and innovation.

Some of these reports which form the overall background to this report are:

- National Human Resource Development Strategy: Realising our Potentials- Ministry of Education and Skills Development (2009);
- Towards a Knowledge Society: Tertiary Education Policy- Government White Paper Number 37, Ministry of Education and Skills Development (2008);
- Realising our Potentials – Ministry of Finance and Development Planning and Ministry of Education (2007) and;
- Towards a Knowledge Society – A Tertiary Education Policy for Botswana. Tertiary Education Council technical Report (2006);

1.2 Scope of Report

To develop an institutional planning framework the area of institutional planning was in turn subdivided into the following four areas: Governance, academic planning, enrolment planning, and infrastructure planning.

These four areas differ somewhat from one another in nature and characteristics. For example, after the establishment of the initial governance frameworks, governance planning is not expected to entail continuous updating in the form of 3 or 4 year rolling plans similar to that of academic planning and enrolment planning. Similarly infrastructural planning is not normally cast in the form of regularly updated 3-4 year rolling plans. Infrastructural plans are usually strongly determined by the outcomes of academic and enrolment planning but the provision of funding for infrastructural development is normally less regular and more sporadic in nature, mainly due to budget constraints.

1.3 Structure of Report

This report starts off with an analysis of institutional planning in developing countries which, to a large degree depends on a ground breaking study conducted by the Centre for Higher Education Transformation in South Africa in which linkages between development and higher education were analysed in eight different African countries. There after each of the four main tertiary education areas covered in this report i.e. governance, academic planning, enrolment planning and infrastructure planning are covered in separate chapters.

INSTITUTIONAL PLANNING IN DEVELOPING COUNTRIES

2

In this part of the report an attempt is made to contextualise institutional planning in developing countries, specifically in Africa. Much of this chapter is based on a recent study of the linkages between higher education and development in 8 countries in Africa conducted by CHET commonly referred to as the Higher Education Research and Advocacy Network in Africa Project or the HERANA Project. In this study the role of higher education in development was examined by assessing the role of a selected university in facilitating development in the following 8 countries: Botswana, Ghana, Kenya, Mauritius, Mozambique, Tanzania, Uganda, and South Africa.

2.1 The World Economic Forum's Classification of Developmental Stages

During the post-independence period every African country has struggled with the problematic role of higher education in development. Different countries have responded differently, but in the above mentioned HERANA Study of eight African countries and the role of their 'flagship' universities in promoting development, three countries being Botswana, Mauritius and South Africa, are all moving away from resource driven economies towards knowledge based economies. Based on their ratings for progress towards becoming such knowledge driven economies, the World Economic Forum in 2010 classified the eight African countries included in the above mentioned study according to their 'stages of development'.

In the 'first stage of development', the economy is 'factor-driven' and countries compete based on their factor endowments: primarily unskilled labour and natural resources. As wages rise with advancing development, countries move into the second or 'efficiency-driven' stage of development, when they must begin to develop more efficient production processes and increase product quality. At this point competitiveness is increasingly driven by higher education and training, amongst other things. Finally, as countries move into the third or 'innovation-driven' stage, they compete through innovation, producing new and different goods by combining sophisticated production processes with a high-skill workforce, research and innovation.

Appendix A shows that the three 'successful' systems studied as part of this overall CHET project – Finland, South Korea and the USA – are classified as innovation-driven while South Africa and Mauritius are classified as efficiency-driven. Botswana, according the WEF's 2010 ratings is moving from being factor-driven to efficiency-driven.The remaining five African countries used in this study by CHET, being Ghana, Kenya, Mozambique, Tanzania and Uganda, are at the factor-driven stage.

2.2 Assessment of the University of Botswana's Role and Contribution towards Botswana Becoming a Knowledge Economy

In order to promote the efficiency driven stage, and finally to move into the innovation stage of development, the Botswana Government adopted the Tertiary Education Council's Consultation Paper (2005) which articulates the role of tertiary education as follows:

Botswana's tertiary education system needs to be understood within the relevant context of the processes of globalization and the national agenda for transformation as represented by Vision 2016, which are providing a series of trends, and pressures for reform. The compact of global and national demands are manifest in terms of the need for a more comprehensive definition of tertiary education, the changing role of the state as regards its direction and control over TEIs, demands for greater quality, efficiency, effectiveness and responsiveness, the need for greater involvement of tertiary institutions in developing national intellectual capacity, the need to have avenues for lifelong learning for those Batswana with less than senior secondary educational qualifications, a re-interpretation of tertiary education in terms of a service industry with society as its market place, an overwhelming demand from individual members of society to be able to access tertiary education on a life-long basis and the need for efficient pricing and provision of tertiary education opportunities, both for equity and sustainability reasons.

In line with above points of view, the resulting Tertiary Education Policy of 2008 speaks directly about the role of higher education in the knowledge economy, the associated labour market demands and the implications for information and communication technology in respect of items such as: Societal and cultural development; social demand; the changing role of the state; funding; internationalization, and private and off-shore tertiary education providers. To achieve the goals set for tertiary education in its support for moving Botswana towards a knowledge driven economy requires an approach to institutional planning that sets up the required frameworks for addressing the many challenges currently facing tertiary education in Botswana. Obviously such an institutional planning approach would benefit from the lessons learnt from countries and specifically their higher education systems that have made a successful transition to the knowledge economy.

Before discussing some of these lessons learnt from other countries the question of where Botswana finds itself currently in respect of higher education's relation to the knowledge economy needs to be answered. This question is answered by using an assessment made of the University of Botswana's role and contribution towards moving to a knowledge economy as part of the HERANA Study referred to earlier.

In this study the following assessment of Botswana and particularly of UB's role in moving the country towards a knowledge economy was made (see also Annexure B):

Botswana is a small country with a high GDP, but also a high inequality index, meaning a 'trickle-down' approach to development. Its development approach has been excessively natural resource driven, but there is a growing realisation that 'diamonds are not forever', meaning a shift towards the importance of human capital. It has access to schooling and participation in higher education is relatively low internationally, but high for SADEC, and growing. State funding is relatively high but for the elite.

At the national level, the acceptance by government of the recommendations by the Human Resource Council towards the importance of human resources, rather than natural resources, as a future driver of development is a very important step. However, as can be seen from the rankings of knowledge producers given in Appendix C, the University of Botswana is not performing well in terms of knowledge production measured by producing new doctorates and research publications.

The commitment to 'knowledge' as a basis for development is 'moderate' with a growing awareness, but not with a significant shift in resources yet. Botswana's ability of the higher education system to respond to the needs of the knowledge economy can be characterised as 'weak', as is capacity/potential for research and innovation. However, there is a growing discourse on moving towards a knowledge economy, high skills approach, with a new Science & Technology University and the planned innovation hubs. But it has as not yet invested sufficiently in either the universities or innovation, nor has it provided appropriate incentives for partnerships.

As yet an effective linking of education and economic planning is wanting, nor does there seem to be an acceptance of the knowledge economy approach across government departments. Coordination structures are weak or unsystematic and networks are more political than 'productive'.

As is reflected in the academic core analysis, the new vision of becoming a driver of a more high skills, research and innovation orientated partner in a new development path has not been realised for the university. For example, in terms of input variables University of Botswana is weak in terms of percentage of masters and doctoral enrolments (5%), percentage of academic staff with doctorates (20%) and research income per permanent academic staff member ($2000). On the output side UB is also weak regarding doctoral graduates as percentage of permanent academics (2.18%) and ratio of research publications per academic staff member (0.08).

Both government and the university are having problems in making tough reallocation decisions, meaning that the pact between government and higher education is not strong enough to make unpopular trade-offs, resulting in few real resource redistributions to implement the new vision.

The above mentioned findings have important consequences for the role and functions of the proposed HRDC in forging a functional pact with government, and through which a thorough and comprehensive institutional planning framework as proposed in this document can make a significant contribution to Botswana's socio-economic development.

2.3 Lessons Learnt from Countries that have Successfully Moved towards Becoming Knowledge Economies

To get a better understanding of the relationship between higher education and development CHET's study also involved three case studies where there is a well-established integration of higher education in national development strategies. The three case studies are Finland, South Korea and the state of North Carolina in the USA – all three located in Organisation for Economic Cooperation and Development (OECD) member countries on different continents. One of the main reasons for choosing these three countries was that in all cases there was evidence of a strong and close relationship between education and economic development in general, and higher education and economic development in particular. In addition, in all three systems a rethink of major economic policies was accompanied by a deliberate attempt to link higher education to economic development. Of particular interest is the question: What are the core conditions that are present in each of these three systems that enable their higher education sectors to contribute to development successfully and on a sustainable basis?

Common to all three these systems was a strong and agreed-upon framework for economic development aimed at realising an advanced, competitive knowledge economy, and recognition of the important role of higher education in this regard. Despite major contextual differences, the three systems exhibited the following conditions for harnessing higher education for promoting economic development:

- Their higher education systems had been built on a foundation of equitable and quality schooling. There was also an emphasis on achieving high quality higher education;
- They had achieved very high participation rates in higher education - see Annexure B;
- Their higher education systems were diverse and characterised by high levels of institutional differentiation as part of achieving their human capital, research and innovation objectives for economic development;
- Their governments ensured that a close link between economic and (higher) education planning was established and maintained;
- There were effective partnerships and networks between government, higher education institutions and the private sector to ensure that effective education and training took place and to stimulate appropriate research and innovation;
- There was strong government involvement in a number of other respects including, for example, adequate public funding for higher education; using funding to steer the higher education sector to respond to labour market requirements; and incentivizing research and innovation in the higher education sector
- Recognition that as a core knowledge institution, the university can only participate in the global knowledge economy and make a sustainable contribution to development if its academic core is quantitatively and qualitatively strong; and
- An agreement (pact) between government, universities and core socio-economic actors about the nature of the role of universities in development.

Combining the stated intention of Botswana to become a knowledge economy, instead of resource driven economy, the HERANA assessment, and the lessons from the three successful systems presented above, the following could be used as broad planning guide.

Table 1: broad planning framework to guide the activities of Botswana's HRDC

1	Equitable and quality schooling	Botswana does very well in international comparative school performance testing
2	High participation rates	Botswana, after Mauritius, has the highest participation rate in SADC. To achieve higher rates will require a strong post school college sector
3	Institutional differentiation	With the establishment of new institutions and in a small country, this will require serious and unpopular prioritisation decisions
4	Link economic and higher education planning	The move towards a Human Resource Development Council, is a very important step, but strong links to other planning bodies and the business sector will be required
5	Effective partnerships	This has to be planned far more systematically, but the "innovation hubs" are a strong step in that direction
6	Strong state involvement	The creation of the HRDC reflects an intended strong involvement by government but the HRDC will need considerably increased capacity to effectively implement the policy goals
7	Strong academic core	This requires a close link between enrolment and academic planning, research and innovation priorities, the higher education information system and targeted (special incentive) interventions
8	Government, higher education, society pact	Botswana has the beginnings of a pact but a body such as the HRDC will have to consolidate that and work on consensus building

2.4 Summary

In this chapter, some findings from CHET's HERANA Study on the linkages between higher education and development were presented. Amongst these fi ndings is that in terms of the World Economic Forum's classifi cation of developmental stages Botswana is moving from a factor driven to an effi ciency driven economy but is still to move towards the third developmental stage being that of a knowledge driven economy.

Nevertheless, Botswana's Government has committed itself towards significant movement towards a knowledge driven economy in which the fundamental role of high skills through tertiary education is recognised. This is evidenced in a number of policy and structural changes being initiated within Botswana such as the creation of a Human Resources Development Council.

From the HERANA Study and in particular from the lessons learnt from three countries which have successfully linked higher education to development viz Finland, South Korea and the USA it is clear that Botswana will not achieve its goals in respect of becoming a knowledge economy without a comprehensive planning framework which established a strong understanding and partnership between government, tertiary education and other structures in society involved with economic development.In particular a planning framework for tertiary education which emphasises the linkages between economic development and academic planning and enrolment planning is essential.

GOVERNANCE PLANNING FRAMEWORK

3

3.1 Requirements for Governance Planning

3.1.1 Tertiary Education Regulatory Framework

The Human Resource Development Council (HRDC) Act No. 17 of 2013, Botswana Qualifications Authority Act No. 24 of 2013 and the proposed University and Non-University Bill contain provisions which directly address matters concerning governance. In particular, the proposed University and Non-University Bill covers a vast number of issues relating to the establishment, governing and functioning of universities and non-universities. In doing so the proposed Bill incorporates many of the latest developments in legislation for tertiary education in quite a few developing countries, particularly those in Africa which share the same colonial history.

3.1.1 Varying Degrees of Institutional Autonomy

In a tertiary education systems where tertiary education institutions have varying degrees of institutional autonomy, there is no 'one-size-fits-all' approach in establishing a governance framework. Rather the governance framework needs to have sufficient flexibility to cater for these varying degrees of institutional autonomy. A number of approaches exist in this regard. One way is to develop a governance framework which consists of minimum standards only. Usually this is not satisfactory as the quid pro quo for higher levels of institutional autonomy is normally that of a more detailed governance framework which ensures higher levels of public accountability.

The approach adopted by the Human Resource Development Council distinguishes between two governance categories of tertiary education institutions: University and Non-University but as far as is possible applying similar other provisions to all tertiary education institutions. This enhances consistency and uniformity in many other provisions concerning the administration and provision of tertiary education. The establishment of some governance uniformity for all non-university public tertiary institutions assists newer institutions. Some countries have developed a so-called standard institutional statute which the use is mandatory unless an own institutional statute has been approved by the Minister in terms of the processes prescribed by him/her.

3.1.2 Tertiary Education Institutions and their Political Independence

In many tertiary education systems considerable effort has been exerted in ensuring the political independence of tertiary education institutions, in particular public universities. This is so that these institutions can share knowledge (teaching and learning), create knowledge (research) and apply knowledge (community service) free from the fetters of party political considerations in the broader public interest. This has resulted in the diminishing of a Minister's / President's role and influence in universities rather than a strengthening of such a role.

In line with such trends councils of tertiary education institutions normally appoint the vice chancellor or rector in terms of a process set out in the institutional statute or institutional rules and usually select a chairperson and deputy chairperson from their midst in terms of a process set out in the rules of council/governing board. In more mature tertiary education systems Councils of universities would even select and appoint the institution's chancellor – once again in terms of a process set out in the institutional rules.

This is obviously a sensitive issue and national contexts play an important role in finding a balance between a Government's public accountability for the expenditure of public funds and creating frameworks in which public institutions in particular can function for the broad public good rather than narrower party political interests. In many African countries the demise of once flagship higher education institutions can, in part at least, be attributed to growing and unwanted political interference in university affairs, particularly public university affairs.

3.1.3 Size of Governing Councils

In many countries efforts have been made to reduce council membership to a smaller number and in this case a number of approximately 16-18 is more feasible especially as more tertiary education institutions are established. Others have followed a route of specifying varying council sizes depending on the type of the institution: general universities would have larger councils than specialized universities; the latter in turn would have larger councils than a college or institute etc. Similarly some tertiary education systems have sought to diminish the number of prescribed council subcommittees by either combining some committees or by the same committee reconstituting to perform a different task such as the Audit Committee reconstituting to perform the functions of the Finance Committee.

Apart from national legislative instruments most tertiary education systems provide for the possibility of institutional statutes to be established and sometimes even require further administrative and regulatory measures to be developed by institutions such as codes of conduct for council members, formally approved systems of delegation of powers, formal performance assessment of Council's functioning etc. These additional measures will also be discussed later in greater detail.

