SELF-EVALUATION REPORT

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Foreword by the chairman

It is a good thing to take some time to investigate if the course you are following is still pointing towards the direction you set out. It is a good thing to find out if the travelling companions are still on board, and that they are keeping up. It is a good thing to see if the results achieved are real and tangible and of a high standard. Every five years, Belgium Campus iTversity organises a self-evaluation and an international benchmark exercise to find out if the evolution of the institution is reflecting the development in education, research and development and community engagement we are aiming for.

It is part of our quality management and PDCA cycle, to find out if we are still on course, recognise the trends that will lead to new changes, and find out if we are able to offer what is needed, in form, content and delivery. The benchmarking is done in cooperation with strategic international partners. While we are fully engaged to live up to the realities and demands in South Africa, and align our operations accordingly, we need to establish the fact that we reach international standards. After all, BC iTversity as an academic institution connects the local to the global.

An international quality benchmark for us is to find out if we are still true to our values, our vision and mission, expressed in the specific goals we have set. We look at how we are doing things, our processes, to see if the interaction of our creating of form, content and delivery is a valid method of developing a curriculum that allows us to reach our goals in teaching and learning, research and development, and empowering and engaging people and communities. Lastly, we want to scrutinise what we are actually doing, we look at our products and see if they live up to South African and international expectations of the stakeholders.

Outsiders must recognise and understand that first and foremost, BC iTversity is a South African institution. BC iTversity was established in the hopeful days after apartheid had been abolished, in the halcyon days when the country was redefining itself as the rainbow nation. BC iTversity did not carry any baggage from the past at all, and so we could freely introduce our vision and methods. That has proven to be a major asset. We developed a keen understanding of what was living in society and industry, academia and science, here, but because of our international outlook also elsewhere. This has been a strong advantage. When we arrived on the scene we found a country that was reinventing itself, in full and almost permanent transition, battling with the old, and at the same time getting ready for the new changes and challenges the 21st century is throwing at us. More than other countries South Africa is a land in transition, and we must not forget that and the landscape is constantly shifting, because of political and technological paradigm changes.

In those early days, it soon became clear that there was going to be an enormous economic shift in South Africa. The country was moving away from an industry that

was heavily based on agriculture and mining. The future lay in the tertiary sector, the provision of services. This transition has caused dramatic changes. A lot of the development of a service-providing industrial model is riding on the development that led to the digital revolution, information technology, the internet (of things), now transforming yet again into Industry 4.0.

The statistics show that in South Africa there is a huge shortage of so-called STEM-trained people. This probably is the case all over the world, but because of the peculiarities of the South African educational system this is an even more pressing issue here. There are simply too few people training in science, technology, engineering and mathematics. The result of that is that even though BC iTversity is a relatively small institution, the educational and industrial footprint of the institution is quite sizeable. This was rapidly noticed by the end stakeholders of the country.

Very soon it was clear that BC iTversity was a choice partner for industry and authorities. The result of this is a unique and permanent state of dialogue between institution and stakeholder groups. Employability is a major issue. There are many graduates who have studied and trained in the country who cannot find jobs, and have to be retrained or redirected to other academic fields. This constant dialogue makes sure that the curriculum offers relevant knowledge, skills, competences and personal and professional attitudes.

People from Europe or America do not seem to realise that there are other forces and conditions in Africa that have to be taken into account when we are talking about development. As an example, there is the specific case of technology leapfrogging. Africa never could afford to invest in internet cable connections given the geographic and demographic realities of the continent. What happened was that mobile phone, and especially smart phone technology was embraced instead. Based on this technology new, innovative and practical products were developed, much sooner than was the case in the rest of the world. We at BC iTversity had to follow suit, and that is one of the reasons why Botlhale Village is so important. Through this innovation centre we are able to keep track of what is required by the various stakeholders. We supply the necessary R&D to create answers to those questions, as is shown in the products that were developed by us. This in its turn helps to create a unique educational ecology, further conceptualised in our Learning Factory Model and the specific student experience we offer.

Our track record is that 100% of our graduates have jobs, because they are immediately employable in industry. Also, they are trained to show sound character and attitude, and they are able to organise their further academic development. And lastly, they are trained to become leaders in their professional fields and communities. It has been our aim to connect knowledge with skills and develop a positive character and a growth mindset to equip the 21st-century learner. This is a

very specific added value which is appreciated by all the stakeholders involved. And this is true empowerment of the people and their communities.

Jan K.M. Rombouts
Executive chairman
Pretoria
6th September 2018

Contents

Foreword by the chairman i

Document structure ix

Chapter 0 **Introduction** **1**

Belgium Campus iTversity 1

Chapter 1 **Diachronic context** **7**

South Africa 7

Education 13

Chapter 2 **Synchronic context** **19**

Rights and responsibilities 19

Governance and regulation 20

- Framework 20
- Quality councils 21

Basic education 24

Higher education 26

Vocational education and training 30

References 32

Chapter 3 **Character** **33**

Vision 33

Mission 34

Values 35

- A shared belief system 36

Strategies 37

- Maximising student success 37
- Widening access 39
- Increasing output and improving throughput 40
- Serving the community 41
- Expanding horizons 42

Primary challenge 42

References 42

Chapter 4 **Governance** **45**

Organisation 45

Strategic management 45

Contents

Executive management 46
Policy and practice 47
Operational Management 47
Language policy 47
Quality assurance 48
Faculty of Information Technology 49
Operational support services 50
Student representative council 51
Botlhale Village 51
Organisational and functional design 52
Primary challenge 52
References 52

Chapter 5 **Academia** **53**
Qualifications 53
Curricula 55
Internationalisation 56
Extracurricular programmes 58
Primary challenge 58
References 58

Chapter 6 **Teaching** **61**
Vision 61
Academic staff development 61
Resources 62
Exploiting technology 62
Learning materials 63
Student support 63
Mentorship and tutoring 63
Counselling 64
Special needs 64
Guiding principles 65
Primary challenge 66
References 66

Chapter 7 **Conclusion** **69**
Belgium Campus iTversity 70
Forward… an afterword by the CEO 74

Appendix A **Administrative information** **79**
Legal information 79
Regulatory information 80

Appendix B **Glossary** **81**
Acronyms and abbreviations 81
Definitions 82

Appendix C **Legislative and regulatory framework** **85**
Legislative entities 85
Executive entities 86
Statutory entities 87

Chapter 8 **Bachelor of Computing** **89**
Objective 89
Outcomes 89
Programme 90
Capstone 92
Assessment 95
Validity 95
References 95

Chapter 9 **Botlhale Village** **97**
Operational model 97
Open innovation 98
Accessible and democratic innovation 100
Supportive and accelerating innovation 100
Collaborative innovation 102
Sustainable and impact-yielding innovation 103
References 104

Chapter 10 **Curriculum design** **105**
Design and development 105
Verification and validation 110
Review and renewal 113
References 114

Chapter 11 **Internationalisation** **115**
Rationale 115
Vision of internationalisation 116

Mission in the context of international development 117
Goals 119
Opportunities 122
References 123

Chapter 12 **Performance data** **125**
Cohorts 125
Enrolments 125
Success rates 126
Success rates per demographic group 126

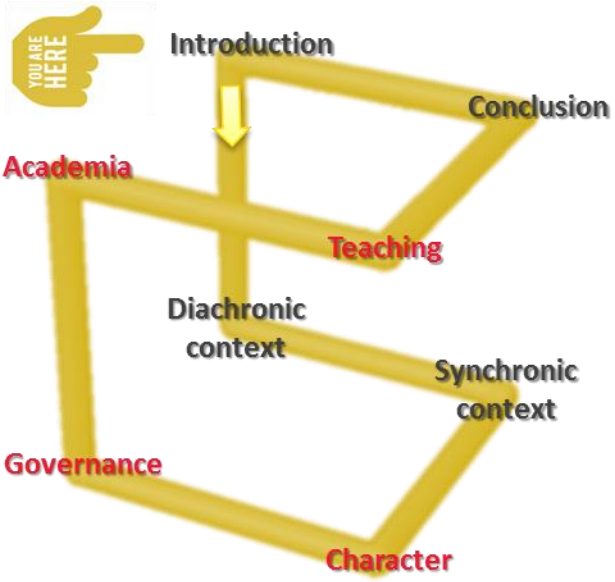
Chapter 13 **Teaching and learning strategy** **129**
Exemplary instruction 129
Enhancing academics as teachers 135
Feedback and assessment 138
References 140

Appendix D **National education and training statistics** **143**
Schools 143
Higher education institutions 144
Colleges 146
Students with disabilities 147

Appendix E **NVAO review standards** **149**
Framework for institutional reviews 149
Programme accreditation framework 150
Critical reflection 151
Supporting evidence 152
References 152

Document structure

This document is constructed to serve multiple purposes. The reader wishing a first introduction to or overview of the Belgium Campus iTversity may fruitfully read the first eight chapters. These chapters are presented as a continuous narrative which can be read sequentially.



The INTRODUCTION is followed by two chapters that describe the context within which Belgium Campus, as a higher education institution, lives and functions. The DIACHRONIC CONTEXT offers a synopsis of how the current South African education context came to be, while the SYNCHRONIC CONTEXT provides an overview of the current system. These chapters provide the necessary background to understand the unique attributes of the organisation described in subsequent chapters and explain and justify the reasons for the choices made and how it became the entity that it is. They address the questions of how we got here and where exactly it is that we now find ourselves. Readers who are already intimately familiar with the South African milieu and its educational system may usefully elect to pass over these chapters and continue on page 33 after the introductory chapter.