3.2 Improving Governance Levels of Councils

A number of measures have to be put in place to improve the governance levels of councils in particular. These measures range from additional administrative and regulatory measures to conducting effective council meetings, to training for council members in the execution of their functions etc.

3.2.1 Council Code of Conduct

Codes of conduct for members of councils or governing boards of tertiary education institutions serve to emphasise public accountability as part of an overall commitment to upholding high standards of governance. The purpose of such codes of conduct is usually fourfold:

i. Establishing a common understanding of, and agreement about, standards of morally acceptable behaviour within the council/board;
ii. Providing guidance and a framework for moral decision making within the council/board;
iii. Strengthening commitment to the tertiary education institution; and
iv. Enhancing the reputation of the council/board amongst stakeholders of the institution.

Issues usually covered in such a code of conduct would include: Conduct during meetings, conflicts of interest of members of council, misleading or influencing the council, pressurising employees of the institution, disclosure of information, acceptance of gifts and rewards and/or procuring favours and rewards, interfering in the administration of the institution, appropriating or misusing university property etc.

Furthermore a code of conduct would clearly spell out what processes and procedures are to be followed in the event of a transgression (or alleged transgression) of the council's code of conduct. Usually a code of conduct would prescribe the composition, role and mandate of a small committee (which could include an external governance expert) tasked with dealing with such transgressions or alleged transgressions. Such procedures would normally include the right to request a review by the person(s) found to have transgressed the council's code of conduct and would also prescribe the manner of communication of the findings and the retention of records of such hearings and findings.

Each member of council should be required to formally and in writing acknowledge receipt of such a code of conduct upon assuming office and indicate their willingness to subject themselves to its structures.

3.2.2 Rules of Council

In addition to any specific matters raised in an institutional act or an institutional statute, councils of tertiary education institutions should have a set of approved council rules. These rules would, on the one hand summarise some of the matters regarding council's functions etc. mentioned elsewhere and on the other hand expand on these and even introduce new matters.

Such rules of council would normally cover the following issues: Composition of council, provisions regarding membership, functions and powers, delegation of powers (this is dealt with later in more detail), terms of office including provision for continuity and renewal of council membership, termination of membership and filling of vacancies, election of vice chairperson, secretary to council, schedule of meetings, meeting procedures and minutes of meetings, committees (including charters of each committee), duties of members, role of chairperson and deputy chairperson, role of secretary, confidentiality of information, code of conduct (its status and role), limitation of liability, information required from members, benefits applicable to members etc.

These rules of council are aimed at avoiding any conflicting interpretations in respect of council membership, its functions and it powers. This normally requires such rules to go into considerable detail as, for example, in prescribing the processes to be followed in electing a deputy chairperson or electing chairpersons of the various subcommittees etc.

3.2.3 Council performance evaluation

As part of good governance arrangements many councils of tertiary education institutions have introduced formalised processes of evaluating their performance on a regular basis.This is usually done through a self-evaluation exercise in which each member of council completes a self-evaluation questionnaire (anonymously if they so wish). The responses are normally analysed through the Registrar's Office by someone who is knowledgeable in the field of analysing survey results and presented to a meeting of council. Normally the Registrar is tasked with the follow up of any changes in the functioning of council as a means towards improving its performance.

Such performance evaluation questionnaires normally cover the following aspects in which council members are requested to rate the council's performance on a 5 point scale: Council's execution of its general role and responsibilities, its governance performance in general, ensuring good management, the effectiveness and efficiency of meetings of council, council's membership, the chairpersons role and functioning, the relationship between council and the vice chancellor etc. Council members are typically also expected to evaluate their own individual performance in the Council context.

3.2.4 Institutional rules and the relationship between council and other institutional structures

Councils or boards of tertiary education institutions normally have members from a variety of institutional stakeholders – in the case of universities these stakeholders would normally be senate, student representative council, convocation (or alumni association) etc. These stakeholders normally nominate persons from their midst to serve on council although once becoming members of council such persons function in their personal capacities and not as mandated representatives.

The relationship between these stakeholders and council in the overall running of the institution and particularly the way in which these nominations to council are made are normally set out in a set of institutional rules.

Institutional rules would thus specify the manner in which nominations of council members for appointment by the Minister of Education and Skills Development are to be made, as well as the manner in which representatives of senate or academic boards, from convocation (or alumni association), from other staff groupings, and from the student representative council are to be nominated and eventually elected to become members of council.

In addition, institutional rules would sometimes cover a number of other matters some of which are to be discussed in greater detail later. Some of these matters relate to senate and its structures, the student representative council and its structures, convocation (or alumni association), the executive management committee and its functioning, and the academic functions and ceremonies of the institution.

3.2.5 Delegation of decision making authority

One of the most important documents in regulating governance issues in an institution and in enabling councils to execute their fiduciary responsibilities with consistency is that of an institutional delegation document in which it formally delegates various powers and decision making functions to some of its sub committees or to the vice chancellor who is also the chief accounting officer of the institution.

Such a detailed document of levels of decision making powers is essential in avoiding misunderstandings on who is permitted to decide 'what and when' and who is responsible for 'what and when'. It is also an essential document for circumscribing the role and powers of the vice chancellor and the executive management committee. Without such a document it is virtually impossible to determine with whom the 'buck stops' in respect of a particular institutional decision or issue.

Obviously delegation documents vary in relation to the level of institutional autonomy enjoyed by an institution but usually such a document of delegations would be formally approved by council and would cover areas such as:

- Institutional governance and management offices and structures (chancellor, council and chairperson of council, vice chancellor and executive management committee, senate, student representative council, convocation, faculty boards and faculty management committees);
- Institutional statue (if applicable) and institutional rules;
- Academic matters (such as academic year, academic ceremonies, academic admission of students, registration of students, admission of masters and doctoral students, qualifications, curricula and syllabi, time tables , assessment instruments such as examinations, certificates and certification, language policies, research and innovation, structuring of departments, faculties and support units, satellite campuses, honorary degrees, inaugural lectures etc.);
- Student matters, Financial matters(such as institutional budget, budgets for organisational units, auditing, bad debts, insurance, travel and subsistence, research funding, capital projects, immovable property, investments etc);
- Staff matters (such as organisational structure, creation of new posts and abolishment of existing posts, filling of vacancies, appointment of staff, promotion of staff, training and development of staff, conditions of employment etc); and
- Legal matters (employment issues, service and other contracts, intellectual property, etc).

3.2.6 Training of council members in their governance duties

In tertiary education institutions all council/board members do not necessarily always have the required experience in exercising their overall fiduciary duties and sometimes confuse their governance role of an institution with involvement in the day-to-day running of the institution. This particular aspect is covered in more detail later. In addition many external council members are not sufficiently versed in the complexities associated with tertiary education institutions and particularly the roles played by so many stakeholder groupings in such an institution. Furthermore it is essential that council members remain abreast of international and national developments in tertiary education as part of equipping them for the fulfilment of their duties.

Finally, councils need to take the lead in the development of strategic issues such as vision, mission and values as well as with broad and overall institutional planning. In order to do this, councils need to develop their own annual sets of aims and objectives against which their performance can be measured. This is normally achieved through annual council planning meetings normally lasting one or two days. During these annual planning meetings council members would be introduced to new developments in tertiary education both nationally as well as internationally; be presented by senior management with the main challenges for the coming year; become acquainted with all legislative, regulatory and administrative processes applicable to their functioning; revisit the institutional vision, mission and values and any other major strategic thrusts such as the main academic or knowledge thrusts of the university; formulate their own aims and objectives for the next year, assess their performance over the previous period of 12 months; discuss ways of improving the efficiency and effectiveness of meetings; and assess the relationship between council and the vice –chancellor/senior management and find ways of strengthening this if necessary.

3.3 Improving Governance Levels of Senates

Suggestions can be put forward to improve the governance performance of senates or academic boards and to regulate the relationship between council and senate/academic board in particular.

This last mentioned relationship is particularly important as senates traditionally have been responsible for all academic issues in tertiary institutions with the actual accountability relationship with council sometimes being somewhat ambiguous.
As tertiary education institutions have been forced to adopt more 'managerial' approaches in the running of the institutions and have thus increasingly moved away from collegial management models to executive management models the relationship between councils and senates has, in some cases, become somewhat strained.

3.3.1 Relationship between council and senate/academic board (or academic affairs council)

While it is vital that senate, in terms of academic issues, operates with a satisfactory measure of independence it is equally vital that accountability lines between itself and council should not be open to various interpretations. One way of doing this is to spell out clearly in which areas council can take the final decision only in concurrence with senate or after consultation with senate.
In order to maintain sound inter structure relationships, it is normal that one or two council members are appointed to senates or academic boards who then report back to council on any relevant senate discussions and positions adopted by senate. Similarly senate normally has the right to nominate one or two of its members to sit on council.

In addition it is extremely difficult to see how senate in the light of its composition consisting mainly of senior academic staff members can actually fulfil its obligations of integrating the academic, financial and physical plans of a university through the annual planning and budget report. This function does not typically resort with senate in most other tertiary education systems but is a function of senior management reporting to council.

3.3.2 Senate/Academic Board's Composition and Functioning

Normally the composition and functioning of senate is set out in the institutional statutes and/or in the institutional rules of the institution where the latter usually contains far more detail than the former.

Institutional rules should spell out the composition of senate in a way that no misunderstandings can arise on membership or not. In cases where persons have to be elected to senate, the institutional rules should make it clear what processes are to be followed. In addition the persons acting as chairperson and vice chairperson of senate have to be specified, as should the composition and functions of the executive committee of senate be listed. Furthermore the mandate, role and membership of faculty boards and faculty management committees have to be set out.

As discussed earlier, the council approved document of delegated decision making authority should also spell out senate's responsibilities and rights in this regard. It is customary for a vice chancellor to give a report on a particular institutional aspect (s) to senate thereby connecting the academic fraternity to that of senior management and the administration of the university. A similar practice should be followed in respect of academic boards.

3.4 Practical Considerations in Improving Council/Senior Management Interaction

Many tertiary education institutions have been rendered largely ineffective due to strained and sometimes counterproductive relationships developing between the council (or chairperson) and the vice chancellor (or executive management committee).This report presents some of the ways to manage these relationships effectively and avoid any negative consequences for the institution. In managing council/senior management interaction, a number of practical measures should be instituted in order to manage relations between the council and the vice chancellor/principal or executive management. These will include the following:

- The appointment process of the vice-chancellor (or principal) and deputy vice chancellors (or deputy principals) should be set out very clearly and in detail in the institutional rules. This is vital in ensuring that no doubt of any kind exists as to the appointment status of the head of the institution.
- The chairperson of council and the vice chancellor/principal should be absolutely clear about their respective roles and mandates. In particular the chairperson of council (as well as other council members) should understand that the vice chancellor/principal is the CEO and the accounting officer of the institution.This is particularly vital in ensuring proper control of all financial transactions and dealings. In short, council should understand that it is not their

task to manage the institution but to see that the vice chancellor/principal and the executive management do so properly.

- The council should formally approve a constitution/ terms of reference of the executive management committee which sets out its composition and roles and responsibilities. This document should also contain the portions pertaining to any delegated decision making authority to the vice chancellor/principal and the executive management committee as approved by council.
- The vice chancellor/principal (and other members of the executive management committee) should have clear job descriptions approved by council. These job descriptions should be augmented by an annual performance appraisal based on clear goals and objectives set by council for the vice chancellor/principal and the other members of the executive management committee. The council should annually appoint not more than 2 people (usually the chairperson and deputy chairperson to do the annual performance appraisal of the vice chancellor/principal.
- Mechanisms should be in place allowing the vice chancellor/principal, preferably together with the chairperson of council to take decisions in cases of real emergency (e.g. natural disasters, student or staff unrest etc.) where such decisions would normally require council consultation and/or approval and where this is not possible.
- The vice chancellor/principal and the chairperson of council should make arrangements enabling regular communication between these two persons to occur on matters falling within council's area of responsibilities.
- The vice chancellor/principal should arrange that council members regularly receive any communiqués from him/her to the institution, as well as newspaper clippings of the institution and other developments in tertiary education and any media releases of the institution.
- The vice chancellor/principal should present a formal report on the institution's well-being and challenges faced by it at every council meeting. This report should follow a structure and pattern with which council is comfortable and should constitute a permanent item on the council's agenda and should be discussed by council members.

3.5 Summary

Based on an analysis of existing governance arrangements for public tertiary education institutions in Botswana a governance framework characterised by 13 elements has been put forward.

	ELEMENTS	FINDINGS
1.	Provision for flexibility in view of differing degrees of institutional autonomy	In order to accommodate varying degrees of institutional autonomy amongst its tertiary education institutions, the governance framework for tertiary education institutions should display sufficient flexibility in order to accommodate these varying levels of institutional autonomy.The approach of providing for two different sets of governance arrangements for public universities and for non-university public tertiary education institutions is a step in the right direction.
2.	Inclusion of substantive sections on institutional governance for all public tertiary education institutions and possibly for private tertiary education institutions as well	Establishing an overall institutional governance framework via the approach adopted in the Human Resources Development Bill which, does away with the need for individual institutional acts while allowing for institutional specifics to be incorporated in institutional statutes, is supported. Newer institutions, public as well as private, should be assisted through the development of a standard institutional statute of which the use should be mandatory unless an own institutional statute has been approved by the Minister
3.	Safeguarding the political independence of councils and institutions by strengthening their scope of decision making	The prominent role of the Minister and of the President of Botswana in certain appointments of public university offices should be monitored carefully and consideration should be given to granting more powers to councils of universities in this respect as part of creating a more 'de-politicised' context for tertiary education institutions. In particular consideration should be given to granting councils/ governing boards the right to appoint the vice chancellor or rector and for them to select a chairperson and deputy chairperson from their midst. These appointments should be made in terms of processes set out in appropriate institutional secondary legislation such as institutional statutes or institutional rules.

		This would be more in line with viewing universities, in particular, as institutions belonging to society as a whole rather than to government.
4.	Reduction of size of councils and number of council sub committees.	As part of an overall governance framework council sizes should be linked to institutional types and levels of institutional autonomy (the more autonomous, the larger the council) and existing council sizes should be reduced if at all possible. This step should be accompanied by efforts to reduce the number of sub committees of councils of institutions. The number of sub committees should likewise be linked to the level of institutional autonomy enjoyed by tertiary education institutions
5.	Developing codes of conduct for councils.	In strengthening overall institutional governance the Minister of Education and Skills Development could consider drafting regulations requiring the development of a minimum code of conduct for councils/boards of tertiary education institutions as part of their approval for registration. The HRDC may develop a standard code of conduct for governing councils of tertiary education institutions which could be augmented by individual institutions to take specific institutional issues into account.
6.	Drafting of set of council rules	In strengthening overall institutional governance the Minister of Education and Skills Development could consider drafting regulations requiring the development of a minimum set of council rules for tertiary education institutions as part of their approval for registration. The HRDC should develop a standard set of council rules for tertiary education institutions which could be augmented by individual institutions to take specific institutional issues into account.
7.	Assessment of performance councils	In strengthening overall institutional governance the HRDC should develop a standard instrument for assessing the performance of councils and boards of tertiary education institutions which could be augmented by individual institutions to take specific institutional issues into account. If deemed necessary institutions could be asked to report on the broad outcomes of these assessments as part of their annual reports submitted to the Minister of Education and Skills Development.
8.	Standard Set of Institutional Rules	In strengthening overall institutional governance the HRDC should develop a standard set of institutional rules detailing, amongst other, the nature of relationships between council and other institutional structures such as senate/academic board, student representative council, convocation or alumni association etc. and which regulates the processes whereby nominations from these structures to council are made. In addition such institutional rules normally cover issues related to senate/academic board and its structures, the student representative council and its structures, convocation (or alumni association), the executive management committee and its functioning, and the academic functions and ceremonies of the institution.

9.	Council approved document of delegation of decision making	In strengthening overall institutional governance the Minister of Education and Skills Development could consider drafting regulations requiring the development of a minimum set of council approved delegations of decision making for tertiary education institutions as part of their approval for registration. The HRDC should develop a standard set of delegations of decision making which could be augmented by individual institutions to take specific institutional issues into account.
10.	Annual Planning sessions of council of institutions	In strengthening overall institutional governance the HRDC should develop a framework for annual planning sessions of councils of institutions. Publications covering the main functions of councils could be used in setting up such a framework for council planning sessions. In addition the Minister of Education and Skills Development may wish to consider using the HRDC to arrange an annual workshop between him/her and council members where solutions to mutual governance challenges can be sought
11.	Clarity on legal relationship between senate and council	In finding a correct balance between the independence of senate in all academic matters and council's overall legal responsibility for the institution, where applicable, it may be necessary for the HRDC to examine the legal relationship between senates and councils of tertiary institutions and report to the Minister of Education and Skills Development in this regard. In addition consideration should be given to making the integration of academic, financial and physical plans of a university a function of senior management reporting to council in this regard and not of senate
12.	Inclusion of framework for the senate's composition, role and functions, and mandate in the institutional rules of tertiary education institutions	In strengthening overall institutional governance the HRDC should develop a suggested framework for senate's composition, role and functions, and mandate for inclusion in the institutional rules of tertiary education institutions. Institutions could augment the elements of such framework to incorporate their own institutional contexts if necessary
13.	Drawing up of framework for managing council and vice chancellor/principal (executive management) relationships	The HRDC should facilitate the drawing up of a framework for managing relationships between council and the vice chancellor/ principal (executive management) which should cover at least the following: roles of council and vice chancellor/principal respectively, council approved constitution of executive management, performance appraisal systems for members of executive management, decision making powers of the vice chancellor/principal in cases of real emergency, regular communication between chairperson of council and the vice chancellor/ principal and between the council itself and the vice chancellor/principal, presentation of reports by vice chancellor/principal at council meetings.

ACADEMIC PLANNING FRAMEWORK

4

4.1 Rationale for Academic Planning

In Chapter 2, a comprehensive overview was presented of the linkages between higher education and development. It concluded with a very broad set of planning guidelines for Botswana if it indeed wished to make significant progress in moving towards a knowledge economy. In that chapter the importance of a systemic and cohesive approach to academic and enrolment planning was also stressed.

Before embarking on the development of an academic planning framework the rationale for such a framework as given in Chapter 2 is strengthened in this particular part of the report by focusing on some specific aspects against the background of the National Development Plan of Botswana's Government and the role which tertiary education is expected to play in the production of high level person power required to accelerate Botswana's progress towards a knowledge economy.

4.1.1 Botswana's National Development Plan

Botswana's most recent National Development Plan aims to move Botswana quite decisively from an economy largely dependent on mining and tourism to a more diversified and knowledge based economy. This new direction for Botswana's economy has been set against a backdrop of very high levels of unemployment even amongst those in possession of a tertiary education qualification. 15% of all unemployed persons hold tertiary education certificates while a further 22% of all unemployed persons hold post – secondary school certificates of some kind. These levels of highly skilled but unemployed persons are worrying and could in part be due to the fact that too many tertiary education students are being trained in academic areas which do not play a central role in strengthening Botswana's transition to a knowledge driven economy- the result of a mismatch between tertiary education graduate supply and that which is demanded by a changing economy.

Clearly, such an economic growth path will make very specific demands on the quantity and types of human capacity available to support such a transition. This directly affects the academic programmes through which such human capacity is produced.

Delivering human capacity in the fields required for the above economic transition will not simply happen by chance hence the need for a more systematised approach to academic planning in tertiary education. Neither will the unemployment rates of highly skilled human resources simply drop independently. Highly skilled but unemployed persons will have to be equipped with useful skills through relevant and responsive academic programmes. This requires a more systematised approach to academic planning.

4.1.2 Establishment of the Human Resource Development Council

In opposition to an approach as outlined above, it is often argued that tertiary education is characterised by academic freedom and institutional autonomy. Its character and direction, it is argued, should not be driven overly much by considerations of economic development as students who graduate, irrespective of their field, contribute to the overall stock of highly skilled human resources which is also needed for social and human development in the fields of culture, national cohesion, communication, identity, policy and social analysis, and diversified forms of human expression.

While this is clearly the case sufficient examples exist of a strong linkage between an emphasis on science (in its broader sense), engineering and technology and economic development in countries such as Japan and South Korea which as recently as 50 or 60 years ago were classed as developing economies and now represent some of the strongest and most advanced economies in the world.

Nevertheless, an academic planning approach should guard against emphasis that is too one sided and take into account the many and diversified needs of a developing economy and society such as Botswana. Certainly Botswana does not only need graduates in the 'hard sciences' but in the 'soft sciences' as well – it thus needs programmes in both these areas but in an acceptable proportion to one another.

In order to avoid the twofold pitfalls of simply allowing human resource development in Botswana to 'happen as it sees fit' through academic programmes instituted solely within a framework of institutional autonomy and academic freedom, and that of only concentrating on those academic programmes delivering the human capacity required by its economy, and in order to bring about a greater level of cohesion in Botswana's production of human resources, particularly in view of its new economic emphasis, the Government of Botswana recently approved the establishment of the Human Resource Development Council and the Botswana Qualification Authority.

It is foreseen that the Human Resources Development Plan which is to be developed by the HRDC will provide the tool through which the Ministry of Education and Skills Development, the HRDC and the individual education and training institutions will agree on supply side priorities, programme interventions and funding allocations. In doing so a collaborative integrated systems approach to human resource development planning that links together national policies and strategies, academic programmes and education and skills development, the labour market and the economy and different sectors of the economy and all relevant government ministries through the National Human Resource Development Plan is envisaged.

Clearly, the establishment of the HRDC with its wide ranging set of functions and responsibilities requires a more systematised approach to the offering of academic programmes by tertiary education institutions as one of its approaches towards achieving its goals.

4.1.3 Government Funding Constraints

Worldwide governments are under pressure in funding tertiary education institutions. This follows since annual cost increases in tertiary education are usually substantially higher than general education cost increases due to the labour intensive nature of providing tertiary education. In most countries, governments have sought to cope with these funding pressures by developing new funding frameworks which seek to emphasise an appropriate mix of inputs and outputs, requiring higher levels of efficiency and effectiveness from tertiary education institutions, increasing levels of public accountability requiring tertiary education institutions to become more responsive to the high level person power needs of their countries; and in most cases by introducing some form of user payment usually in the form of tuition fees.

Developing countries in particular have found that competing social demands linked to primary health care, basic education, services such as water and electricity, communication services etc. have resulted in very strong pressures being exerted on maintaining tertiary education funding levels. Botswana is no exception to these dynamics and a natural consequence of these pressures is to ask tertiary education institutions to respond more directly to national goals and imperatives than may have been the case in the past as the Government of Botswana seeks to balance the availability of resources with enrolling students into appropriate academic programmes.One way of achieving this balance is through a system of academic planning which seeks to match the ability of institutions to offer high quality tertiary education in more directly specified areas with society's needs of high level person power trained through these particular programmes.

4.1.4 Institutional Differentiation

As part of achieving the goal of delivering the human resource "capacity" required by a knowledge economy, Botswana has set itself a target of improving its gross tertiary education enrolment significantly above the approximately 15% at which it stands now. Achieving such an increased gross enrolment rate is not likely to happen without a significant expansion of the post-secondary schooling system in the form of establishing new and different tertiary education institutions such as BIUST but also ensuring that the existing tertiary education institutions stick to their broad academic mandates and do not seek to copy one another in their academic programme offerings.

Such institutional differentiation is best achieved through a system of academic planning in which institutions have to have any academic expansion plans approved by a body such as the HRDC first.

4.1.5 Summary

In addition to the broad rationale discussed in this report for the adoption of a system of institutional planning for tertiary education when analysing the linkages between tertiary education and development, this part of the report presents a further fourfold rationale for developing a system of academic planning, being:

- The changing human resource requirements associated with Botswana's National Development Plan in moving its economy to a knowledge driven economy;
- The associated establishment of a Human Resources Development Council with one of its main tasks being the development of a Human Resources Development Plan in support of such a knowledge economy;
- The need to match resources available for expenditure on public services with institutions offering a greater number of relevant and responsive academic programmes in the face of increasing competition between a number of social needs for Botswana; and
- The need for a diversified and differentiated tertiary education system in Botswana in which academic programme initiatives are managed in a systemic and cohesive manner.

4.2 Requirements for and Components of Academic Planning

Academic planning does not equate to centralised control and planning in which a body such as the HRDC, based on some analyses, assigns a set number of approved academic programmes to an institution. Academic planning represents a process by which an institution motivates why it regards its existing menu of academic programmes as appropriate to it and argues for the introduction of new academic programmes on the basis of its academic thrusts and strengths, its responses to new socio-economic development needs, and its staff and infrastructural capacities.

As part of this process, bilateral discussions between the HRDC and each institution eventually lead to a pact between the institution and Government (as represented by the HRDC on their Programme and Qualification Mix (PQM). A number of specific institutional requirements for academic planning are now presented.

4.2.1 Institutional Academic Thrusts

As knowledge based institutions, tertiary education institutions are defined first and foremost on the basis of their academic profile (teaching and learning, research, and community service) rather than on any other basis. This means that a tertiary institution's set of academic activities should display a satisfactory level of coherence while responding adequately to the requirements of a knowledge society as required by Botswana.

Such a simultaneous level of coherence and responsiveness is normally achieved through an institution developing a limited number of academic thrusts or academic focus areas which on a macro level would form a framework for its academic activities. Such thrusts are normally derived from, the institution's response to Government's goals and objectives as set out in its strategic plan, its existing academic strengths and weaknesses, and its reading of future knowledge developments and societal needs.

Examples of such academic focus areas could be thrusts such as:

- Health and wellness
- Culture, identity, communication and social cohesion
- Human development, citizenship and leadership, and governance
- Economic diversification and entrepreneurship
- Environmental systems and natural resources management
- Technological and infrastructural development

Such a framework of institutional thrusts should be used to guide the internal allocation of funds by giving preference to academic activities showing a clear link to one or more of these focus areas: the appointment of academic staff, the adjustment of existing academic programmes, the development of new academic programmes, the launching of research projects; and engaging in community service. Each tertiary education institution should thus be requested by the HRDC to develop a limited set of academic thrusts as an overall and guiding framework for its academic activities.

4.2.2 National Qualifications Framework

Countries that have sought to link higher education and development by responding with more responsive academic programmes have generally found this very difficult to do without a national qualifications framework. Such a national qualifications framework usually sets out the various qualification levels assigned to tertiary education by means of level descriptors which specify levels of learning in the form of learning outcomes associated with these qualification levels. In addition, such a national qualifications framework usually contains some criteria for the designation of qualification, major distinctive characteristics of qualifications, the relationship between various qualifications; as well as criteria for credit portability and articulation etc.

These qualification frameworks are normally indispensable in academic planning as well as in quality assurance systems. In addition, they play a very important role in communicating what qualifications represent to the general public and bring about a consistency of classification and understanding in this regard.

It is difficult to see how Botswana can implement an academic planning framework in a meaningful manner without having developed an accompanying national qualifications framework which is applicable to public as well as private tertiary education institutions.

4.2.3 A System for the Registration of Tertiary Education Institutions and for the of Academic Programmes

Apart from academic thrusts and a national qualifications framework, a system of academic planning should be supported by a functioning system of registering tertiary education institutions in terms of an applicable set of criteria and a functioning system of accrediting qualifications of institutions as part of a quality assurance system. Fortunately, Botswana has developed both an institutional registration system and a programme or qualification accreditation system, which apply to both public as well as private tertiary education institutions.

4.2.4 Categorisation of Knowledge Fields

Academic planning is meant to support the establishment of a greater measure of correspondence between graduate outputs of institutions and the needs for highly skilled person power of society. Achieving such improved correspondence is not possible without some or other system which classifies knowledge areas or subject areas. A variety of such knowledge classification systems exist; some of which are quite detailed and consist of up to 3 or 4 levels of classifications while others are more general consisting of more aggregated levels of classification.

All academic programmes should be able to be classified in a major knowledge field or two according to their main knowledge emphasis usually depicted through the major subjects of the qualification or programme.

As an example, the South African system of the classification of educational subject matter (CESM) consists of main fields or areas of knowledge. Each of these fields is subdivided into a number of sub fields. Apart from being an indispensable component of academic planning, such knowledge categorisation systems also play a crucial part in enrolment planning systems as well as funding systems which are aimed at steering tertiary education systems in desired directions associated with the person power needs of societies.

It is assumed that such a knowledge classification system is being developed as part of the establishment of a management information system for Botswana's tertiary education system. This would enable tertiary education institutions to draw up academic plans reflecting existing and intended academic programmes according to knowledge areas as well as according to learning levels as reflected in a national qualifications framework.

4.2.5 Management Information System (MIS)

An academic planning system also requires information on enrolments in existing academic programmes and anticipated enrolments in any envisaged academic programmes. This is not possible unless a system-wide management information system has been developed and implemented which defines concepts such as headcount student, FTE student, successful student, graduation rates, undergraduate and postgraduate, etc.

Such a system is being developed for Botswana's tertiary education system but implementing a functional academic planning system will require such a MIS to have been operative for at least 2-3 years and which contains as accurate data as is possible.

4.2.6 Templates for Academic Planning

A number of basic academic planning templates are required. The first template is an 'as is' presentation of formally accredited academic programmes offered by a tertiary education institution and together with the second template, forms the basis for approval of its initial PQM by the HRDC. The third template essentially covers which academic programmes an institution intends offering over the next 3 years. The fourth and fi fth templates represent national distributions of accredited academic programmes and national distributions of intended academic programmes over the next 3 years.

In some cases institutions in Botswana may have permission to operate on more than one campus. In such cases the templates given below should be amended somewhat and the data should be supplied per campus.

• Institutional distribution of formally accredited academic programmes for year n

The first template aims to distinguish between qualifications and programmes in respect of their NQF level of study i.e. certificate, diploma, undergraduate degree, postgraduate degree etc. and in respect of the knowledge field characterising the programme. One would expect a general university such as UB to cover more knowledge fields than would expect from a specialist institution such as the Botswana College of Accountancy. Likewise some institutions may concentrate on undergraduate study while others such as UB would be expected to concentrate on both these types of study.

Below is an example of a possible template for such an 'as is' analysis for Institution A in which, for illustrative purposes only, some assumptions have been made regarding possible qualifications as part of an NQF for Botswana. It is further assumed that this institution only operates in the following knowledge fields: 1, 4, and 6 of a knowledge classification system for Botswana's tertiary education system. Formally accredited programmes are indicated by an x in the appropriate cells of the template. Normally the first level of sub categorisation of the knowledge fields would be included in the table – these are indicated by a, b, c.