The next two chapters describe the institution from a holistic view as an enterprise. The chapter on CHARACTER describes the things that make Belgium Campus the institution that it is. Our slogan is *It's the way we're wired*. Here we describe how we are wired, what the shared beliefs are from which the institution emerges. The approach in this chapter is to describe the institution in terms of the artefacts produced when the organisation is imagineered, from the vision through the mission and values to the strategies that set the goals and cause the various initiatives with their objectives. GOVERNANCE describes the institution from a systemic view to show how it is engineered to reify the goals and objectives that it sets for itself. It is important to realise that this system represents an organism that lives and breathes and continuously adapts rather than a mere mechanical system. It describes the components that constitute the system, how they are wired together and how they produce the desired outcomes.

This is followed by two chapters describing the institution specifically as an institution of higher learning. ACADEMIA is concerned with the acquisition, safeguarding, expansion and dissemination of knowledge associated with the academic activities of a university. Beyond the knowledge itself, it also deals with how the university packages and transforms the body of knowledge into academic programmes, curricula, syllabi and qualifications. The chapter on TEACHING deals with teaching and learning, crucial to the achievement of the institutional mission and representing the central conceits with which the Belgium Campus differentiates itself as a unique higher education institution. To excel, our students must learn optimally and to achieve this, they must be taught in the best ways we can achieve. This is where we focus our idealism and where we strive for maximum impact.

The last chapter in this part of the document, CONCLUSION, reviews the threads of the narrative and synthesises them to present a final coherent and concise view of Belgium Campus iTversity. This is bookended with a set of appendices useful specifically to this narrative, but also generally.

The rest of the chapters in this document are intended as self-contained monographs. They may be read in any order and each serves as reference on a specific topic. Any of these chapters may be accessed by a reader whose interest in an area is piqued while reading the narrative in the first part of the document. It also serves the needs of any reader who wishes to refer to a topic they are already familiar with to confirm information or to discover new facets of the organisation.

As an institution specialising in computing and information systems, this organisation of the document is pleasing since the contents of the first part are intended to be accessed sequentially, while random access is intended for the second part.

Appendices to the second part include information external to Belgium Campus iTversity that is relevant to comprehending the institution's context and its role within the greater environment.

Chapters may include references as appropriate, identified using the following legend:


Reference to another chapter, appendix or section within this document


Reference to an attached artefact accompanying this document


Reference to documents available on site that may be provided electronically on request

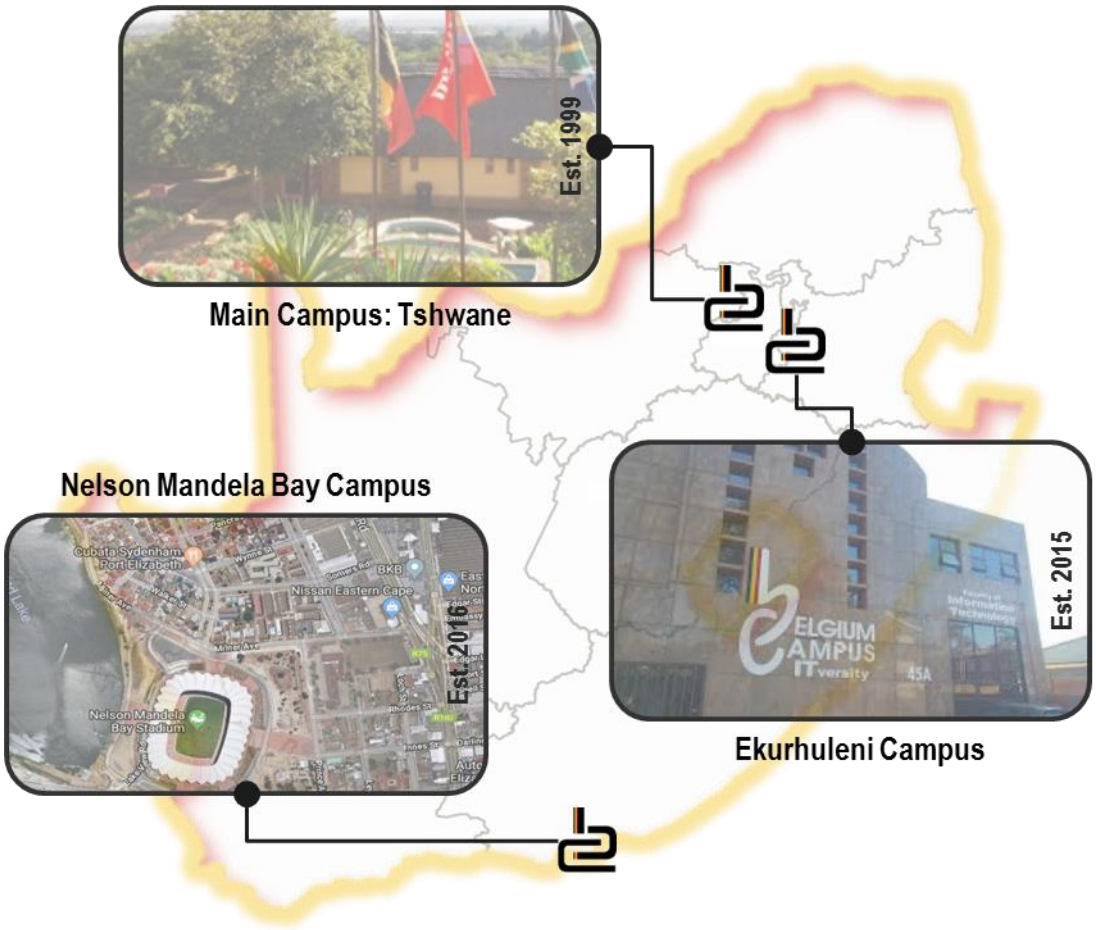

Reference to information that may be accessed online


Reference to physical artefacts that necessarily need to be inspected on-site

Chapter 0 Introduction

Belgium Campus iTversity

The Belgium Campus iTversity is a South African private higher education institution. Established in 1999 and starting with a first cohort of only six students, the institution now consists of three campuses in different metropolitan areas. As of August 2018, there are 879 students enrolled in academic programmes at Belgium Campus.



South Africa, as a developing country in the midst of transformation to create a just society with economic wellbeing for all its citizens, experiences great challenges. Massive levels of unemployment persist. Significantly, this phenomenon is not restricted to unschooled or semischooled groups – there are also large numbers of unemployed graduates.

At the same time, public and private enterprises are faced with a severe skills shortage and compete to employ the available pool of individuals who possess the skills and attributes that they require. These factors are indicative of a mismatch between the output of educational institutions and the requirements of industry.

It is essential to enlarge the skills pool by increasing the number of citizens who gain access to educational opportunities. It is also necessary to align the profiles of graduates from higher education institutions to the disciplines where skills shortages constrain economic development and equip such graduates with the attributes and competencies required by the modern world.

Belgium Campus iTversity recognised these factors and realised that it had to do things differently from the prevailing model followed by universities to ameliorate the urgent needs of both industry and society. From the start, the institution followed the principle that a Belgium Campus qualification must lead to employment for its graduates, either with companies or as entrepreneurs launching their own business initiatives.

Belgium Campus chose to focus its efforts in the discipline of information and communication technology (ICT). This well-defined focus on a single area is of course not constrictive, since ICT permeates most of the world today. Enterprises large and small rely on ICT to support and enable their operations. This field also experiences unparalleled growth and change as new technologies emerge rapidly and disrupt existing business models constantly. A highly-skilled ICT professional with the necessary business acumen adapts to this stream of changes and exploits it to generate new avenues and opportunities to succeed and excel.

The institution started out small and grew from there. Belgium Campus iTversity is a private not-for-profit company. Being a private institution enables the institution to exercise a high degree of autonomy and pursue its goals with integrity and the agility to adapt quickly to changes in the environment. Since the institution does not pursue the generation of profit, this means that its efforts and resources are directed towards and dedicate to its mission of producing high-quality graduates who will effect transformation in their own lives and their surrounding communities.

Many things are done differently than at the large public universities. Belgium Campus does things differently in order to make a difference. The students assume a central role and their wellbeing and success are the motivation that underlies the institution's actions.

The Tshwane campus, established in 1999, is nestled in an idyllic rustic environment on the slopes of the Magaliesberg mountain range. This provides a quiet setting where nature is undisturbed as much as possible, removed from the bustle of city life but close enough to reach it quickly. A host of different buildings are dotted along the mountain for educational, accommodation and administrative purposes. Individual lecturing facilities are small compared to other universities, with the resultant class sizes of 24 to 40 students allowing individual attention and engaging interaction during teaching and learning events.

In contrast with the unspoiled natural environment outside, the interiors host state-of-the-art facilities as is necessary for teaching the high technology of ICT. All classrooms are equipped with networked computers for every student, as all theory and concepts taught must be accompanied with appropriate practice to reinforce knowledge and reify it through hands-on experience.