Table 2: Institutional distribution of existing formally accredited academic programmes according to qualification type and knowledge field for institution a for year n

Knowledge field	Certificate	Diploma	3 or 4 Year B degree	PG diploma	Honours	Masters	Doctoral
1							
a	x	x		x			
b							
c			x		x	x	x
4							
a			x				
b			x		x	x	x
6							
a	x	x	x	x			
b							

From the above template reflecting Institution A's formally accredited programmes it appears that it has no programmes accredited in Knowledge Field 6b while it has accredited doctoral programmes in only two knowledge fields being 1c and 4 a.

• Institutional distribution of existing non - accredited academic programmes for year n

The second template normally consists of programmes being offered by tertiary education institutions of which their formal accreditation status is unclear. In some cases institutions do not have any academic programmes falling into this category. The purpose of this template is to start of the academic planning exercise on a 'clean slate' consisting only of formally approved academic programmes. Institutions which have programmes not carrying a formal accreditation approval would, on the basis of their second template apply for formal accreditation for these programmes to the HRDC.

Table 3: Institutional distribution of existing academic programmes not formally accredited according to qualification type and knowledge field for Institution A for year n.

Knowledge field	Certificate	Diploma	3 or 4 Year B degree	PG diploma	Honours	Masters	Doctoral
1							
a b c	y						
4							
a b		y		y			
6							
a b	y	y					

In terms of this template Institution A in year n was offering a number of certificates, diplomas and a post graduate diploma for which formal accreditation had not been granted.

• Institutional distribution of intended academic programmes for year n+1, n+2, and n+3

The third template reflects intended new offerings over the next 3 years or so and requires a separate template for year n+1, n+2 and n+3.

Table 4: Institutional distribution of intended academic programmes for which formal PQM approval and there after accreditation approval is to be sought for Institution A for year n+1*

Knowledge field	Certificate	Diploma	3 or 4 Year B degree	PG diploma	Honours	Masters	Doctoral
1							
a b c						z	z
4							
a b					z	z	
6							
a b			z				

* Similar tables should be submitted for year n+2 and for year n+3

From it's table 4 inputs for year n+1 it seems as if Institution A is keen to strengthen it's post graduate programmes.

Each application for approval to offer a new programme must include the following motivation:

i. The intended programme's role in the production of human capacity required by the National Human Resource Plan;
ii. How the intended programme fits the institution's academic mandate as reflected in its academic thrusts;
iii. The anticipated enrolments for the first 3 years of the programme after its inception;
iv. The availability (or not) of academic staff and physical infrastructure, and if not available thecost in obtaining such capacity;
v. Consultation with stakeholders such as business/industry on the nature of and need for such a programme.

• National distribution of formally accredited academic programmes for year n

Once the HRDC has obtained the inputs in the form of the first two templates from each institution and the non-accredited programmes given in the second template have been considered it is in the position to establish a nationally applicable PQM distribution of formally accredited existing programmes according to qualification type and knowledge field. In the example given below it is assumed that Botswana's classification of knowledge fields will consist of 12 main categories.

Table 5: National distribution of formally accredited academic programmes offered by tertiary education institutions in Botswana for year n

Knowledge field	Certificate	Diploma	3 or 4 Year B degree	PG diploma	Honours	Masters	Doctoral
1							
a							
2							
a							
b							
12							
a							
b							

• National distribution of intended academic programmes by tertiary education institutions in Botswana for year n+1, n+2 and n+3

Table 6: National distribution of intended academic programmes to be offered by tertiary education institutions in Botswana for year n+1, n+2 and n+3.

Knowledge field	Certificate	Diploma	3 or 4 Year B degree	PG diploma	Honours	Masters	Doctoral
1							
a							
b							
2							
a							
b							
18							
a							
b							

From the data compiled in Table 5 the HRDC should be able to identify the need for certain types of qualifications in specific knowledge fields. This analysis is then matched against the distribution of intended academic programmes for year n+1, n+2 and n+3 given in Table 6 and from this matching the applications by the various institutions for approval to offer new academic programmes is then assessed.

4.3 Academic Planning Processes

In general the following should hold:

- Academic planning should be the outcome of consistent and healthy interaction between the HRDC and the various tertiary education institutions;
- In addition, it should simultaneously bear the characteristics of both a 'bottom-up' and a 'top-down' approach;
- Collective interactions between the HRDC and the institutions should be supplemented by interactions on a bi-lateral level between the HRDC and individual institutions; and
- A definite commitment by tertiary education institutions to play their part in Botswana's efforts to match its production of high level person power needs better with its human capacity needs.
- A workable sequence of submission of data by institutions and a commitment by the HRDC of supplying its national analyses timeously.

4.3.1 Collective interactions between the HRDC and tertiary education institutions

Clearly the development and initial implementation of an academic planning system will require concerted and planned interaction between the HRDC and the institutions on a collective level. This would have been helped greatly if the tertiary education institutions had already established some kind of body representing their collective interests. Nevertheless, in these interactions the HRDC should explain what the academic planning system is and what it is not, what its components are, what its inputs and outputs are expected to be, and how it is to be phased in.

These interactions should also give rise to the establishment of a national qualifications framework and a system for the classification of knowledge if the latter is not already included in the management information system which is being developed for tertiary education in Botswana.

Institutions in turn should have an opportunity to point out difficulties and challenges they would be facing in implementing the academic planning system. In this way they would be contributing to the improvement of the system and its role in the production of high level human resources for Botswana in terms of its national human resources development plan. Such collective interaction should occur frequently during the development of the system and at least annually once it has been formally implemented.

4.3.2 Being both a 'bottom-up' as well as a 'top-down' approach

Academic planning should continuously display the characteristic of being the outcome of both a bottom up as well as a top down process. The top down characteristic of academic planning follows that the overall national distribution for academic programmes has to be determined by a body such as the HRDC which has the requisite mandate to steer the graduate outputs of tertiary education towards greater synergy with national human resource needs.

The bottom-up characteristic of academic planning arises from the fact that an academic plan in which knowledge areas and academic programme gaps do not occur cannot be developed by the HRDC without analysing the distributions of existing academic programmes of the various institutions and more pertinently without the HRDC engaging each individual institution on a bi-lateral basis on its academic programmes before these are finalised. In these bi-lateral discussions individual institutions have an opportunity to point out specific institutional developments which may require amendments to any PQM approval decisions by the HRDC.

These interactions should also give rise to the establishment of a national qualifications framework and a system for the classification of knowledge if the latter is not already included in the management information system which is being developed for tertiary education in Botswana.

Institutions in turn should have an opportunity to point out difficulties and challenges they would be facing in implementing the academic planning system. In this way they would be contributing to the improvement of the system and its role in the production of high level human resources for Botswana in terms of its national human resources development plan. Such collective interaction should occur frequently during the development of the system and at least annually once it has been formally implemented.

4.3.2 Being both a 'bottom-up' as well as a 'top-down' approach

Academic planning should continuously display the characteristic of being the outcome of both a bottom up as well as a top down process. The top down characteristic of academic planning follows that the overall national distribution for academic programmes has to be determined by a body such as the HRDC which has the requisite mandate to steer the graduate outputs of tertiary education towards greater synergy with national human resource needs.

The bottom-up characteristic of academic planning arises from the fact that an academic plan in which knowledge areas and academic programme gaps do not occur cannot be developed by the HRDC without analysing the distributions of existing academic programmes of the various institutions and more pertinently without the HRDC engaging each individual institution on a bi-lateral basis on its academic programmes before these are finalised. In these bi-lateral discussions individual institutions have an opportunity to point out specific institutional developments which may require amendments to any PQM approval decisions by the HRDC.

4.3.3 Tertiary education's role in meeting Botswana's national human capacity requirements

The world over tertiary education does not always enjoy unfettered confidence from Government and industry in particular in respect of its commitment to assist in meeting national human resource needs. Many still view tertiary education as a system consisting of 'ivory towers' and feel that public institutions in particular make little effort in improving their levels of responsiveness regarding specific human resource requirements. In this way a perception often exists that tertiary education institutions do not see that they have a primary role to play in solving the problem of a mismatch between their graduate outputs and the human capacity needs of society and industry in particular.

Introducing a system of academic planning in Botswana would go a long way in dispelling these perceptions and in strengthening the collaboration between the Botswana Government, tertiary education and business/industry in the interests of Botswana's socio-economic growth.

4.3.4 Workable sequence of provision of data by institutions and by the HRDC

The proposed academic planning framework requires some tables to be completed by each tertiary education institution to which the HRDC should respond with the compilation of some national tables of data. The dates for each year by which institutions should submit each of their tables should be determined in consultations between the HRDC and the tertiary education sector collectively. The submission of Table 2 (academic programmes for which accreditation approval was not given but which are nevertheless offered) should normally only occur once. Similarly the dates by which the HRDC would release the two sets of national distributions of academic programmes reflected in Tables 5 and 6 should also be determined in these consultations with the tertiary education sector.

In addition, the HRDC should commit itself to ensuring that each tertiary education institution would be informed annually of its finally approved PQM by a certain date in order to allow tertiary education institutions some space to initiate the required academic planning responses etc.

4.4 Summary

The rationale for developing an academic planning framework was partly developed in the analysis of the relationship between tertiary education and development as mentioned earlier; but is more specifically made up of the following sub points:

- The changing human resource requirements associated with Botswana's National Development Plan in moving its economy to a knowledge driven economy;
- The associated establishment of a Human Resource Development Council with one of its main tasks being the development of Human Resources Development Plan in support of such a knowledge economy;
- The need to match resources available for expenditure on public services with public institutions in particular, offering a greater number of relevant and responsive academic programmes in the face of increasing competition between a number of social needs for Botswana; and
- The need for a diversified and differentiated tertiary education system in Botswana in which academic programme initiatives are in accordance with the main academic mandates of the various institutions.

In order to establish a functional academic planning approach which has value for tertiary education institutions as well as for macro oriented structures such as the HRDC the following components of such a system have to be in place:

- Each institution must have an approved set of academic focus areas which correspond to its academic mandate;
- Botswana must have a national qualifications framework in place with a tertiary education qualifications framework as a subset;
- A working system of registering tertiary education institutions and accrediting academic programmes must be in place;
- A system for the classification of fields of study or areas of knowledge must be in place for tertiary education; and
- A working management information system which ensures conformity of terminology and of definitions must be in place and must have produced usable data for at least the past 2-3 years.

In addition to the above requirements being met, the components of the envisaged academic planning framework consist of the following data sets:

- A distribution of existing, formally accredited academic programmes; according to qualification type and knowledge field for each tertiary education institution;
- A distribution of existing academic programmes not formally accredited according to qualification type and knowledge field for each tertiary education institution;
- A distribution of intended academic programmes for which formal PQM approval and there after accreditation approval is to be sought for each tertiary education institution for year n+1, n+2 and n+3;
- A national distribution of formally accredited academic programmes offered by public and private tertiary education institutions in Botswana for year n; and
- A national distribution of intended academic programmes to be offered by public and private tertiary education institutions in Botswana for year n+1, n+2 and n+3.

Academic planning in essence is the outcome of regular and planned interactions between the HRDC and the various tertiary education institutions The existence of such a body would do much to facilitate such interactions. These interactions define academic planning as a process having the following characteristics:

- Academic planning should be the outcome of consistent and healthy interaction between the HRDC and the various public and private tertiary education institutions;
- In addition it should simultaneously bear the characteristics of both a 'bottom-up' and a 'top-down' approach;
- Collective interactions between the HRDC and the institutions should be supplemented by interactions on a bi-lateral level between the HRDC and individual institutions; and
- An undisputed commitment by tertiary education institutions to play their part in Botswana's efforts to match its production of high level person power needs better with its human capacity needs.
- A workable sequence of submission of data by institutions and a commitment by the HRDC of supplying its national analyses timeously.

ENROLMENT PLANNING FRAMEWORK

5

5.1 Rationale for enrolment planning

5.1.1 Botswana's National Development Plan

As pointed out before, Botswana's most recent National Development Plan aims to move Botswana quite decisively from an economy largely dependent on mining and tourism to a more diversified and knowledge based economy.

As stressed before, delivering the human capacity required for the above economic transition will not simply happen by chance. There is hence a need for a more systematised approach to student enrolments in tertiary education. The unemployment rates of highly skilled person power will not simply drop in and of themselves. These highly skilled but unemployed persons will have to be equipped with useful skills required by Botswana's economic development plans; and efforts will have to be made to see that new graduates do not end up in the same position. Achieving this therefore requires a more systematised approach to student enrolments.

5.1.2 Establishment of the Human Resources Development Council

It has already been shown that the Bill through which the HRDC is to be established emphasizes that its planning functions would include the development of the National Human Resource Development Plan while its advisory functions would include the provision of advice to Government through the Minister of Education and Skills Development on human resource development policy.

In addition, it is foreseen that the Human Resources Development Plan will provide the tools through which the Ministry of Education and Skills Development, the HRDC and the individual education and training institutions will agree on supply side priorities, programme interventions and funding allocations. In doing so, a collaborative integrated systems approach to human resource development planning that links together national policies and strategies; education and skills development; the labour market; the economy and different sectors of the economy; and all relevant government ministries through the National Human Resource Development Plan is envisaged.

Clearly, the establishment of the HRDC with its wide ranging set of functions and responsibilities, particularly that of developing a national Human Resource Plan requires a more systematised approach to tertiary education enrolments as one of its approaches towards achieving its goals.

5.1.3 Improving Botswana's tertiary education participation rate

Botswana has set itself the challenge of improving its gross enrolment rate for tertiary education appreciably. The gross enrolment rate (GER) is defined as the total number of tertiary education enrolments divided by the number of 20-24 year olds in a country's population.

In achieving higher GER levels, Botswana's tertiary education sector should seek to improve its enrolments substantially. This aim can be supported in a number of ways:

- Decreasing the number of undergraduate students studying abroad – particularly in South Africa in favour of students studying at institutions in Botswana;
- Establishing an expanded post-secondary education system by establishing new and more specialised tertiary education institutions such as the Botswana International University of Science and Technology; and
- Embarking on a more systematized approach to tertiary education enrolments through, for example, enrolment planning which seeks to match increased enrolments better with available institutional.

As in the previous instances higher GERs levels are not simply going to happen in and of themselves but require particular policy interventions such as enrolment planning which would support a gradual and systematic increase in GERs throughout the tertiary education system.

5.1.4 Government funding constraints

In the part of the report covering academic planning it was pointed out that worldwide governments are under pressure in funding tertiary education institutions. The reasons for this, particularly in the case of developing countries, were given in that part of the report. As pointed out there, Botswana is no exception to these dynamics and a natural consequence of these pressures is to ask tertiary education institutions to respond more directly to national goals and imperatives than may have been the case in the past as the Government of Botswana seeks to balance the availability of resources with student enrolments. One way of achieving this balance is through a system of enrolment planning.

5.1.5 Improving student throughput rates

Although not a direct aim of enrolment planning systems, improving student throughput rates forms an important secondary goal of enrolment planning. This aspect assumes a particular importance in systems experiencing low throughput rates and where human resources demands of growing economies and public funding constraints necessitate higher levels of throughput in the form of successfully graduating students.