The campus offers three undergraduate qualifications, namely the

- **Diploma in Information Technology**,
- **Bachelor of Information Technology**, and
- **Bachelor of Computing**

at levels six, seven and eight of the National Qualifications Framework, respectively. Specialisation streams within these qualifications allow focus on various subdisciplines within ICT. The qualifications of Belgium Campus are unique in the sense that the curricula are compiled in cooperation with members of industry and academic institutions in South Africa as well as Europe. The exit-level outcomes are determined according to world-wide industry needs and academic standards.

Each module is constructed to provide deep insight into the theoretical foundation of the subject. The theory is then applied to the latest software products, but the knowledge gained is product-agnostic and can be applied to different implementations of the theoretical framework. The aim is always to engender logical thinking and creative problem-solving in the student.

Technical education is always integrated with the development of the interpersonal and other soft skills that are essential to the profile of a successful professional. Courses are designed to teach writing skills, verbal communication and presentation skills as integral components that contribute to the successful completion of each module. Care is taken to develop these skills in students of all different personality types, to maximise each student's opportunities of actualising their potential. Experiential learning is integrated as a major part of the study programme and is critical in preparing students for placement in the IT industry when they graduate.

Belgium Campus developed and implements a Participative Development Model for Education (PDM) with the aim of equipping students with the relevant and up-to-date knowledge and skills to ensure that they can be employed immediately upon graduation and remain employed in the long run. This aim stems from the institution's belief that the key factor for curriculum development is employability.

The PDM operates through continuous engagement with all stakeholders, namely students, academia, industry, government and larger society. This continuous collaboration between stakeholders creates a valuable positive feedback loop, which facilitates the finding of tailored solutions and answers to the identified needs of all stakeholders. The success of the PDM for Education has been demonstrated through

low student drop-out rates, immediate employability of students with on or above average sector salaries and rapid career advancement of graduates.

Botlhale Village was established in 2014 to serve as research and innovation hub and incubator for new small business enterprises spawned by these activities. In this way, Belgium Campus iTversity injects contributions to the economic upliftment of South Africa directly. Research and innovation initiatives are directed towards the needs of the surrounding community and the improvement of conditions for these citizens. In this, Botlhale Village follows in the footsteps of Belgium Campus to exemplify responsible and good citizenship. Botlhale Village, along with Belgium Campus's other expansion initiatives, significantly increases the institution's impact in South Africa and articulates with the visions of government ministries:

- **Department of Science and Technology** (DST) desires to create graduate and post-graduate students in ICT, whom it supports through bursaries, demonstrating this department's belief in ICT as a driver of economic growth.
- **Department of Trade and Industry** (DTI) desires to create new economic entities through start-up initiatives exploiting innovation based on the research value chain. This proposed initiative specifically addresses ICT innovation across industries while stimulating economic growth and positively impacting on the community.
- **Department of Higher Education and Training** (DHET) desires to increase access to education. The existing 26 public universities are currently limited in their capacity to address these needs and therefore the Department encourages private institutions to operate in niche sectors, thereby expanding the available educational opportunities and delivering excellent education in their specialised fields.

Belgium Campus also expanded geographically to extend the opportunity to benefit from its high-quality education to other parts of the country. South Africa has eight major metropolitan areas and satellite campuses were established in two more of these – in Ekurhuleni in 2015 and in Nelson Mandela Bay in 2016.

Learning factories were created as physical workspaces where students can engage in creative, hands-on development and testing of prototypes, allowing them to build innovative real applications for the real world. These factories are, in effect, incubation hubs for real-life applications where students, from their first academic year, collaborate with academic and industry experts on:

- Aeronautics (a full-scale hangar and operational aeroplane are used for this factory);
- Smart farming;
- Mobile health;

- Creative economies; and
- Education.

Virtual mobility programmes, exploiting video conferences and Skype, and short exchange programmes in the form of international weeks abroad or hosted by Belgium Campus, enable students from different disciplines meet in the service of ICT. These short programmes allow students to travel globally to present their innovation projects.

Belgium Campus is the first higher education institution in South Africa to develop and deliver a programme for Deaf students. This, along with programmes to sponsor students from historically disadvantaged demographic groups and the general high level of financial aid provided in the form of bursaries and scholarships, demonstrates the institution's fundamental belief in redressing past inequities and contributing to the transformation of South Africa.

With its impressive track record, high ideals and ambitious plans, Belgium Campus iTversity has delivered significant impact and intends to overshadow this with future achievement.

Chapter 1 Diachronic context

This region represents a marvellously rich melting-pot of peoples, cultures and languages that resulted in today's rainbow nation. Southern Africa's first inhabitants were the Khoekhoen and the Sān. Around fifteen centuries ago the Nguni migrated down the east coast of Africa to arrive from the north and settled in the east as the Xhosa, Zulu, Swazi and Ndebele. The Sotho arrived contemporaneously and settled in the north as the Basotho, Tswana, Pedi, Venda and Tsonga. Halfway through the 17th century, the Dutch settled in the south-west. They soon brought their slaves from the Dutch East Indies, modern-day Indonesia but calling themselves Malay. This is not to mention the political prisoners from all over South-East Asia banished to this new land.

French joined the mix as the Huguenots fled religious prosecution in their homeland. The British, long at war with the Dutch in the East, arrived at the beginning of the 19th century. Midway through this century the Indians arrived, at first to work on the sugar plantations on the eastern coast, following by the Chinese at the beginning of the 20th to construct railroads. Significant groups of Portuguese, Greeks and Jews were added.

All these ingredients met, fought with each other, cooperated with each other and married each other to produce today's multicultural single nation. The rainbow name adopted by South Africans to describe themselves refers firstly to hope and optimism, of which the rainbow is a symbol in many of the constituent cultures, while also denoting the harmonious mix of all these diverse elements into a unique new creation.

This chapter takes a brief retrospective of how the context developed to provide some insight into why it has taken the form it now has.

South Africa

On 27th April 1994, celebrated annually since as *Freedom Day*, South Africans went to the polls to vote in the first election conducted in the country's history with universal suffrage and thereby elect South Africa's first democratic government.

A multi-party constitutional negotiation process developed a collection of constitutional principles. The elected constitutional assembly engaged in a massive public participation programme to create a new Constitution[i], which was certified by the Constitutional Court as complying with the constitutional principles, adopted by the Constitutional Assembly and signed by the President to become the supreme law of the country.

These watersheds marked fundamental and, viewed in retrospect, abrupt changes in the national character as one nation whose citizens had discovered they could all strive and thrive in union through cooperation and negotiation. Before, South Africa in the twentieth century was a divided, scarred and conflicted country.

Born in strife

The beginning of the century saw the two Dutch republics lose their second war against, and independence to, the British Empire. Now colonies of Britain, they were merged with the other two British colonies to the South to form the four provinces of the Union of South Africa[ii] in 1910. During the peace negotiations to end the war, both sides chose to ignore the rights and interests of the black Africans in the country, leaving them disenfranchised. This resulted in a society with lingering enmity between former combatants based on language and oppression and exploitation based on race. The terms of the peace only moved to establish equal rights for *uitlanders*, i.e. other Europeans, as capitalism trumped liberalism with as prize the richest sources of gold and diamonds in the world to be secured for the empire.

The political conflict and eventual undeclared war that followed, with events ranging from the assassination of the prime minister in parliament to the slaughter of adolescent school children, are well-documented and not the object of this review. Rather, it will reflect on the state of education during this period and how it was employed in the arsenals of all sides to pursue their aims. This demonstrates that the role-players were astutely aware of the power of education to shape the worldviews of successive generations of youth and were willing to use this for their own ends.

Shaping generations

Following the incorporation of the Dutch republics into British crown colonies, High Commissioner Alfred Milner sought to anglicise the population. Several thousand teachers were brought from Britain to establish a school system that would educate all children in English. The Dutch Reformed Church responded by establishing Dutch schools under a system of Christian National Education. The underlying philosophy of this system may be traced back to Ælfric's (c. 990) division of all men into three earthly ranks[iii] and the European view of society that grew from feudalism and stated that each man had his master. Here, roles and superiority were often defined by ethnicity. The Calvinistic roots of the religion reinforced these ideas since they were deemed to be predestined and not to be questioned.

Unification of the four colonies in 1910 with Dutch and English as official languages and the recognition of Afrikaans as an official language in 1925[iv] went some way toward establishing a common system and the provision of mother-tongue education, at least for the white population. The education provided to the indigenous black population was minimalist and inferior by any objective standards. This would not be improved by the events of 1948, when the National Party came to power and institutionalised its policy of apartheid. This policy of segregation and separate development along racial lines would see the establishment of separate systems for all parts of society, notably also for education. The existing animosities between Boer and Brit, between Afrikaners who wished to integrate and those who wished to isolate, between imperialists and republicans, would eventually become overshadowed by conflicts between different race groups.

1968: The world changes

The '60s was a decade of upheaval and change around the globe. The rise in black consciousness manifested in various forms. Ghandiesque passive resistance and mass gatherings ignited lasting change in the United States. In the United Kingdom it would take a while longer as the Powell-regime's "*rivers of blood*" fear tactics strove to stave off change. More militant approaches led to violence, such as at Langa and Sharpeville (21st March 1960, commemorated annually as *Human Rights Day*) in South Africa. The wave of *uhuru* washed over Africa as country after country demanded freedom and independence. Maps changed as former empires crumbled.

People discovered their power as they took to the streets and forced governments to take note of them. Institutions of higher learning were often the focal points, as students, who were after all there to learn to think for themselves, intellectuals and socialists united to give voice to their unhappiness.

Thirdly, the simmering cold war between the first and second worlds often approached flashpoint as these two enemies manoeuvred for power and attempted to expand their influence in Europe, Asia and Africa.

At this semicentennial, the importance of 1968 in global history is considered, scrutinised and discussed. Ironically, at this time when Apollo 8 showed the world the view of the Earth rising over the moon and we could appreciate that we all inhabit a shared planet in space, the world was far from united. There are no borders on the globe, but they certainly exist on humans' maps.

In January 1968, students from the Congo's Lovanium University pelted the visiting US vice-president with eggs and tomatoes, embarrassing their government. In February, 100 000 students from major universities in Cairo and Alexandria rose up and forced the Nasser-regime in Egypt to promise the restoration of civil liberties. March saw protests at the University of Tunis in Morocco and opposition to Western influences at the University College of Addis Ababa in Ethiopia.

In May, a localised student protest against proposed reforms in higher education at the Nanterre campus of the University or Paris became a major upsurge of popular protest that, at its height, mobilised millions of students and intellectuals, workers and trade unionists, in revolt against the regime of Pompidou and de Gaulle. It rocked France for two months and had an impact across Europe and North America.

July saw anti-American demonstrations at the University of Dar es Salaam in Tanzania, while students from the University College of Nairobi marched through the streets in anti-Soviet protests the month after. In August, students at South Africa's oldest university, the University of Cape Town, protested the institution's poor handling of the *Mafeje Affair* and occupied the university's administration building in a sit-in along the lines of the university occupations then taking place in the rest of the world.

The South African Students Organisation (SASO) was founded in 1968. Steve Biko, in his column in the SASO Newsletter[v], objected to the intellectual arrogance and paternalism of white people and campaigned for an end to apartheid and the transition of South Africa toward universal suffrage and a socialist economy. Decades later, reconsideration of Biko's output and rediscovery of the influence on him by Frantz Fanon would trigger renewed calls for the decolonisation[vi] of educational content and systems in South Africa.

Students were regarded as a particularly dangerous source of protest against the apartheid regime, and further segregation was seen as a method of control.[vii] Separate universities were founded for Xhosa, Northern Sotho, Zulu, Coloured and Indian students at Fort Hare, Turfloop, Ngoya, Bellville and Westville, respectively[viii].

The scenes in Prague in August as the Soviet Union invaded Czechoslovakia provided fuel for South Africa to obfuscate demands for civil rights behind red fears. The minority white population, influenced by an alliance of state and church, chose to sacrifice their sons. From the age of sixteen, all white males became legally obligated to perform National Service. Conscripted into the armed forces, they died in border wars in neighbouring countries to oppose alleged communist encroachment.

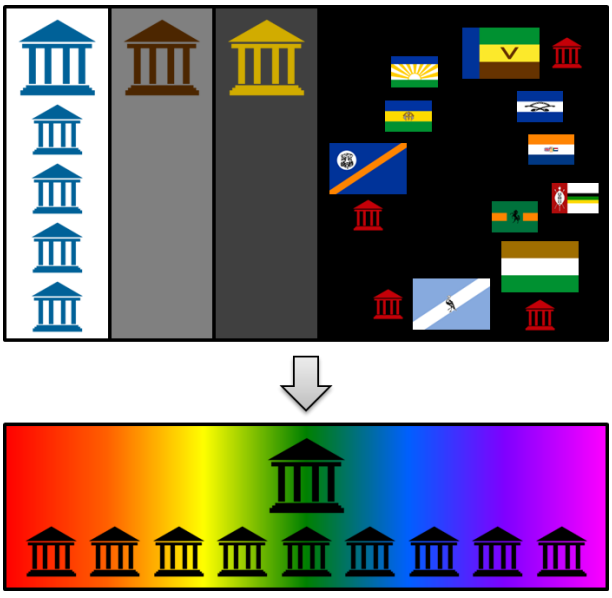
Change in South Africa would need to wait another decade and a half until *Generation X* grew up to the age where the cognitive dissonance of the situation caused the children of the ruling minority to reject their upbringing and join their voices in the clamour for justice.

Dark days

Things would get worse before they got better. The '70s saw the introduction of policy to use three languages of instruction in black secondary schools, so that subjects were divided between being taught in English, Afrikaans and the students' mother tongue. Widespread dissatisfaction with this state of affairs erupted into violence in Soweto on 16th June 1976, commemorated annually as *Youth Day*, and spread through the country from there. The struggle slogan, *No education without liberation*, would lead to lost generations without schooling to equip them for jobs beyond physical labour.

The '80s saw the abandonment of the Westminster system of upper and lower houses of parliament. The President's Council, consisting of sixty White, Coloured, Indian and Chinese members proposed the implementation of *power sharing*, accepted by two-thirds majority in the constitutional reform referendum of 1983, leading to the establishment of a tricameral parliament with separately elected chambers for White, Coloured and Indian citizens. Black South Africans remained unrepresented in the national government as they could ostensibly exercise their political rights in the ten homelands. Four of these, Transkei, Bophuthatswana, Venda and Ciskei (the TBVC states) were declared independent, while the remaining six received partial autonomy.

This system was wholly infeasible as it required the multiplication of bureaucracies to support so many parallel organs of state, contributing to economic collapse as this spending increased, while international sanctions and boycotts led to decreased income.



LEGISLATIVE ASSEMBLIES ANTE- AND POST-1994

South Africans from all ethnic groups started to resent, and then resist, the unjust system into which they had been born. Civil disobedience, mass protests and the embracing of *alternative* cultures characterised daily life.

The fall of the Berlin Wall and the

Soviet Union demolished the feigned red fears used to justify past actions. It became increasingly difficult to control information and silence the free press, even under states of emergency.

Resistance to seeking solutions evaporated as intellectuals spread the simple message that negotiation necessarily precedes achieving your objectives, not the other way around.

From *amandla* to *ubuntu*

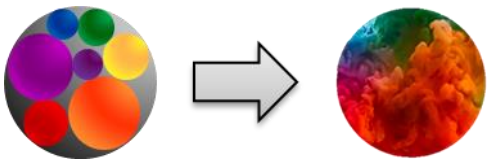
When change finally came, it happened very quickly.

In February 1990, the ban on all opposition organisations was repealed and political prisoners were released. Negotiations commenced in May. Twenty-seven political entities signed the National Peace Accord in September 1991, paving the way for the two Conventions for a Democratic South Africa in December 1991 and May 1992. The Multiparty Negotiating Forum of 1993 ratified an interim Constitution. The first democratic general election was held in April 1994 as millions of South Africans of all colours queued together over four days to cast their votes for nineteen different parties, with a turnout of 86.9% of voters.

It took just over four years to achieve a goal previously often thought to be impossible. The call of "*Amandla! Awethu!*" (*Power to the people*) had been answered.

Since, South Africa has been engaged in healing, reconstruction and transformation. The country adopted a new flag, national anthem and national symbols and assumed a new national identity. A humanist philosophy of ***ubuntu*** (lit. "*I am because we are*") embodies the new belief in the universal interconnectedness from which humanity emerges – "*a person can be a person only through other persons*[ix] ".

On *Freedom Day* in 2000, South Africa changed its national motto, previously **Eendracht maakt macht** and **Ex unitate vires** (strength in unity), to **!ke e**: **|xarra ǁke** (unity in diversity). This subtle shift from cohesion to adhesion intends to promote nation building. Rather than different marbles collected in a bag but remaining separate from each other, South Africans unite as different pieces of clay contributing to a whole, retaining their identities while mutually enriching each other. In this way, the whole truly becomes greater than the sum of its parts, as envisioned[x] earlier by a South African thinker and statesman, now reified with a uniquely African character.



Education

For the first 150 years the settlement at the Cape had a spell of 17th-century Dutch religious education transplanted from the Netherlands. The control of the Dutch Reformed Church was supreme during the Dutch East India Company's regime. Its doctrine of salvation by faith brought with it the personal obligation that every individual must be able to read the Bible in order to meet their personal religious duty. The people believed in education. This assured a high degree of literacy, through missionary endeavour extended to all peoples encountered. In this respect the Protestant-oriented South African settlement formed a marked contrast with those in, for example, Latin America, where a high degree of illiteracy has prevailed even up to recent times.

Early days

For a few years at the end of Company's regime, the colony had the guidance of the able administrator, Commissioner-General J.A. de Mist and was on the point of working out a system of their own, when in 1806 the Cape was taken over by England. The introduction of English methods of instruction, the monitorial systems of Andrew Bell and Joseph Lancaster, and the English language as the prevailing medium of instruction, led to the bulk of the population, who were Dutch-speaking, to come to look upon schooling as something exotic, imposed upon them from above and divorced from their needs, their language and their everyday life.