5.1.6 Monitoring tertiary education's contribution to the production of high level human resources

Establishing an enrolment planning system provides the necessary mechanism for the HRDC to start monitoring the contribution of tertiary education to the production of high level human resources as required by Botswana's moving towards a knowledge-driven economy. Progress in reaching targets set; for example, for the proportion of undergraduate versus post graduate enrolments, or for the proportion of enrolments in the broad humanities compared to Science; English and Technology, compared to the business sciences, could be monitored annually and form the basis for any policy interventions that may be deemed necessary.

In particular, building up a longer term set of enrolment data would enable the HRDC to perform some trend analyses in the production of human resources and in conjunction with the various tertiary education institutions devise any appropriate responses to the outcomes of these trend analyses.

5.1.7 Summary

In this section of the report a six fold rationale for developing a system of enrolment planning was set out:

1. The changing human resource requirements associated with Botswana's National Development Plan in moving its economy to a knowledge driven economy;
2. The associated establishment of a Human Resources Development Council with one of its main tasks being the development of a Human Resources Development Plan in support of such a knowledge economy;
3. The aim of increasing Botswana's overall GER for tertiary education and particularly for the public tertiary education sector;
4. The need to match resources available for expenditure on public services with tertiary education enrolments in the face of increasing competition between a number of social needs for Botswana;
5. Improving student throughput rates in line with the demands for an increased supply of high level person power; and
6. Monitoring tertiary education's contribution to the production of high level human resources with a view to increasing tertiary education's levels of responsiveness.

5.2 Requirements for and Components of Enrolment Planning

Enrolment planning represents a process by which an institution motivates its anticipated growth in student numbers (usually in 3 year periods) on the basis of its academic strengths, its past enrolment patterns, its responses to new development imperatives, and its staff and infrastructural capacities.

5.2.1 Institutional academic plans

Enrolment planning and academic planning go hand in hand and cannot be separated from one another. In fact an institution's enrolment plan should be based on its academic plan. Although some argue that one cannot separate these two sequentially, strictly speaking an institution's academic plan should precede its enrolment plan. This follows due to mainly two reasons:

- As knowledge based institutions, tertiary education institutions are defined first and foremost on the basis of their academic profile (teaching and learning, research, and community service) rather than on the basis of their student numbers; and
- Although students enrol for study at an institution they do so for study in a specific academic programme. This means that an institution's programme profile is the determining factor in its enrolment profile.

5.2.2 Data from a national management information system and from derived institutional management information systems

An enrolment plan cannot be developed in any meaningful sense by an institution unless it has access to accurate enrolment information for at least the three years preceding the first year for which the enrolment plan is being drawn up. This data has to be available in the format agreed on between the HRDC and the tertiary education sector and would normally be arranged according to knowledge field, programme type and programme level.

Similarly the HRDC cannot assess institutional enrolment plans in isolation but has to do so against an aggregated national enrolment plan. This can only be done if all the institutions can supply the requisite data to the HRDC on a regular basis in an agreed format.

In some tertiary education systems, more detailed enrolment data is required where enrolments, for example, have to be presented according to gender. This is usually the case when socio-political goals such as improving women enrolments are pursued. Since the cost of presenting face to face tertiary education programmes and distance (and open learning) programmes normally differ significantly from one another, enrolment plans usually distinguish between modes of delivery as well. This is suggested for tertiary education in Botswana.

5.2.3 Uniformity of definitions

Enrolment planning requires a uniformity of definitions of all relevant measures and variables. These definitions normally are part and parcel of the national management information system. These definitions would include the following:

Student headcounts, student full time equivalents, approved academic programme, distance education, contact (face to face) education, qualification types, graduations, graduation rates, student drop outs, enrolment census dates, full time equivalent academic staff, degree credits and /or successful students, grouping of knowledge fields in broader categories, etc.

Usually enrolment planning is also used to assess the efficiency and effectiveness of tertiary education institutions through evaluating throughputs and success rates. This is particularly the case when institutions apply for approval to offer new academic programmes. This can be done in two ways.

One way is simply to calculate the pass or success rate of the subjects or modules on offer in the institution. While valuable, doing so does not provide one with an overall picture of graduates becoming available for functioning in Botswana's economy. To obtain such a picture in any accurate way requires tracking an entering group of students in year n and seeing how many graduated in say year n+3 or n+4.

An alternative for such group studies is to define the graduation rate for year "n" as the total number of graduations in year n divided by the total number of enrolments for year "n". Thus the graduation rate for all three year degree programmes would be the total number of graduations for such programmes in year "n" divided by the total number of enrolments in three year degree programmes for year "n".Obviously this definition has limitations but it does provide some indications of throughput rates and would allow the HRDC in consultation with the tertiary education sector to set some normative graduation rates for say three year degree programmes, four year degree programmes etc and monitor the progress of the system towards these normative graduation rates.

The availability of data for the measures listed earlier would allow the HRDC to perform a number of analyses on a regular basis such as analysing changes in student headcount and student FTE ratios, analysing academic staff and student ratios etc. It is assumed that these definitions are being developed as part of the development of a management information system for tertiary education in Botswana.

5.2.4 Actual national student enrolments for the year n-3, n-2, and n-1

Aggregate national student enrolments for the year's n-3, n-2 and n-1 are used in developing enrolment targets for the years n, n+1, and n+2. Depending on the availability of data, enrolment data for year n-1 is sometimes not available when the enrolment targets are set for year n, n+1, and n+2 which imply that historical data of actual enrolments for year n-4, n-3 and n-2 must be used.

Table 7: Aggregated actual student enrolments for tertiary education institutions for year n-3, n-2, and n-1.

Headcount and FTE enrolments by qualification type	Actual year n-3 Head FTE Count	Actual year n-2 Head FTE Count	Actual year n-1 Head FTE count	Average annual increase
UG diplomas				
UG degrees				
Intermediate PG				
Masters and doctoral				
TOTAL				
Headcount enrolments by major field				
SET				
Business and management				
Humanities and education				
TOTAL				
Student outputs				
Average success rates				
Graduation rate				
Total Graduates				

Apart from actual headcount and FTE data Table 1 would normally also contain proportional distributions expressed as % of totals.

5.2.5 Aggregated student enrolment targets for tertiary education for year n, n+1, and n+2

The next component of the enrolment planning framework consists of developing a set of national student enrolment targets. These are based on the following:

- An analysis of actual enrolments for the Botswana tertiary education system for year's n-3, n-2, and n-1 as given in Table 1.
- Enrolment increases required to improve Botswana's overall GER;
- Enrolments according to broad knowledge field and according to level and type of qualifications in accordance with anticipated human capacity needs related to the National Human Resources Development Plan or the National Development Plan while the former is being finalised;
- Increased enrolments anticipated because of the introduction of new academic programmes in some institutions; and
- An analysis of the infrastructural capacity of the tertiary education system available for teaching and learning.

Table 8: Student enrolment targets for tertiary education institutions for year n, n+1, and n+2.

Headcount and FTE enrolments by qualification type	Target for year n Head FTE Count	Target for year n+1 Head FTE Count	Target for year n+2 Head FTE count	Average annual increase
UG diplomas				
UG degrees				
Intermediate PG				
Masters and doctoral				
TOTAL				
Headcount enrolments by major field				
SET				
Business and management				
Humanities and education				
TOTAL				
Student outputs				
Average success rates				
Graduation rate				
Total Graduates				

Apart from actual headcount and FTE data Table 8 would normally also contain proportional distributions expressed as % of totals.

5.2.6 Actual student enrolments for individual institutions for year n-3, n-2, and n-1

In the table below actual enrolments for each tertiary education for the various tertiary education institutions in Botswana are given. Obviously specialist institutions will not have entries in all the various rows of the table, particularly those reflecting the various fields of study.

Table 9: Actual student enrolments for tertiary education institutions for year n-3, n-2, and n-1

Headcount and FTE enrolments by qualification type	Actual year n-3 Head FTE Count	Actual year n-2 Head FTE Count	Actual year n-1 Head FTE count	Average annual increase
UG diplomas				
UG degrees				
Intermediate PG				
Masters and doctoral				
TOTAL				
Headcount enrolments by major field				
SET				
Business and management				
Humanities and education				
TOTAL				
Student outputs				
Average success rates				
Graduation rate				
Total Graduates				

Apart from actual headcount and FTE data Table 9 would normally also contain proportional distributions expressed as % of totals.

5.2.7 Student enrolment targets for individual institutions for year n, n+1, and n+2

In Table 10, student enrolment targets for each individual tertiary education institution are given. As before not every institution will have entries in each of the rows of the table. The processes through which these targets are arrived at are described more fully in chapter of the report.

The other factors mentioned earlier also play a crucial role in determining enrolment targets for individual institutions. These factors are:

- An analysis of actual enrolments for the institution for years n-3, n-2, and n-1 as given in Table 9
- Enrolment increases required to improve Botswana's overall GER;
- Enrolments according to broad knowledge field and according to level and type and type of qualifications in accordance with anticipated human capacity needs related to the National Human Resources Development Plan or the National Development Plan while the former is being finalised;
- Increased enrolments anticipated because of the introduction of new academic programmes in some institutions; and
- The infrastructural capacity available for teaching and learning within the institution.

Table 10: Student enrolment targets for individual tertiary education institutions for year n, n+1, and n+2.

Headcount and FTE enrolments by qualification type	Target year n Head FTE Count	Target year n+1 Head FTE Count	Target year n+2 Head FTE count	Average annual increase
UG diplomas				
UG degrees				
Intermediate PG				
Masters and doctoral				
TOTAL				
Headcount enrolments by major field				
SET				
Business and management				
Humanities and education				
TOTAL				
Student outputs				
Average success rates				
Graduation rate				
Total Graduates				

Apart from actual headcount and FTE data Table 10 would normally also contain proportional distributions expressed as % of totals.

5.2.8 Over and under enrolments

While an institutional enrolment planning framework is a valuable instrument in improving institutional planning and in lining up the graduate outputs of tertiary education better with national human resource needs, institutions, despite their best efforts usually either have over or under enrolments in terms of their targets. These over and under enrolments mainly arise from the fact that in developing countries in particular, the practice of students applying in advance for admission to tertiary education institutions is often not an established practice. This means that in such cases institutions have to contend with the phenomenon of 'walk-in' students i e students who simply arrive at the institution unannounced and who in fact do qualify for admission. Clearly the larger the number of 'walk ins' the more difficult it is to remain on course in terms of set enrolment targets.

In order to make enrolment planning meaningful on both the institutional as well as the national level it will be necessary that public tertiary institutions, in particular, gradually introduce systems requiring students to apply for admission for year n sometime towards the end of year n-1. While the introduction of applying for admission for tertiary education study should diminish the number of 'walk-ins' drastically, experience has shown that this is seldom entirely possible. Some 'walk in' cases having real merit usually still occur and institutions should be given the right of discretion on admitting such students in such cases.

One way of approaching this challenge is to develop over and under enrolment bands for each institution. These bands should be based on an analysis of their past experiences in terms of admitting students who applied formally and those who simply 'walked in'. These bands could be fairly generous at the inception of enrolment planning for tertiary education and thereafter be made narrower gradually as institutions improve their own institutional planning capacities.

Another way of approaching this matter in the case of public tertiary education institutions is for the block grant (or discretionary) funding allocations of institutions to be determined on the basis of their targeted student enrolments. In the case of under enrolments institutions are then 'over' funded and in the case of over enrolments institutions are theoretically 'under' funded.

The question then is whether one should penalise public institutions with under enrolments in year n by subtracting a claw back amount in say year n+2. But should one expect the institutions with over enrolments to carry the cost of the excess students? This approach is usually kept as a last resort and only utilised in cases where institutions over a period of say 2-3 years have not been able to demonstrate an ability to bring their actual enrolments into the bands allowed for them.

If this approach is accepted, over and under enrolments falling within the band allowed for the individual institutions are tolerated while over and under enrolments falling outside the band allowed for each institution are treated on an individual basis in the sense that institutions that display consistent under enrolments beyond the band limits allowed for under enrolments for more than 2-3 years usually have their enrolment targets adjusted downwards and in the case of public institutions thus their funding allocations as well.

The student enrolments thus 'freed up' are then allocated to other institutions who have clearly demonstrated that they are able to enrol more students than their targets allow them and that these additional enrolments are needed in order to meet Botswana's high level human resources requirements. Institutions that display consistent over enrolments beyond the band limits allowed for over enrolments for more than 2-3 years are then expected to carry the cost of any excess students themselves.

Some countries have found that while the above measures proved helpful they were not sufficient to resolve the problem of significant variations between targeted and actual enrolments. In some cases this has resulted in the establishment of central applications offices and some countries have gone even further by establishing central admissions offices as well. Obviously this is a very complex and difficult matter to resolve and would certainly require much consultation between the HRDC and the tertiary education sector.

5.2.9 Summary

In this part of the report the main requirements and components of an enrolment planning approach for tertiary education in Botswana have been presented.

Introducing an enrolment planning system requires a national tertiary education information system to have been developed and for data for at least 2-3 years to be available for all tertiary education institutions in terms of this management information system.

The components of an enrolment planning system as given earlier can be adjusted to suit the requirements of a body such as the HRDC by adding information on more variables such as women enrolments or first time entering enrolments. The approach in this report has been to make the information requirements as simple as possible and no provision has been made for such additional information to be included.

The components of the enrolment planning system are as follows:

- A set of national enrolment targets for year n, n+1, and n+2 according to qualification levels, qualification types, and knowledge fields; and
- A set of individual institutional enrolment targets for year n, n+1, and n+2 according to qualification levels, qualification types, and knowledge fields.

These sets of enrolment targets are based on:

- An analysis of actual enrolments for the tertiary education institutions for years n-3, n-2, and n-1;
- Enrolment increases required to improve Botswana's overall GER;

- Enrolments according to broad knowledge field and according to level and type and type of qualifications in accordance with anticipated human capacity needs related to the National Human Resources Development Plan or the National Development Plan while the former is being finalised;
- Increased enrolments anticipated because of the introduction of new academic programmes in some institutions; and
- The infrastructural capacity available for teaching and learning within the various institutions.

Introducing a system of enrolment planning normally requires institutions to introduce the practice of admission of students based on formal applications as a means of reducing the number of 'walk-in' students i. e. students who arrive at the institution unannounced.

In addition, it requires mechanisms for treating consistent over and under enrolments by institutions. The best way of doing this is to establish a reasonable band of over and under enrolments for each institution and obviously for the system as a whole. Institutions displaying consistent under enrolments, after a period of 'grace' have their enrolment targets reduced and any 'freed up' places are allocated to institutions having over enrolments. Institutions displaying consistent over enrolments are required after a period of 'grace' to accept responsibility for the excess cost of the over enrolled students themselves.

5.3 Enrolment Planning Processes

In this part of the Report, the processes involved in setting up an effective enrolment planning system for tertiary education in Botswana are described. In general, the following should hold:

- Enrolment planning should be the outcome of consistent and healthy interaction between the HRDC and the various tertiary education institutions;
- In addition it should simultaneously bear the characteristics of both a 'bottom-up' and a 'top-down' approach;
- Collective interactions between the HRDC and the institutions should be supplemented by interactions on a bilateral level between the HRDC and individual institutions;
- A commitment by tertiary education institutions to play a constructive role in Botswana's efforts to match its production of high level person power needs better with its human capacity needs as required for establishing its economy as a knowledge economy; and
- A workable schedule of dates and timelines applicable to institutions for the submission of their enrolment data and to the HRDC for supplying its nationally aggregated analyses and individual institutional responses.