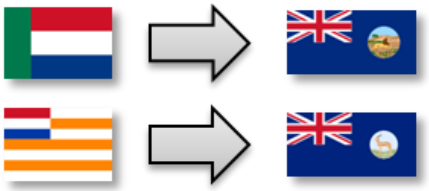
John Herschel, the eminent astronomer who happened to be at the Cape at the time, was instrumental in the establishment of an Education Department in 1839. This department did much to systematise the rather haphazard educational efforts throughout the country, and proved to be the prototype according to which, in subsequent years, the administrative systems in other parts of the country were patterned. The introduction in 1865 of a £-for-£ grants-in-aid system[xi] stimulated education, largely owing to the generous support which the Dutch Reformed Church gave to the state schools.

The Cape Colony developed a system of districts with school boards[xii] to run schools on the grammar school model, but when these proved too weak to meet the cost of education, the government was obliged to take over the financial responsibility for running the schools. This accounts largely for the centralised nature of educational administration, in contrast with the decentralised systems that evolved in countries with federal structures.

Moving inland

The system in the Dutch republics was initially individualistic, each parent engaging an itinerant schoolmaster as needed. Then the republics went through a stage of grants-

in-aid with local responsibility, but soon, as the logical outcome of their republican constitutional system, the state assumed control and financial responsibility for the establishment and maintenance of schools.



During the Kruger regime in the Transvaal, teachers were imported from the Netherlands and came under strong Dutch influence. In contrast, in the Orange Free State a Scotsman, Dr John Brebner, was appointed as superintendent and under his administration for almost a quarter century a system of education developed not unlike that of Scotland with respect to contents, methods and organisation. As this system did not involve the exclusion of their own language as a medium or as a subject of instruction, it did not encounter resistance from the people, who showed no aversion to the introduction of English as language. This accounts for the fact that the Orange Free State was for many years the most bilingual of the provinces.

The British administration following the end of the Second Anglo-Boer War put an end to the educational development in the two former republics. An English system was imposed and opposition schools were established by an organisation termed Christian National Education. When responsible government was granted a few years later, compromise was effected, providing a synthesis between the old and new regimes and placing the language rights of both English and Dutch speakers on an equitable basis in the Transvaal and Orange River Colonies under Gens. Smuts and Hertzog, respectively.

The system of educational administration in Natal was unique in that it alone had a relatively uninterrupted English system from the time of its inception. Schools modelled after the English public schools flourished in Natal.

Forged into one

The Act of Union, upon formation of the Union of South Africa in 1910, entrusted higher education to a national department, while other education was relegated to the provincial authorities. Provincial administration of basic education persisted for the next eighty years, with each province implementing its own systems and curricula, subject to greatly variant taxable income per capita to fund expenditure.

Certain anomalies in this system are worth mentioning. In the first place, the central government would take over certain educational functions in national interests, such as when provincial administrations did not have adequate resources to provide these services. Thus industrial, agricultural, vocational and technical education, child welfare and special education were by successive acts of legislation declared to fall

under higher education and so under the central government. The effect was that, while originally under the Act of Union the term higher education applied solely to institutions of university rank, it gradually came to cover, in an administrative sense, a range of education from nursery schools to the highest post-graduate classes at university.

On the provincial side, this demarcation of functions also had an anomalous counterpart. Besides administering primary and secondary education, the provinces trained teachers in their normal colleges, all of which gave courses of a post-secondary nature lasting two, three or four years.

A proliferation of bureaucracies

It should also be noted that, following World War I, the German colony of South West Africa was declared a League of Nations mandate territory of South Africa. It was administered as a de facto fifth province until its independence in 1990 as Namibia.

Prior to 1954 Native education, as it was then called, fell mainly under the care of church and missionary bodies, while the legislation in respect of this education was the responsibility of the Provincial Councils. The central government took over control of all black educational services[xiii] in 1954 and an autonomous Department of Bantu Education was established under its own ministry in 1958. This department was also responsible for the control and maintenance for the black university colleges[xiv] and in excess of forty teacher-training institutes. Education was further compartmentalised along racial line by placing the education of Coloured[xv] and Indian[xvi] students under different departments.

With the granting of self-government to the various black homelands, the control of education in those areas was transferred to the governments in question, establishing their own departments. Tertiary education institutions were established in the homelands to cater for the post-school educational needs of the regions.

Really forging into one

By the time democratic government was established in 1994, the administration of education in South Africa distributed over a dizzying array of departments. White education fell within the ambit of a national department and four provincial departments. There were national departments for coloured people and for Indians, which included all Asians. Black education had a national department and the departments of the former homelands, which were now reincorporated into South Africa. There was a national department for independent schools and for

higher education. Additionally, many instances of specialised education were located in other state departments, such as the agricultural schools or mining schools and the various institutions operated by provincial governments and municipalities to train their own personnel.

A daunting task lay ahead to forge all these departments with different systems and the schools, colleges and 36 tertiary institutions under their auspices with varying quality of education and standards of governance into a new education system that would serve the needs and aspirations of the new country.

> *"[E]ducation was the resultant of successive systems or parts of systems superimposed from without, and was hardly ever the spontaneous expression of the ethos or genius of the people. Only in comparatively recent times could the educational system be regarded as more or less an indigenous growth, with a peculiarly South African character.*[xvii] *"*

This description of the South African education system aptly describes the current context and seems strangely prescient, dating as it does from 1971. The importance of seeking a truly South African solution was demonstrated when the attempt to import Outcomes-Based Education and implement it without further thought proved a costly failed social experiment.

The transformation of the education system may be likened to changing the engine of a car while it necessarily continues to drive at full speed. The system has to be transformed while continuing to deliver education to the citizens of the country. Ministries were established, along with the statutory and regulatory bodies needed to implement policy. A single Department of Education (DoE) governed education until 2009, when it was divided into separate Departments for Basic Education (DBE) and Higher Education and Training (DHET). Skills development, as a levy-grant system to implement the national skills development strategy, was transferred from the Department of Labour to DHET to form part of the integrated post-school education and training system.

The previous four provinces, with the reincorporated TBVC states, were replaced by nine provinces to provide regional government. In the sphere of higher education, the 36 existing universities and technikons were restructured by a host of private bills enacted by parliament since 1994. Through a series of mergers and incorporations, founding of new universities for the two provinces that had none, and separation where previous mergers proved infeasible, the current environment of 26 public universities came into being. Additionally, since 2002, the 152 public technical colleges were merged into 50 larger multi-campus institutions and renamed, first as further education and training colleges, then as technical and vocational education

and training colleges. These 50 public colleges now operate over 260 campuses nationally.

Several legacies need to be overcome to achieve true social justice:

- Institutionalised ***apartheid***'s unfair discrimination based on race, culture and religious belief is being dismantled, but such a transformation is not achieved overnight.
- Historic ***colonialism***'s effects are seen in eurocentric biases in educational content and systems, while capitalism lingers in the deep-seated inequalities of wealth and the accompanying disparities in access to and attainment of education, health status and access to opportunities.
- The one thing that all past groupings had in common is ***patriarchy***, which is why its legacy of hegemonic masculinity is often not recognised. The invisible barriers that subordinate women and non-traditional gender roles need to be removed, not only with regard to overall numbers, but also to be represented equally at all levels of the different facets of society.
- The plight of the disabled, in the past relegated to the background due to ***ignorance***, must be addressed to empower them to function as equal members of society that simply have different abilities, not inferior ones.

The next chapter takes stock of the education system resulting from the transformation process and attempts to provide a brief overview of this system. It is important to keep in mind that the process is ongoing and that there are several components in the system that have not yet reached the state envisioned for them. It is, however, an active process and the system continues to evolve towards its ideals.

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[i] Constitutional Assembly of South Africa, (1996). **Constitution of the Republic of South Africa, 1996**.
[ii] Parliament of the United Kingdom, (1909). **South Africa Act**, 9 Edw. VII c. 9.
[iii] Chidester, D. (2000). **Christianity: A Global History**. London: Allen Lane.
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[v] Biko, S. (1987). **I Write What I Like: Selected Writings by Steve Biko**. London: Heinemann.
[vi] Fanon, F. (1963). **The Wretched of the Earth**. New York: Grove Press.
[vii] Seddon, D. (2017). "Popular Protest, Social Movements and Class Struggle in Africa". **Review of African Political Economy**. RoAPE.net.
[viii] Behr, A.L. (1970). Bantu education. In: **Standard Encyclopaedia of Southern Africa**, 1st ed. Cape Town: NASOU Limited, Vol. 2, p. 88.
[ix] John Templeton Foundation, (2013). **Desmond Tutu receives 2013 Templeton Prize at London's Guildhall**. [press release, 21 May 2013]: p. 1
[x] Smuts, J.C. (1927). **Holism and Evolution**, 2nd ed. London: MacMillan.
[xi] Government of the Cape Colony, (1865). **Education Act**, Act No. 13 of 1965.
[xii] Government of the Cape Colony, (1905). **School Board Act**, Act No. 35 of 1905.
[xiii] Parliament of South Africa, (1953). **Bantu Education Act**, Act No. 47 of (1953).

[xiv] Parliament of South Africa, (1959). **EXTENSION OF UNIVERSITY EDUCATION ACT**, Act No. 45 of 1959; and **UNIVERSITY COLLEGE OF FORT HARE TRANSFER ACT**, Act No. 64 of 1959.
[xv] Parliament of South Africa, (1963). **COLOURED PERSONS EDUCATION ACT**, Act No. 47 of 1963.
[xvi] Parliament of South Africa, (1965). **INDIAN EDUCATION ACT**, Act. 61 of 1965.
[xvii] Malherbe, E.G. (1971). Education, Administration of. In: **STANDARD ENCYCLOPAEDIA OF SOUTHERN AFRICA**, 1st ed. Cape Town: NASOU Limited, Vol. 4, p. 216.