As these characteristics are very similar to those already described in this report, when developing an academic planning framework, they are not repeated here again.

5.4 Summary: Enrolment Planning Framework

In this report, a framework for enrolment planning has been established for tertiary education institutions in Botswana. The reasons for introducing such a system are mainly the following:

- The changing human resource requirements associated with Botswana's National Development Plan in moving its economy to a knowledge driven economy;
- The associated establishment of a Human Resources Development Council with one of its main tasks being the development of Human Resources Development Plan in support of such a knowledge economy;
- The aim of increasing Botswana's overall GER for tertiary education and particularly for the public tertiary education sector;
- The need to match resources available for expenditure on public services with tertiary education enrolments in the face of increasing competition between a number of social needs for Botswana.
- Improving student throughput rates in line with the demands for an increased supply of high level person power; and
- Monitoring tertiary education's contribution to the production of high level person power with a view to increasing tertiary education's levels of responsiveness.

The main elements of an enrolment planning approach for public tertiary education in Botswana are:

- A set of national enrolment targets for year n, n+1, and n+2 according to qualification levels, qualification types, and knowledge fields; and

- A set of individual institutional enrolment targets for year n, n+1, and n+2 according to qualification levels, qualification types, and knowledge fields.

These sets of enrolment figures are based on:

- An analysis of actual enrolments for tertiary education institutions for years n-3, n-2, and n-1;
- Enrolment increases required to improve Botswana's overall GER;
- Enrolments according to broad knowledge field and according to level and type and type of qualifications in accordance with anticipated human capacity needs related to the National Human Resources Development Plan or the National Development Plan while the former is being finalised;
- Increased enrolments anticipated because of the introduction of new academic programmes in some institutions; and
- The infrastructural capacity available for teaching and learning within the various institutions.

Introducing a system of enrolment planning normally requires institutions to introduce the practice of admission of students based on formal applications as a means of reducing the number of 'walk-in' students i.e. students who arrive at the institution unannounced.

In addition, it requires mechanisms for treating consistent over and under enrolments by institutions. The best way of doing this is to establish a reasonable band of over and under enrolments for each institution and obviously for the system as a whole. Institutions displaying consistent under enrolments, after a period of 'grace' have their enrolment targets reduced and any 'freed up' places are allocated to institutions having over enrolments. Institutions displaying consistent over enrolments are required after a period of 'grace' to accept responsibility for the excess cost of the over enrolled students themselves.

Enrolment planning should, in addition, bear the following characteristics:

- Enrolment planning should be the outcome of consistent and healthy interaction between the HRDC and the various tertiary education institutions;
- It should simultaneously bear the characteristics of both a 'bottom-up' and a 'top-down' approach;
- Collective interactions between the HRDC and the institutions should be supplemented by interactions on a bilateral level between the HRDC and individual institutions; and
- A commitment by tertiary education institutions to play a constructive role in Botswana's efforts to match its production of high level person power needs better with its human capacity needs as required for establishing its economy as a knowledge economy.
- A workable schedule of dates and timelines applicable to institutions for the submission of their enrolment data and to the HRDC for supplying its nationally aggregated analyses and individual institutional responses.

Typically, introducing a system of enrolment planning for Botswana's tertiary education system would entail the following steps:

- Establishment and implementation of a tertiary education management information system containing the information required for enrolment planning.
- Reaching agreement with the tertiary education sector on the various aspects of the enrolment planning system and on the issues to be covered in a trial run.
- Conducting a trial run in which institutions supply their actual enrolments for years n-3, n-2 and n-1 and the HRDC uses these together with other relevant information to set up national enrolment targets for years n, n+1, and n+2.
- Using the national enrolment targets and the actual enrolment data for the various institutions, the HRDC then develops a set of individual institutional enrolment targets as part of the trial run for discussion with each institution
- Once these discussions have been concluded and the trial run has been completed the system is refined through further consultation between the HRDC and the tertiary education sector.
- The enrolment planning system is launched formally and is reviewed each year through an annual consultative session between the HRDC and the tertiary education sector.

Finally, enrolment planning represents an opportunity for:

- Tertiary education institutions to improve their levels of effectiveness and efficiency, specifically with regard to enrolment planning;
- Tertiary education institutions to demonstrate their commitment to play a constructive role in assisting in meeting the human capacity needs of Botswana in its quest to become a knowledge driven economy;
- Government to pro-actively provide leadership and direction in respect of the country's human resource needs and its ability to meet these needs;
- Government to establish strong partnerships with tertiary education institutions by establishing strong processes of interaction and consultation with tertiary education institutions in developing enrolment targets; and
- The HRDC to monitor tertiary education's contribution to Botswana's human capacity needs and introduce any required steering of tertiary education outputs.

INFRASTRUCTURE PLANNING FRAMEWORK

6

The infrastructure planning framework depends on the preceding two frameworks, namely an academic planning framework and an enrolment planning framework. This follows since the infrastructure planning framework is largely driven by FTE student numbers, which in turn arise from the other two planning frameworks.

6.1 Rationale for Infrastructure Planning

Given the Technical complexities and high level human capacity required to develop, implement, and sustain an infrastructure planning framework a compelling rationale for developing such a planning approach for tertiary education in Botswana should exist before the HRDC embarks on such a route.

Very advanced infrastructure planning systems distinguish between infrastructure in the form of buildings and infrastructure in the form of the provision of basic services on land such as roads, storm drainage, lighting etc. For simplicity's sake in this report only buildings are included in infrastructure planning.

In addition, some infrastructure planning approaches distinguish between the provision of new buildings and the maintenance of existing buildings. In this report, it is assumed that the provision for the maintenance of buildings forms part of the annual Government allocations for running costs and this report thus concentrates on the provision of new buildings only.

6.1.1 Assessment of existing provision of infrastructure

In many developing countries in particular, the provision of new buildings for tertiary education occurred on a fairly ad hoc basis largely determined by the availability of funds and the amount of leverage a tertiary education institution could muster to sway decision makers. In such systems, a fairly accurate assessment of over or under provision of buildings for educational purposes is usually not available.

The first rationale for developing an infrastructure planning framework is thus that of determining whether the system as a whole is under or over provided with building space and within the system which institutions are over or under provided. It is of course entirely possible that certain types of building space may be under provided such as student residence space while other forms of space such as for administration may be overprovided for. These assessments are normally carried out as the first step of developing an infrastructure planning framework. The results of such an assessment are then used by Government to guide the future provision of funding for new infrastructure where institutions suffering building backlogs are given preference while institutions which have building space surpluses are expected to work away their surpluses before they qualify for any funds for new infrastructure again.

6.1.2 Ensuring greater consistency in the amount and quality of building space provided

The absence of a regulating set of space and cost norms for buildings usually leads to unacceptably large variations in the size and quality of buildings erected on campuses of tertiary education institutions. In addition the absence of such space and cost norms can easily lead to institutions grossly over paying for what they are getting. Introducing an infrastructure planning framework thus brings about greater consistency in the size and quality of new buildings for tertiary education purposes as well as providing a valuable guideline to Government and to institutions on realistic costs associated with new buildings.

6.1.3 Providing for variations in building requirements due to functional usage

Tertiary education institutions require buildings for a number of purposes which are often inter-related. They for example require lecture halls, libraries, laboratories, administration buildings, residences etc. The space and costs associated with these different functional uses vary considerably and a differentiated set of space and cost norms provides a fair way of ensuring consistency within such variation.

6.2 Requirements For and Components of Infrastructure Planning

As mentioned before, a framework for infrastructure planning requires a number of quite advanced building space and building cost measures to be in place. In this chapter extensive use is made of such measures developed by the Department of Higher Education and Training (DHET) in South Africa which in turn were based on similar measures developed by the National Centre for Education Statistics in the USA.

6.2.1 Tertiary education programme classification system

A tertiary education programme classification system classifies the various functions and activities of tertiary education institutions into a number of programmes where a programme represents a related set of functions. These programme classification systems differ from country to country but an example is the one currently in use in South Africa which distinguishes between 11 programmes being:

1. Instruction service	5. Research	9. Community
2. Academic support	6. Student services	10. Institutional support
3. Operation and maintenance of plant	7. Bursaries	11. Auxiliary enterprises
4. Hospitals	8. Independent operations	

Descriptions of the functions and activities typically included in each of the above programmes, in South Africa's case, are contained in a separate policy document entitled: Programme Classification Structure Manual: South African Post-Secondary Education System 002 of 1982.

6.2.2 Classification of knowledge

The main characteristics of a system for the classification of knowledge were discussed earlier, as part of the development of an academic planning framework. This classification system is also required as part of an enrolment planning framework, as well as for an infrastructure planning framework.

6.2.3 Building and space classification system

Similar to academic planning, which is based among other things on a knowledge classification system, the infrastructure of academic planning requires that a building and space classification system be in place. This classification system should be developed within the context of Botswana's tertiary education system but its main elements are not expected to be too different from the classification system developed for South African higher education by DHET. The various facets of such a system can be categorised as follows:

- **Buildings to be included /excluded**

Apart from a formal definition of what constitutes a building and what does not, for the purposes of the inventory of existing building space, the classification system should make it clear which buildings are included and which are excluded. Normally only buildings under the direct control and ownership of the council of the institution and which are directly related to the performance of the institution's tertiary education mandate are included. The definition of a building requires it to be attached to a foundation and to be serviced by utilities such as electrical services and plumbing services etc.

• Measuring building space

Building space is usually measured in square metres and the gross building space consists of three elements:

a. Assignable space which refers to space which can be assigned to a specific occupant or user of the building for their use. It is measured within the interior walls of the structure and the usage normally falls into one (or more) of the following categories: Classrooms, laboratories, offices, study areas, special use space, general use areas, support rooms, health care rooms, residential space and unclassified space. These categories will be described in more detail later.
b. Non-assignable space represents space which is essential to the operation of the building but which cannot be assigned directly to people for use. Once again its area is measured within its interior walls. Such space normally is associated with building services, circulation services, mechanical services such as lifts etc.
c. Structural space which represents the space upon which the exterior and interior walls sit.

These spaces are usually determined from building plans or through physical measurement.

• Rooms to be included/excluded

Sometimes rooms are used for multiple purposes and the main purpose (or at most two main purposes) should be identified in respect of its functional usage.

• Number of stations

A station is normally defined as the total facilities provided to accommodate one person during one time period – normally the reporting year. The term workstation is often used as a synonym for station and, for example, in a classroom with a number of loose desks and chairs, each set of a chair and a desk would constitute a station for the use of one student during the time period. Similar considerations apply to study space in a library, or a computer laboratory where a computer is assigned to each station of a student. The concept of a station is normally only applied to assignable space.

• Space categories

All assignable space should be categorised into one of the eleven specific space use categories listed in Section 17.1, supra. The code 1 at the beginning of each 4 digit code indicates 'assignable space'. Non-assignable areas are designated with the digit 2 as the first digit of the four digit code for space types. The second digit reflects one of the 10 space categories listed below with classroom facilities being '1', laboratory facilities '2' etc. The final two digits are used to designate more specific space categories. The 10 categories for assignable space are:

1100 Classroom facilities	1200 Laboratory facilities
1300 Office facilities	1400 Study facilities
1500 Special use facilities	1600 General use facilities
1700 Support facilities	1800 Health care facilities
1900 Residential facilities	1000 Unclassified facilities

Examples of some of the sub classifications of space within the 10 main categories are

1300 Office facilities	1310 Office
1315 Office service	1350 Conference room
1355 Conference room service	

Each of these types of sub spaces is described in more detail such as:

1310: Office service is defined as a space that directly serves an office or group of offices as an extension of the activities in office spaces. This could include file rooms, kitchenettes, copy and fax rooms, vaults etc.

1355: Conference room service is similarly defined as space that directly serves one or more conference spaces as an extension of the activities in those spaces. This could include kitchenettes, storage spaces, telecommunication and projection control booths, etc.

The first and second order space categories used in the South African infrastructure planning framework are given in Annexure D as an example of such a classification. Clearly developing such a space classification system for Botswana's tertiary education system has to be conducted in conjunction with facility managers in the various tertiary education institutions. Nevertheless examples of such classification systems such as those used in South Africa could be very helpful and could reduce the amount of work involved considerably.

6.2.4 Space and cost norms for buildings

An infrastructure planning system can only serve its intended purposes if it is based on a consistently applied set of rules or norms which enable intra and inter institutional comparisons to be made. In this part of the report some suggestions are made in respect of developing such a set of space and cost norms for buildings.

A set of space and cost norms should meet the following characteristics:

- Be tailored for Botswana's tertiary education environment;
- Be functional in the sense of being as simple as possible while nevertheless serving their intended purposes;
- Make provision for both face to face and open distance modes of learning; and
- Not be so prescriptive as to remove any room for legitimate institutional differences.

One of the very first decisions to be made when developing space and cost norms for buildings concerns the level of detail which is to be taken into account. Space and cost norms are influenced among other by the area of knowledge in which academic activities take place and by the study level of these academic activities. In this regard some argue that even if one were to disregard the factor of study level as introducing unnecessary complexities into an infrastructure planning system one should include differences arising from the knowledge field for which space and cost norms are developed as in general buildings for the 'soft sciences' are much less expensive to build and maintain than those for the 'hard sciences'.

The first aspect to be clarified in developing space and cost norms for buildings is the relationship between the programmes (sets of functions and activities) and the types of assignable space. This relationship spells out for which programme-space type combination provision is made for the development of space and cost norms and for which programme-space type combination no provision for developing space and cost norms is made. For example, in the case of South Africa, provision for the development of building space and cost norms is only made for the following programme-space type combinations:

Programme

1. Instruction:	Classrooms, Open laboratories, and Offices
2. Research:	Research laboratories
4. Academic Support:	Offices, Study facilities, Special and General Use
5. Student Services:	Offices, Special and General Use, and Health Care
6. Institutional Support:	Offices, and Special and General Use
7. Operation of Plant:	Offices, and Special and General Use
9. Auxiliary Enterprises:	Offices, Special and General Use, and Residences

From the above, it follows that in South Africa's case, no provision is made for any space and cost norms for the following programmes in higher education:

3. Community Service
8. Bursaries
10. Hospitals
11. Independent Operations

In order to cut down on the time taken to develop such a set of space and cost norms for Botswana's tertiary education system, one approach which could be considered would be accepting the above approach adopted by South Africa as a starting point and amending it where necessary.

• Space norms for buildings

In order to manage the provision of space for the programmes allowed for this purpose a number of definitions are required. By way of an example the definitions covering class rooms for the Instruction Programme are given:

Assignable square metres (ASM) classroom space per FTE enrolled student in a particular knowledge classification category should be used as the standard space norm for classroom facilities.

These standard space norms in turn depend on the following three concepts:

1. **ASM classroom space per classroom station (A):** The ASM per classroom station used in different infrastructure planning systems tends to vary somewhat but 1, 5 sq. m is usually seen as a reasonable amount of space for one station.

2. **Annual utilisation hours per classroom station (U):** This measures the number of hours per annum that a classroom station (usually a seat) can be realistically utilised. This value is determined by the number of hours a classroom can realistically be occupied as well as the average percentage of the classroom that is occupied at a given time.

For example, assuming a classroom usage of 30 weeks and of 40 hours per week yields 1200 hours of usage per annum. If an average utilisation of classroom stations of 50% is assumed a U value of 600 is obtained.

Obviously efforts to achieve higher U values should be supported. In some countries the following ways have been considered:

- Doing away with claims by individual academic departments that certain spaces belong to them and to no one else in favour of institutional ownership of space;
- Introducing a centralised system of booking of classroom space to optimise the use of classrooms;
- Increasing the number of weeks of formal instruction and the number of hours per day during which teaching activities take place; and
- Introducing systems whereby academic departments 'rent' classroom space via a centrally controlled rental system.

3. **Annual classroom contact hours (C) per knowledge category:** These values would differ between knowledge fields where formal face to face teaching is the dominant mode of educational delivery and knowledge fields where this is not the case.

In the infrastructure planning system used in South Africa, the values for C (the classroom contact hours per annum) vary from 280 for fields such as Public Management, to 560 for Engineering. The ASM classroom space per FTE student of a particular knowledge field is then expressed as: A x C/U.

For example, in the South African infrastructure planning framework an application of the values of A=1,5, U= 540 and C=500, yields an ASM classroom value of 1,389 per FTE student for the Mathematical Sciences. Similar calculations lead to ASM per FTE student values of 1,028 for the Agricultural Sciences and of 0,778 for Public Management.

The above examples concern classroom space only – similar calculations for open laboratory space and for offices would then yield the total ASM per FTE student in a particular knowledge field for the Programme: Instruction.

Similarly ASM values can then be calculated per FTE student for each of the other space categories and for the programmes recognised to be supported by means of a space and cost norms approach although different parameters than A, U or C are used in some cases.

Clearly calculating the total space which an institution should have in terms of such norms is an arduous but very necessary task if the Botswana tertiary education system is to determine which institution is underprovided in terms of space and which institution is overprovided in terms of space.

Given the extremely technical nature of establishing such norms much could be gained if the HRDC agreed to take the South African planning infrastructure norms as a starting point and sought to simplify them as seen fit.

• Cost norms for buildings

As was the case in developing space norms for buildings, developing cost norms is also highly technical in nature and requires a number of concepts to be defined in order to establish a generally applicable set of cost norms. Although infrastructure planning systems differ from country to country the South African infrastructure planning system's set of cost norms will once again be used as an example.

Building cost unit: First it is required to define a building cost unit. In South Africa's case it is defined to be the current rand equivalent of R3065 on 15 June 1995, the latter amount being escalated by the University of Stellenbosch's Bureau of Economic Research's Building Cost Index in their annual report on building costs. The building cost index on 15 June 1995 is taken to be 152.4 using 1990 as a base year.

Rather than developing cost norms from first principles as was done for space norms, moving from space norms to cost norms is normally accomplished by simply converting applicable ASM values to cost units by means of suitable conversion factors. An example of such a set of conversion factors for the Programme is given at Annexure E for a knowledge classification system consisting of 22 fields. Similarly, a set of conversion factors can be used for the calculation of building cost units from ASM values for the other programmes.

The procedure for converting standard space norms to standard cost norms can be summarised as:

Standard cost norm = Standard value of cost unit per ASM x Standard space norm.

Adopting this procedure then yields building cost norms per FTE student. For example, for the knowledge field agriculture, the Instruction Programme and for classrooms, this procedure yields a cost norm of 1,542 whereas for engineering it yields a cost norm of 2,331 and for education one of 1,500. This would mean that if equally sized buildings were to be planned for each of these three areas the classroom space of engineering would cost more than a similar amount of classroom space for agriculture, which in turn would cost slightly more than a similar amount of classroom space for education.

Once the cost units per FTE student is determined, the number of FTE students in a particular knowledge field(s) and the value of the building cost unit are known, the building cost of a building, say for the Management Sciences or for the Physical Sciences can be calculated.

Apart from being of value in estimating the cost of a new building, these space and cost norms are also of great value in calculating the replacement value of existing buildings for insurance purposes.

Although complex, the development of all the above Technical underpinnings together with an institution's distribution of FTE students across knowledge categories, allows one to obtain a picture of the assignable square metres of space such an institution is entitled to as well as the associated building cost units for each knowledge category, for its teaching activities.

Similarly, one can obtain a picture of the assignable square metres of space such an institution is entitled to as well as the associated building cost units for each programme (set of related activities) and its sub programmes if one wished to do so.

Two examples from the South African application of its infrastructure planning framework are provided for illustrative purposes. These examples are based on a fictitious institution having a total of 15 104, FTE students in contact education and 1 887, in open distance learning. In this case a knowledge classification consisting of 22 categories has been used although the South African CESM system has since been amended to consist of 20 knowledge categories only. The first example gives the total building space and building cost provision across knowledge categories for the Programme: Instruction only.

Table 11: Example 1: Total building space and building cost provisions for a fictitious higher education institution within the Instruction Programme

CESM category	Total ASM	Total cost units
01 Agriculture	1 824	2 725
02 Architecture and Environmental Design	4 386	4 761
03 Arts, Visual and Performing		
3A Music	912	1 432
3B History of Visual Arts	371	428
3C All other Arts, Visual and Performing	235	263
04 Business, Commerce and Management Sciences	8 298	10 435
05 Communication	622	755
06 Computer Science and Data Processing	5 056	5 897
07 Education	2 329	2 781
08 Engineering and Engineering Technology	5 702	6 622
09 Health Care and Health Sciences		
09A Nursing, Rehabilitation and Therapy, etc.	1 306	1 523
09B All other Health Care and Health Sciences	2 473	3 728
10 Home Economics	276	339
11 Industrial Arts, Trades and Technology	759	732
12 Languages, Linguistics and Literature	2 008	2 428
13 Law	3 149	3 989
14 Libraries and Museums	7	8
15 Life Sciences and Physical Sciences	3 993	6 149
16 Mathematical Sciences	1 809	2 307
17 Military Sciences	0	0
18 Philosophy, Religion and Theology	116	141
19 Physical Education, Health Education and Leisure	652	751
20 Psychology	1 571	1 933
21 Public Administration and Social Services	911	1 095
22 Social Sciences and Social Studies	3 348	3 995
TOTAL	**52 112**	**65 217**

The value of its buildings used directly in the Programme: Instruction can then be obtained by multiplying the number of cost units i.e. 65 217 by the value of the building cost unit at that particular time. In addition the ASM value of 52 112 for its teaching activities to which this institution is entitled can then be compared to its actual teaching related ASM and an assessment of building space shortages or surpluses can be made. These calculations of shortages and surpluses can be made on an overall institutional level or within each knowledge category thus enabling institutional management to determine which knowledge areas are most in need of additional space and which have too much space in terms of the norms. Although not always possible, such analyses can then lead to building space trade-offs within an institution in order to establish greater levels of consistency in space allocation before new buildings are planned. The second example details the building space and cost provision across the various institutional programmes.

Table 12: Example 2: Total space and cost provision for a fictitious higher education institution according to programme/sub-programme

Programme/sub-programme	Total ASM	Total cost units
1.0 Instruction	52 112	65 217
2.0 Research	12 140	20 638
4.0 Academic Support		
4.1 Library Services	24 261	26 527
4.2 Museum Services	1 189	1 189
4.3 Educational Media Services	1 286	1 453
4.4 Academic Computing Support	1 029	1 527
4.5 Ancillary Support	7 690	7 690
4.6 Academic Administration	1 605	1 605
4.7 Course and Curriculum Development	76	76
4.8 Academic Personnel Development	76	76
5.0 Student Services		
5.1 Student Services Administration	121	121
5.2 Social and Cultural Development	14 946	14 946
5.3 Counselling and Career Guidance	302	302
5.4 Student Health Services	242	242
6.0 Institutional Support		
6.1 Executive Management	967	1 128
6.2 Financial Administration	814	814
6.3 Financial Aid Administration	302	302
6.4 General Administration and Logistical Services	9 457	7 333
6.5 Student Admissions, Records and Examination	491	491
6.6 Administrative Computing Support	729	949
6.7 Public Relations/Fund- Raising	510	510
6.8 Staff Social and Cultural Development	227	227
7.0 Operation and Maintenance of Plant	4 654	4 025
9.0 Auxiliary Enterprises		
9.1 Student Housing Services	35 670	36 914
9.2 Student Food Services	4 333	4 116
9.3 Staff Housing Services	3 059	3 212
9.4 Other Food Services	5 869	5 575
9.5 Other Auxiliary Enterprises	693	659
9.6 Operation and Maintenance of Plant for Aux. Ent	351	310
TOTAL FOR BUILDINGS	**185 199**	**208 174**

The value of the analysis given above is, for example, that the ASM value for student housing can play a particularly important part in determining the extent of residence backlogs.

6.2.5 Summary

Clearly the development of an infrastructure planning framework is a highly technical and very complex endeavour requiring the following subsystems to be in place:

- Tertiary education programme classification system
- A system for the classification of knowledge
- Building and space classification system

- **Space and cost norms for buildings**

The development, implementation and maintenance of such a system are likely to pose very serious human capacity challenges to the HRDC as well as to the individual institutions.

The role of these subsystems in establishing an infrastructure planning framework was demonstrated by using South Africa's infrastructure planning framework as an example.

The knowledge classification system is also an ingredient of the academic planning and enrolment planning frameworks. Two options exist regarding its use in the infrastructure planning framework.

Option 1: Using it in exactly the same format as for the other two planning frameworks. Obviously this option has to be the first choice as it would bring about the necessary cohesion between these three planning frameworks. It would furthermore ensure that all institutional data collection is in terms of the same knowledge classification system which would simplify data reporting formats and software development considerably.

Option 2: Use it in an abridged or summarised manner in infrastructure planning. This approach would mean that certain of the original knowledge classifications are grouped together to form a more aggregated knowledge field such as SET or Business and Management. While simplifying the technical complexities of calculating space backlogs or surpluses considerably such an approach does have its disadvantages particularly when it comes to estimating the costs of a new building via the now aggregated cost norms. For example, a decision on a new building for engineering will now be based on space and cost calculations for SET as a whole resulting in the loss of valuable differentiated information.

Unfortunately, it does not make sense to use the abridged version of the knowledge classification system when calculating space provision and the expanded one when calculating costs of new buildings as the conversion tables used in moving from space norms to cost norms rely on the same underlying knowledge classification.

Another approach could be to argue for a general reduction in the number of knowledge areas provided for in the knowledge classification system so as to use a somewhat simplified system in all three planning frameworks. In this approach instead of working with a knowledge system of say 20 categories one tries to scale this down to say 12 or so.

6.3 Infrastructure Planning Processes

Infrastructure planning will require a significant initial investment in time and energy from the HRDC and the various tertiary education institutions. Given its highly technical nature, training and the development of the required institutional capacity by the HRDC will be of paramount importance.

Step 1: The first step in the infrastructure planning process will be for the HRDC to develop a Botswana version of the DHET in South Africa's Building and Space Inventory and Classification Manual. This will require some decisions to be taken on the following matters:

- The knowledge classification system to be used;
- The programmes to be recognised for infrastructure planning purposes;
- The types of space to be recognised for infrastructure planning purposes; and
- Clarity on a number of definitions and concepts such as assignable space, non-assignable space, structural space, space stations, different types of space etc.

Step 2: The second step consists of developing a set of space norms for the various programmes, types of space and knowledge groupings. Once this has been done institutions can start building up a theoretical space inventory in terms of their student FTE distribution across knowledge categories. This can then be compared to their existing space allocation and the HRDC could assess which institutions experience building surpluses or backlogs. It is of course entirely possible that an institution may have a surplus of teaching space but a backlog of residential space, for example.

The HRDC then summarises all these inventories of space and compiles a report on building space backlogs and surpluses. The results of compiling such inventories are then used to guide any future allocations of funds for new buildings where as a rule, institutions that suffer from building space backlogs receive preferential treatment in the awarding of such allocations until such time as these backlogs have been worked away.

Such building backlog and surplus studies are not normally conducted every year or even periodically but are usually carried out every 10 years or so, as once building space backlogs have been worked away and once building space surpluses have been eroded through growth in student numbers, the allocation of infrastructural funds can proceed from a position of 'even playing fields'. What is obviously required is to keep the playing fields even; and hence the checking of this every 10 years or so.

Step 3: The third step consists of the development of a set of building cost norms which serve as a guide for compiling realistic estimates of the anticipated costs of new buildings. These estimates serve as guideline for the allocation of funds for any approved new building projects and form an important part of the information on which final building tenders are awarded.

6.4 Summary: Infrastructure Planning Framework

The development of an infrastructure planning framework arguably represents the greatest challenge to the HRDC of all the planning frameworks thus far presented in this report. Infrastructure planning requires the development of highly complex and extremely technical underpinnings which normally pose significant human capacity challenges on both the system and the institutional levels. Due to these challenges, the rationale and the advantages to be obtained from introducing such a system must be very persuasive indeed. Furthermore, every effort should be made to keep such an infrastructure planning system as simple as possible while still retaining its value in tertiary education planning and decision making. Finally, a reasonable assurance must exist that the desired human capacity to drive such a planning approach on the national level as well as on the institutional level exists and can be maintained. Infrastructure planning is necessary for the following reasons:

- It enables an assessment of the existing provision of infrastructure to be made and in so doing to determine which institutions are suffering from building space backlogs and which are experiencing building space surpluses. This assessment is normally also the springboard for introducing higher levels of efficiency in the utilisation of space by institutions;

- It enables greater consistency in the amount and quality of building space provided for tertiary education to be achieved while at the same time yielding reliable estimates of the likely costs of new buildings in terms of generally applicable space and cost norms. These estimates play a crucial role in Government approval for new building ventures and in the final tender decisions;
- Depending on the level of detail included in the infrastructure planning framework, it normally provides for accommodating variations in building requirements due to functional usage. This is particularly important for tertiary institutions which require building space for a large number of different functions all related to their main educational mandate; and
- Finally, together with the academic and enrolment planning frameworks it establishes a coherent basis for decision making as new buildings are hardly likely to be approved for an institution in an academic area which does not feature prominently in its academic planning and for which enrolment increases are expected to be very moderate.

As mentioned before, the development of an infrastructure planning framework is a highly technical and very complex endeavour requiring the following subsystems to be in place:

- Tertiary education programme classification system
- A system for the classification of knowledge
- Building and space classification system
- Space and cost norms for buildings

The knowledge classification system is also an ingredient of the academic planning and enrolment planning frameworks and is a determining factor in the level of sophistication of the eventual infrastructure planning framework. Two options exist regarding its use in the infrastructure planning framework.

Option 1: Using it in exactly the same format as for the other two planning frameworks. Obviously this option has to be the first choice as it would bring about the necessary cohesion between these three planning frameworks.

Option 2: Use it in an abridged or summarised manner in infrastructure planning. This approach would mean that certain of the original knowledge classifications are grouped together to form a more aggregated knowledge field such as SET or Business and Management. While simplifying the Technical complexities of calculating space over – or under provision considerably, such an approach does have its disadvantages particularly when it comes to estimating the costs of a new building via the now aggregated cost norms. For example, a decision on a new building for engineering will now be based on space and cost calculations for SET as a whole resulting in the loss of valuable differentiated information.

Another approach could be to argue for a general reduction in the number of knowledge areas provided for in the knowledge classification system so as to use a somewhat simplified system in all three planning frameworks. In this approach, instead of working with a knowledge system of say 20 categories, one tries to scale this down to say 12 or so.