Chapter 2 Synchronic context

This section describes the current landscape of education and training. The legislation and policies to create, implement, administer and regulate the system are referenced in the appendix LEGISLATIVE AND REGULATORY FRAMEWORK on page 85, while this text will discuss the resultant system.

Rights and responsibilities

Section 29 of the Bill of Rights (Chapter 2 of the Constitution) defines the rights to receive and to provide education.

This affirms the universal right to basic education and the state's obligation to widen access to further education, in accord with Article 26 of the Universal Declaration of Human Rights[i].

Significantly, it also enshrines the right to anyone to provide education and, as this applied to juristic persons, establishes the basis for the existence of independent educational institutions. This right is dependent only on such an institution not practicing racial discrimination, being regulated by the state through maintenance of its registration, and being quality assured to provide education at least on par with that of state institutions.

(1) Everyone has the right –
  (a) to a basic education, including adult basic education; and
  (b) to further education, which the state, through reasonable measures, must make progressively available and accessible.

(2) Everyone has the right to receive education in the official language or languages of their choice in public educational institutions where that education is reasonably practicable. In order to ensure the effective access to, and implementation of, this right, the state must consider all reasonable educational alternatives, including single medium institutions, taking into account –
  (a) equity;
  (b) practicability; and
  (c) the need to redress the results of past racially discriminatory laws and practices.

(3) Everyone has the right to establish and maintain, at their own expense, independent educational institutions that –
  (a) do not discriminate on the basis of race;
  (b) are registered with the state; and
  (c) maintain standards that are not inferior to standards at comparable public educational institutions.

(4) Subsection (3) does not preclude state subsidies for independent educational institutions.

BILL OF RIGHTS, SECTION 29

South Africa has been building a new education and training system since the advent of democratic government in 1994, with the goal of meeting the needs of a democratic society. Policy developments aim at democratising the education system, overcoming unfair discrimination, expanding access to education and training opportunities, and improving the quality of education, training and research. Policy instruments include legislation, White Papers and Green Papers.

With the prioritisation of national economic development, the role of education and training as contributor to development receives much attention. The National Development Plan, the New Growth Plan and other key government policy documents define important strategies and priorities for development, with an emphasis on inclusive growth and employment generation. The education and training system must respond to these, especially with regard to expanding the pool of skills and knowledge available to the country. Achievement of this goal will enable the expansion of the key economic focus areas and equip young people to obtain work.

Education's intrinsic importance is valued and quality education is an important right, playing a vital role in relation to a person's health, quality of life, self-esteem and the ability of citizens to be actively engaged and empowered.

Governance and regulation

South Africa is a unitary state rather than a confederation, resulting in centralised government. Provincial governments execute their functions subject to national legislation and policy. Legislative and executive powers are separated. Legislative power rests in parliament; executive power in cabinet. Each portfolio resides under a minister with a department under a director-general to execute its functions. Executive government for education and training is divided into two ministries.

The **Department of Basic Education** (DBE) administers the school sector. The national department executes its functions through the nine provincial education departments. Post-1994, all provinces implement a single national school curriculum.

The **Department of Higher Education and Training**[1] (DHET) administers the post-school education and training (PSET) sector nationally. The post-school system comprises all education and training provision for those who have completed school, those who did not complete their schooling, and those who never attended school.

Regulatory bodies are responsible for *qualifications*, namely the **South African Qualifications Authority** (SAQA) who maintains the ***National Qualifications Framework*** (NQF); and *quality assurance*, namely the quality councils for the three sub-frameworks of the NQF.

Framework

SAQA is the statutory body with overall responsibility for the implementation of the NQF. The NQF overarches the whole education and system in South Africa. It is organised as a series levels of learning achievement

[1] To understand the ambit of DBET, it is necessary to read *(higher education) and training*, rather than *higher (education and training)*.

ascending from one to ten. All qualifications and part-qualifications offered in South Africa are registered on the NQF. Qualification types are pegged to *NQF levels*.

SAQA defines the levels of the NQF through the specification of *level descriptors*. Each level descriptor is a statement describing learning achievement at a particular level of the NQF that provides a broad indication of the types of learning outcomes and assessment criteria that are appropriate to a qualification at that level. The descriptors are cumulative, i.e. there is a progression in the competencies from one level to the next.

Level descriptors are defined, for each level of the NQF, for ten categories of competency. The philosophical underpinning of the NQF and the level descriptors is *applied competence*, which is in line with the outcomes-based theoretical framework adopted in the SA context. Applied competence has three constituent elements:

- *Foundational competence* embraces the intellectual / academic skills of knowledge together with analysis, synthesis and evaluation, which includes information processing and problem solving;
- *Practical competence* includes the concept of operational context; and
- *Reflexive competence* incorporates learner autonomy.

a. Scope of knowledge
b. Knowledge literacy
c. Method and procedure
d. Problem-solving
e. Ethics and professional practice
f. Accessing, processing and managing information
g. Producing and communicating information
h. Context and systems
i. Management of learning
j. Accountability

CATEGORIES OF APPLIED COMPETENCIES

The *Critical Cross-Field Outcomes* of SAQA are embedded in the level descriptors.

Quality councils

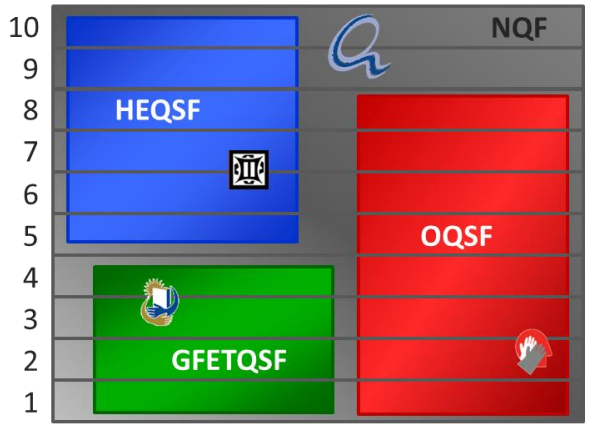
The primary bodies with a direct role in governing quality assurance and defining the sub-frameworks of the NQF are the quality councils:

- The **Council on Higher Education** (CHE) is responsible quality assuring programmes and accrediting qualifications on the ***Higher Education Qualifications Sub-Framework*** (HEQSF).
- **Umalusi** is responsible for the ***General and Further Education and Training Qualifications Sub-Framework*** (GFETQSF).
- The **Quality Council for Trades and Occupations** (QCTO) is responsible for the ***Occupational Qualifications Sub-Framework*** (OQSF).

These bodies set standards, quality-assure the provision, curriculum, assessment and (in the case of Umalusi and the QCTO) certification of qualifications on their respective frameworks, and maintain a database of learner achievements.

In addition, professional bodies such as the SA Institute of Chartered Accountants and the SA Nursing Council have oversight of qualifications in specified areas, subject to the NQF Act. In specific instances, particularly with regard to the OQSF, certain functions are currently delegated to other statutory bodies while the QC builds capacity to assume these responsibilities.

The three sub-frameworks are differentiated by types of qualifications and the quality councils are responsible for controlling the nomenclature of the qualifications in their respective sub-frameworks. It is important to keep in mind that the QCTO has not yet aligned historically registered programmes under its ambit to the OQSF, so that qualifications may still be found on this sub-framework that do not comply with the expected nomenclature.



THE NQF AND ITS SUB-FRAMEWORKS

The quality councils have an extended remit in the sense that they can quality-assure qualifications on NQF levels from which they were previously restricted. Educational institutions are not limited to offering qualifications in a particular sub-framework. Each programme is quality-assured by the appropriate quality council.

Quality assurance is performed through the processes of *accreditation* and *reaccreditation*, wherein evidence is evaluated as submitted by institutions and as discovered through site visits.

Information system

SAQA maintains an electronic information management system of the South African NQF since November 1999, named the **National Learners' Records Database** (NLRD). This system represents a significant innovation of the education system and was the first of its kind. SAQA has since assisted countries like the United Arab Emirates and Namibia in developing information management systems for their qualification frameworks.

Each education and training provider sends its learner achievement data to the quality assuring body that accredited the provider to offer that particular qualification. These bodies submit their datasets to SAQA for loading onto the NLRD.

The NLRD enables SAQA to manage the NQF and report on aspects of the education and training system in South Africa. It provides:

- Comprehensive information for policy-makers to enable evidence-based decision-making and planning;
- Types of qualifications required or over-supplied;
- Proof of qualifications obtained for learners and employers; and
- Information that assists with career development and advice.

People	18 052 595
Qualification achievements	14 370 038
Accredited providers	4 205
Qualifications	11 294
Unit standards	11 492
Professional bodies	99
Professional designations	359

NLRD INFORMATION AS AT 30 SEPTEMBER 2017

Beyond tracking progress and achievement, the trend reports also track articulation within and across the NQF and show the pathways followed by students to reach their achievement levels.