The development of an infrastructure planning framework requires the following three steps:

Step 1: The first step in the infrastructure planning process will be for the HRDC to develop a Building and Space Inventory and Classification Manual. This will require some decisions to be taken on the following matters:

- The knowledge classification system to be used;
- The programmes to be recognised for infrastructure planning purposes;
- The types of spaces to be recognised for infrastructure planning purposes and whether space sub types are to be entertained or not; and
- Clarity on a number of definitions and concepts such as assignable space, non-assignable space, structural space, space stations, different types of space etc.

Step 2: The second step consists of developing a set of space norms for the various programmes, types of space and knowledge groupings. Once this has been done, institutions can start building up a theoretical space inventory in terms of their student FTE distribution across knowledge categories. This can then be compared to their existing space allocation and the HRDC could assess which institutions are over or under provided with building space. It is of course entirely possible that an institution may have an over provision of teaching space but an under provision of residential space.

The HRDC then summarises all these inventories of space and compiles a report on building space backlogs and surpluses.

Step 3: The third step consists of the development of a set of building cost norms which serve as a guide for compiling realistic estimates of the anticipated costs of new buildings. These estimates serve as guideline for the allocation of funds for any approved new building projects and form an important part of the information on which final building tenders are awarded.

In view of the complex and time consuming nature of developing an infrastructure planning framework for Botswana from first principles it is strongly recommended that the HRDC considers using an adapted form of the South African infrastructure planning framework as a starting point. Once this planning framework has been established and the desired human capacity developed to maintain and improve the system some refinements can be brought about.

ANNEXURE A
HIGHER EDUCATION AND ECONOMIC DEVELOPMENT INDICATORS

Country	Stage of development (2009-2010)[1]	Quality of education system ranking(2009-2010)[2]	Gross tertiary education enrolment rate (2008)	Overall global competitiveness ranking(2010-2011)[2]
Ghana	Stage 1: Factor-driven	71	6.2[5]	114
Kenya		32	4.1[6]	106
Mozambique		81	1.5[3]	131
Tanzania		99	1.5[5]	113
Uganda		72	3.7	118
Botswana	Transition from 1 to 2	48	7.6 (20)[4]	76
Mauritius	Stage 2: Efficiency-driven	50	25.9	55
South Africa		130	15.4[4]	54
Finland	Stage 3: Innovation-driven	6	94.4	7
South Korea		57	98.1	22
United States		26	82.9	4

Notes:

[1] Income thresholds (GDP per capita in USD) for establishing stages of development (WEF 2010: 10): Stage 1 Factor-driven: <2 000; Transition from stage 1 to stage 2: 2 000-3 000; Stage 2 Efficiency-driven: 3 000-9 000; Transition from stage 2 to stage 3: 9 000-17 000; Stage 3 Innovation-driven: >17 000.

[2] Ranked out of 139 countries.

[3] 2005 figure.

[4] 2006 figure. The 2010 figure by the Botswana Tertairy Education Council is over 20% while in South Africa the figure remained around 16%.

[5] 2007 figure.

[6] 2009 figure.

ANNEXURE B

ACADEMIC CORE INDICATORS: RATINGS PER UNIVERSITY

	INPUT INDICATORS					OUTPUT INDICATORS		
PERIOD	Average for 2001–2007			2007 only		Average for 2001–2007		
INDICATOR	% SET enrolments	% Masters and doctoral enrolments	Student-staff ratios	% Academics with doctoral degrees	Research income / permanent academic (ppp$)	SET graduation rate	Doctoral graduates as % of permanent academics	Ratio of research publications / permanent academic
RATING	Strong: >39% Medium: 30–39% Weak: <30%	Strong: >9% Medium: 5–9% Weak: <5%	Strong: <20 Medium: 20–30 Weak: >30	Strong: >49% Medium: 30–49% Weak: <30%	Strong: >20 000 Medium: 10 000–20 000 Weak: <10 000	Strong: >20% Medium: 17–20% Weak: <17%	Strong: >10% Medium: 5–10% Weak: <5%	Strong: >0.5 Medium: 0.25–0.5 Weak: <0.25
Cape Town	41%	19%	13	58%	47 700	21%	15.00%	0.95
Botswana	22%	5%	15	20%	2 000	20%	0.66%	0.11
Dar es Salaam	40%	9%	14	50%	6 400	19%	2.18%	0.08
Eduardo Mondlane	54%	2%	10	19%	2 000	6%	0.00%	0.03
Ghana	19%	7%	22	47%	3 400	16%	0.17%	0.11
Makerere	24%	5%	16	32%	4 900	20%	1.63%	0.09
Mauritius	48%	13%	17	45%	3 000	26%	2.80%	0.13
Nairobi	31%	16%	14	71%	5 300	14%	1.87%	0.09
NMMU	25%	6%	30	34%	12 300	15%	5.50%	0.31

Key:

Strong	Medium	Weak

ANNEXURE C

OVERVIEW ON SPACE USE CATEGORIES (ASSIGNABLE AREA - Code 1 in front)

1100 Classroom Facilities
1110 Classroom
1115 Classroom Service
1200 Laboratory Facilities
1210 Class Laboratory
1215 Class Laboratory Service
1220 Open Laboratory
1225 Open Laboratory Service
1250 Research/Non-class Laboratory
1255 Research/Non-class Laboratory Service
1300 Office Facilities
1310 Office
1315 Office Service
1350 Conference Room
1355 Conference Room Service
1400 Study Facilities
1410 Study Space
1420 Stack
1430 Open-Stack Study Space
1440 Processing Space
1455 Study Service
1500 Special Use Facilities
1520 Sports/Physical Recreation
1523 Sports Spectator Seating
1525 Sports/Physical Recreation Service
1530 Media Production
1535 Media Production Service
1540 Clinic (Non-health Professions)
1545 Clinic Service (Non-health Professions)
1570 Animal Facilities
1575 Animal Facilities Service
1580 Greenhouse
1585 Greenhouse Service
1590 Other (All Purpose)
1600 General Use Facilities
1610 Assembly
1615 Assembly Service
1620 Exhibition
1625 Exhibition Service
1630 Food Facility
1635 Food Facility Service 1050 Inactive Area
1640 Day Care 1060 Alteration or Conversion Area
1645 Day Care Service 1070 Unfinished Area

General Use Facilities (cont)
1650 Lounge
1655 Lounge Service
1660 Merchandising
1665 Merchandising Service
1670 Recreation
1675 Recreation Service
1680 Meeting Room
1685 Meeting Room Service
1690 Locker Space
1700 Support Facilities
1710 Central Computer and Telecommunications
1715 Central Computer and Telecommunications Services
1720 Workshop
1725 Workshop Service
1730 Central Storage
1735 Central Storage Service
1740 Vehicle Storage
1745 Vehicle Storage Service
1750 Central Service
1755 Central Service Support
1760 Hazardous Materials Storage
1770 Hazardous Waste Storage
1800 Health Care Facilities
1810 Patient Bedroom
1820 Patient Bath
1830 Nurse Station
1840 Surgery
1850 Treatment/Examination Clinic
1860 Diagnostic Service Laboratory
1890 Staff On-Call Facility
1900 Residential Facilities
1910 Sleep/Study without Toilet/Bath
1919 Toilet/Bath
1920 Sleep/Study with Toilet/Bath
1935 Sleep/Study Service
1950 Apartment
1955 Apartment Service
1970 House
1000 Unclassified Facilities

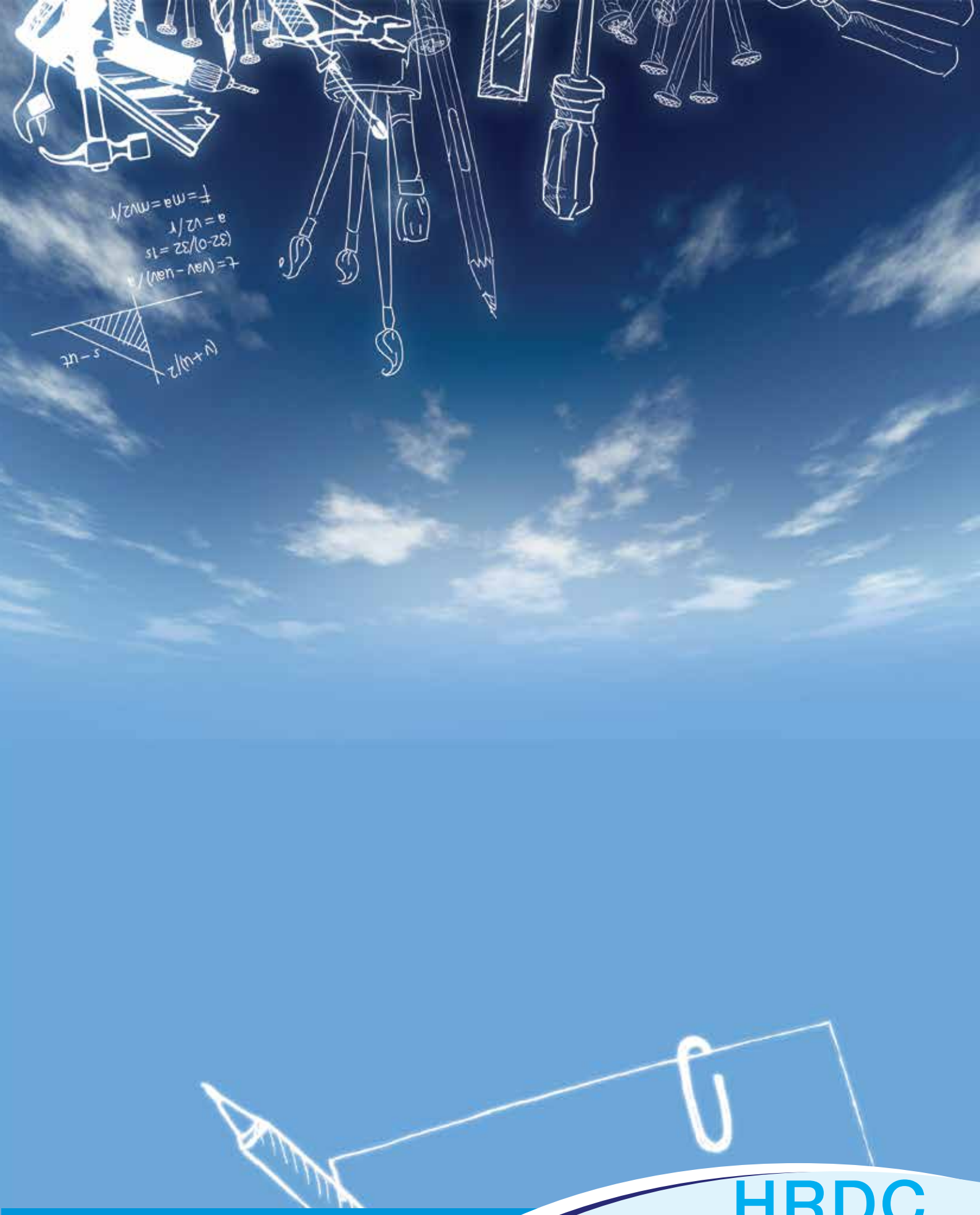
ANNEXURE D

BUILDING COST UNITS PER ASM FOR CONTACT AND DISTANCE TUITION AT HIGHER EDUCATION INSTITUTIONS FORMAL INSTRUCTION PROGRAMME ACCORDING TO CESM AND SPACE USE CATEGORY.

Space use Category	Classroom	Class/Open Laboratory	Office
CESM category			
01 Agriculture	1.5	1.75	1.00
02 Architecture	1.5	1.00	1.00
03 Arts, Visual and Performing			
3A Music	1.5	1.75	1.00
3B History of Visual Arts	1.5		1.00
3C All other Arts, Visual and Performing	1.5	1.10	1.00
04 Business, Commerce and Management	1.5	1.00	1.00
05 Communication	1.5	1.05	1.00
06 Computer Science and Data Processing	1.5	1.10	1.00
07 Education	1.5	1.10	1.00
08 Engineering and Engineering Technology	1.5	1.10	1.00
09 Health Care and Health Sciences			
09A Nursing, Rehabilitation and Therapy, etc	1.5	1.10	1.00
09B All other Health Care and Health Sciences	1.5	1.75	1.00
10 Home Economics	1.5	1.25	1.00
11 Industrial Arts, Trades and Technology	1.5	0.90	1.00
12 Languages, Linguistics and Literature	1.5	1.05	1.00
13 Law	1.5	1.00	1.00
14 Libraries and Museums	1.5	1.00	1.00
15 Life Sciences and Physical Sciences	1.5	1.75	1.00
16 Mathematical Sciences	1.5	1.00	1.00
17 Military Sciences	1.5	1.00	1.00
18 Philosophy, Religion and Theology	1.5	1.00	1.00
19 Physical Education and Health Education	1.5	1.10	1.00
20 Psychology	1.5	1.15	1.00
21 Public Administration and Social Services	1.5	1.00	1.00
22 Social Sciences and Social Studies	1.5	1.00	1.00

BIBLIOGRAPHY

1. Centre for Higher Education Management: Human and Financial Resources Best Practices Handbook. 2001. Cape Town
2. Centre for Higher Education Management: Guide to Meeting Procedures for Universities and Technikons. 2003. Cape Town.
3. Centre for Higher Education Transformation: Effective Governance (DJ Ncayiyana and FM Hayward). 1999. Cape Town.
4. Centre for Higher Education Transformation: Guide to Meeting Procedures for Universities and Technikons. 2003. Cape Town.
5. Centre for Higher Education Transformation. Higher Education and Research Advocacy Network in Africa. Linking Higher Education and Economic Development. (P Pillay). 2010. Cape Town.
6. Centre for Higher Education Transformation. Higher Education and Research Advocacy Network in Africa. Universities and economic development in Africa: Synthesis and key case study findings. (N Cloete, T Bailey, P Maassen). 2011. Cape Town.
7. Council on Higher Education: Academic Freedom, Institutional Autonomy and Public Accountability in Higher Education: A Framework for analysis of state-sector relationship in democratic South Africa (R Jonathan). 2006. Pretoria.
8. Department of Higher Education and Training: Programme Classification Structure Manual: South African Post-Secondary Education System 002. 1982. Pretoria
9. Department of Higher Education and Training: The Higher Education Qualifications Framework. 2007. Pretoria.
10. Department of Higher Education and Training: Classification of Educational Subject Matter. 2008. Pretoria.
11. Department of Higher Education and Training: Building and Space Inventory and Classification Manual. 2009. Pretoria
12. Department of Higher Education and Training: Space and Cost Norms for Buildings and Other Land Improvements at Higher Education Institutions. 2009. Pretoria
13. Government of Botswana: Tertiary Education Act. Gaborone.
14. Government of Botswana: University of Botswana Act 2008. Gaborone.
15. Ministry of Education and Skills Development: Towards a Knowledge Society: Tertiary Education Policy- Government White Paper Number 37. 2008. Gaborone.
16. Ministry of Education and Skills Development: National Human Resources Development Strategy: Realising our Potential. 2009. Gaborone.
17. Ministry of Education and Skills Development: Driving the Transformation Agenda: Tertiary Education Strategy 2009-2016. 2010. Gaborone.
18. Ministry of Finance and Development Planning and Ministry of Education: Realising our Potentials.2007. Gaborone.



HRDC

HUMAN RESOURCE DEVELOPMENT COUNCIL

For more information contact:

Plot 60113, Block 7, Gaborone, Private Bag BR 108, Gaborone, Botswana
Telephone: +267 3930741 Fax: +267 3930740
Email: marketingcomms@hrdc.org.bw, **Website: www.hrdc.org.bw**

HRDCbw | HRDCbw | HRDCbw