Articulation

One of the reasons for establishing the South African NQF was to facilitate movement of learners within education, training and career paths. In other words, the NQF was established in part to enable the connection between qualifications to allow for movement of learners through the formal education and training system and its linkages with the world of work. With the NQF, learners are able to move within and across sub-frameworks from the GFETQSF to the HEQSF or across to the OQSF and vice versa.

Articulation pathways facilitate access to learning and avoid duplication of learning already covered. Articulation refers to mechanisms that enable mobility between and among institutions. It has *horizontal* aspects dealing with courses and programmes at a given level of learning, and *vertical* aspects dealing with courses and programmes at different levels. While systemic articulation is based on national policy and formal requirements, specific articulation is based on agreements between institutions and is guided by institutional policies.

The mechanisms for giving effect to the desired movement of individuals within and between qualifications are:

- *Recognition of prior learning* (RPL) provides alternative routes of access to education. It is the process through which non-formal learning is measured, evaluated and translated into its perceived formal equivalent to provide access to leaning programmes or advanced standing within qualification programmes.
- *Credit accumulation and transfer* (CAT) promotes articulation between qualifications within a sub-framework of the NQF and across sub-frameworks.

Credit accumulation is the totalling of credits towards the completion of a qualification. Credit transfer is the vertical, horizontal or diagonal relocation of credits towards a qualification.

Basic education

For historical reasons, the school system is divided into primary schools (grade 0 to 7) and secondary schools (grade 8 to 12). The DBE groups grades into two bands:

- **General Education and Training** (GET) includes grades 0 to 9. This is further subdivided into phases, namely the *Foundation Phase* (grades 0 to 3), the *Intermediate Phase* (grades 4 to 6) and the *Senior Phase* (grades 7 to 9).
- **Further Education and Training** (FET) includes grades 10 to 12 and non-higher education vocational training. Grade 12 is commonly referred to in South Africa as *matric*. Some independent schools offer an optional grade 13 year (post-matric).

Basic education falls within the GFETQSF of the NQF and its qualifications are quality-assured and accredited by Umalusi.

In 2016, 12 932 565 learners attended 25 574 ordinary schools and were served by 418 613 educators[ii]. These schools are distributed over 86 districts across the 9 provinces.

These data include all primary and secondary ordinary schools in the school sector, in other words it does not include special needs education (SNE) schools.

	Public	*Independent*	*Total*
Schools	23 719	1 855	**25 574**
Educators	381 394	37 219	**418 613**
Learners	12 342 213	590 352	**12 932 565**

DATA FOR ORDINARY SCHOOLS, 2016

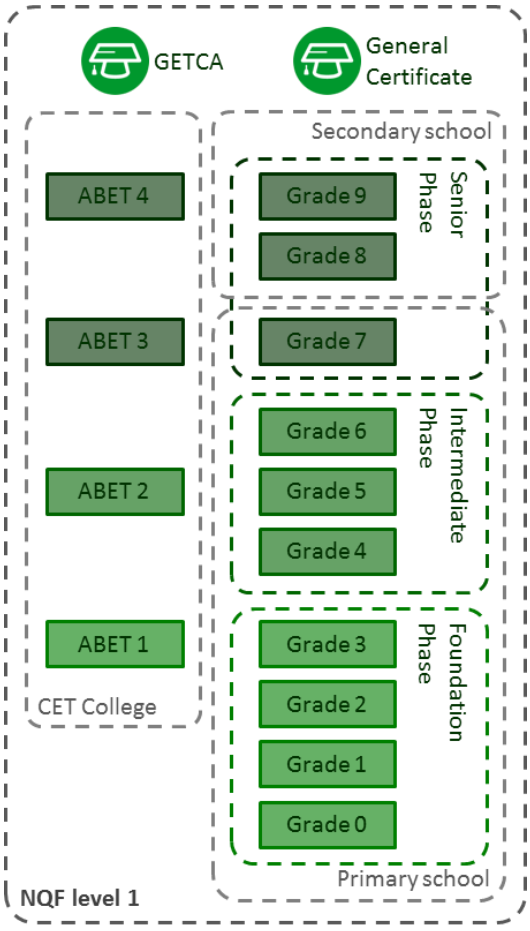
Challenges experienced by DBE include:

- The provincial education departments of the provinces containing the administrative centres of the four ante-1994 provinces have well-established bureaucracies, infrastructure and systems, while the other five provinces are still establishing these.
- Major inequities still exist between urban and rural schools, with schools that are poorly resourced and supported exhibiting poor performance and results.
- The abolition of the teacher-training colleges has led to a severe shortage of adequately-trained, qualified, competent and dedicated teachers that are essential to an effective school system. Public school teachers' salaries are funded from central government, with limited resources available.

- It is still an ongoing educational process to instil a culture of learning and earning the opportunity to achieve a better life.

Community education and training colleges (CETCs), under the auspices of DHET, cater for youth and adults who did not complete their schooling or who never attended school. Nine community colleges, one in each province, have been established and include the incorporation of 3 279 community learning centres (2 795 CLCs were active in 2016). **Adult Basic Education and Training** (ABET) is being rolled out, with government committing to involve one million adults and youth in community education by 2030.

Post-school youth and adults are targeted who wish to raise the base for further learning, improve their skills for employability and/or progression to opportunities in the TVET colleges and university education. There is a policy for education and training from the provision of formal literacy and numeracy to a diversified programme mix which includes formal qualification, occupational qualifications and part qualifications and skills through the establishment of networks and partnerships with community-based organisations (CBOs), non-governmental organisations (NGOs), as well as faith-based organisations (FBOs). In essence, community education and training offers programmes that contribute to improving community cohesion and social capital, and are responsive to geographic and sectoral needs and challenges.



GENERAL EDUCATION AND TRAINING

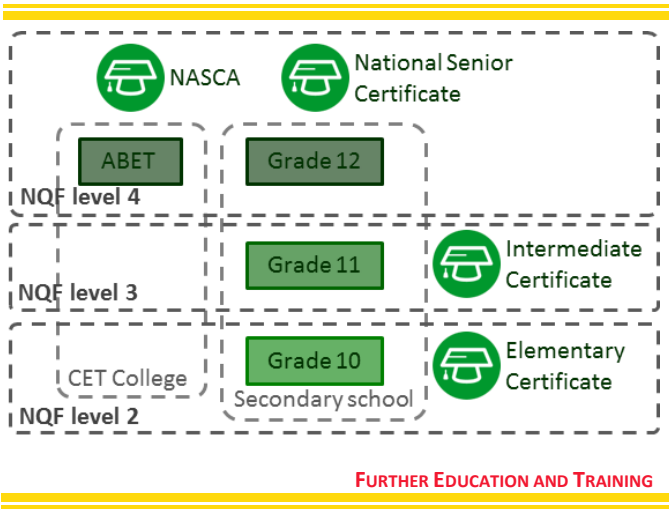
Schooling is compulsory for all South Africans from the age of six to the age of fifteen or the completion of grade 9. This corresponds to the GET band of the GFETQSF.

Successful completion of this band leads to the award of a **general certificate** (or the equivalent **general education and training certificate for adults** for ABET programmes). These learners may elect to stay in school (or CET college) to continue their studies in the FET band, which is the route to a national certificate, necessary if

the learner intends to pursue higher education. They may also decide to continue these studies through vocational programmes at TVET colleges.

They may also choose alternate pathways of learning, such as technical education, artisanship or various learnership options available in skills development programmes.

The path to higher education leads through a **national senior certificate** (or a **national senior certificate for adults** for ABET programmes).



Higher education

Higher education falls within the HEQSF of the NQF and its qualifications are quality-assured and accredited by CHE. Higher education is administered and regulated by DHET.

Entry into higher education requires matriculation endorsement, i.e. a national senior certificate endorsed to state that the learner may be granted access to certificate studies, diploma studies or degree studies.

The National Development Plan outlines three main functions of higher education institutions (HEIs). First, they educate and provide people with high-level skills for the labour market. Second, HEIs are the dominant producers of new knowledge, they assess and find new applications for existing knowledge, and they validate knowledge and values through their curricula. Third, they provide opportunities for social mobility and strengthen social justice and democracy, thus helping to overcome the inequities inherited from the past.

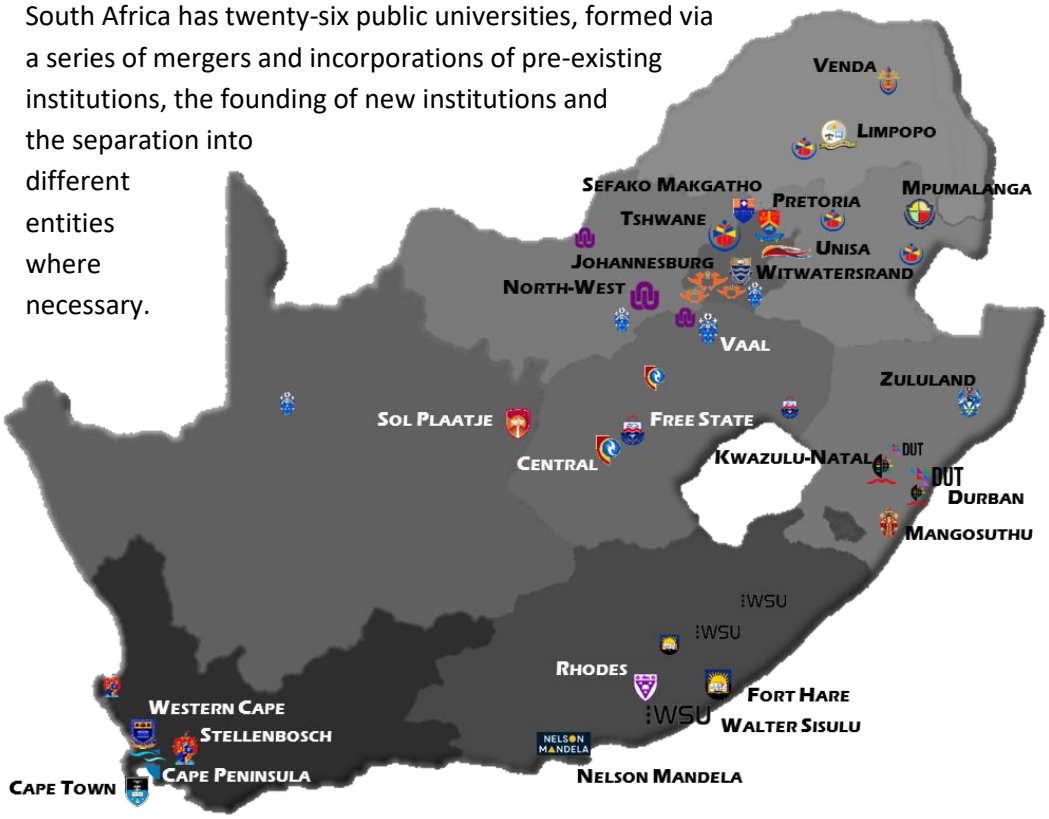
Public HEIs are named as universities, while independent institutions are referred to as private higher education institutions (PHEIs). Initially regarded by DHE and CHE with at best, distrust, and at worst, antagonism, PHEIs are now recognised as vital components of the higher education sector to supplement the capacity that the state is able to deliver through public institutions and to provide the desired diversity by offering programmes in niche and specialised fields that are in some instances not found in traditional universities. This improved standing is of course also due to stringent quality control by CHE and strict regulation by DHET to close down

unscrupulous PHEIs utilising gaps and weaknesses in the quality assurance system to their advantage and misleading students regarding their accreditation status.

HEIs are crucial institutions in terms of reaching national objectives. This includes supporting the rest of the post-school system and aligning curricula and research agendas to meet these objectives, including tackling the challenges of poverty, unemployment and inequality.

DHET affirms the principles of academic freedom, institutional autonomy and public accountability. Its main focus is on promoting the improvement of quality and building appropriate diversity. The aim is to ensure that a wide range of high-quality options is provided throughout the system, as well as to improve articulation between HEIs and between universities and other post-school institutions. South Africa needs a diverse higher education sector which is *purposefully* differentiated. DHET will focus on increasing research and innovation, improving the quality of research, and building on areas of strength identified as important for national development.

South Africa has twenty-six public universities, formed via a series of mergers and incorporations of pre-existing institutions, the founding of new institutions and the separation into different entities where necessary.



Multiple campuses, as seen in the accompanying graphic, are often the result of such mergers of different universities. It is also notable that the universities are generally concentrated in the major metropolitan areas of South Africa and the remote institutions represent those located in the previous homelands.

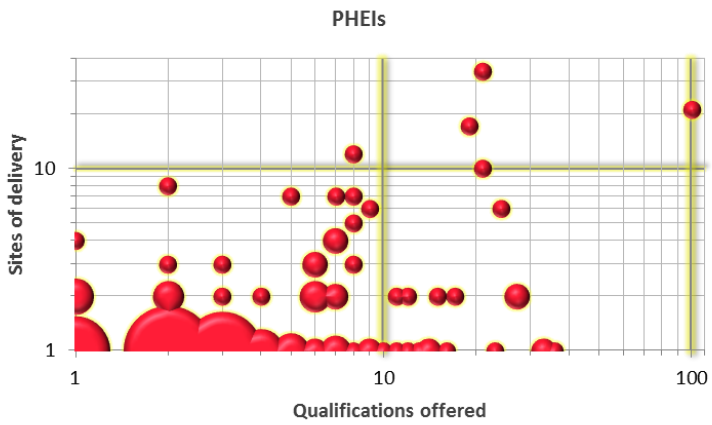
These universities are classified as follows:

- Fourteen traditional universities, including two newly-established entities whose classification may change when they have finalised their programme offerings;
- Six universities of technology, previously known as technikons; and
- Six comprehensive universities, combining the functions of traditional universities and universities of technology.

In 2016 there were 975 837 students enrolled in public higher education institutions. 638 001 students were enrolled in contact mode programmes, while 337 836 were enrolled in distance mode programmes.[iii] This represents a 1% decline in enrolment numbers compared to 2015, mainly attributed to the decline in enrolments at Unisa, a distance mode institution. During this same period, a total of 167 408 students were enrolled in private higher education institutions, representing a 14% increase on 2015 enrolments.

As of 8th July 2018, DHET reports there are 102 fully registered PHEIs, plus an additional 26 provisionally registered private institutions. These 128 private institutions operate across 295 campuses and offer a total of 870 accredited and registered programmes.

88 of these 128 PHEIs (69%) operate from a single campus and only 16% operate more than two campuses. Also obvious is the fact that the majority of these institutions is tightly focused. PHEIs with at most three offerings account for 55% of the total number.



DISTRIBUTION OF PHEI W.R.T. SIZE AND COMPLEXITY

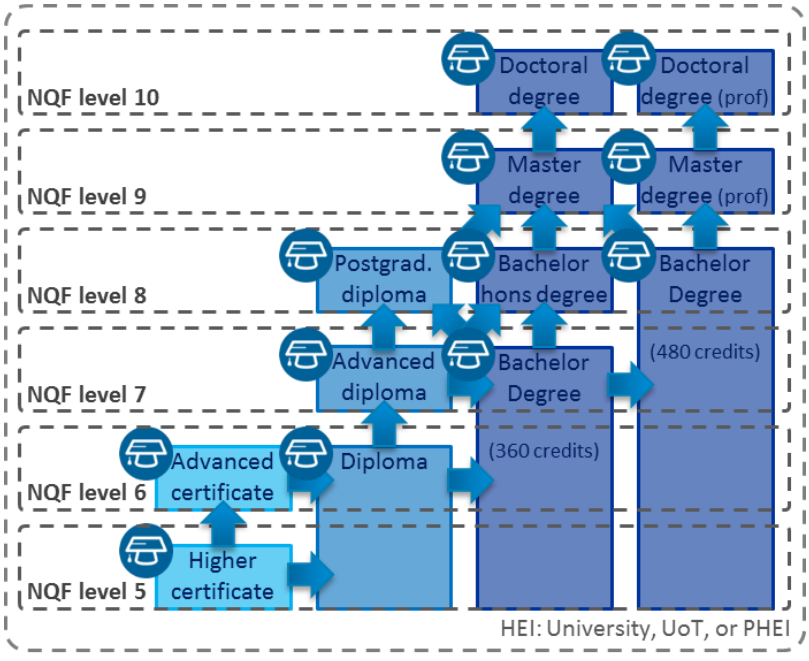
Private post-school institutions help meet the rising demand for post-school opportunities for an increasing diverse society and economy. They assist in diversifying and expanding the post-school sector as a whole. This is particularly so in niche areas where public provision is inadequate or non-existent, for example advertising, design, fashion and theological training for various denominations. Others offer education in business and management, certain artistic fields such as film

and television, information technology, or teacher education. A still small but important type of private provision is education for people with special educational needs, mainly provided in private institutions established and run by associations for people with disabilities.

The private sector includes for-profit and not-for-profit institutions, stand-alone institutions and those located in companies. It includes sizable institutions with several thousand students, and very small institutions with less than a hundred students. Some operate in South Africa but are owned by foreign institutions, which may be public institutions in their home countries. The private institutions are funded by a variety of sources including client contracts, owner's capital, company or SETA training budgets, user fees and donor funds. DHET's position remains that, while recognising and appreciating the role of private providers and provision in the Constitution for public funding of private institutions, its main thrust remains to direct public resources to public institutions.

DHET regulates these institutions through annual reporting and site visits to ensure continued compliance with requirements for registration. A challenge within the quality assurance system relates to the complexity of the existing registration and quality assurance system for private providers, and the sequencing and timing of various processes across the various quality assurance bodies.

CHE is the quality council for the HEQSF. It is the body that maintains this framework and makes all decisions whether to accredit or not to accredit all offerings by HEIs.



HIGHER EDUCATION

The HEQSF nomenclature for qualifications includes certificates, diplomas and degrees, unlike the other two sub-frameworks which use only certificates. The defined qualifications of this sub-framework are shown in the accompanying graphic, as well as the articulation pathways among them. Horizontal articulation may also be

accomplished by credit accumulation and transfer (CAT) to cognate programmes in cases where a student changes to a different qualification before completing the one they are currently enrolled for.

Quality assurance of applications for programme accreditation is performed by an accreditation committee of twenty members. Recommendations are considered by the Higher Education Quality Committee (HEQC), a permanent subcommittee of the CHE, who meets quarterly to consider these recommendations and make formal decisions regarding applications. Decisions may be to accredit, conditionally accredit, or not to accredit any programme.

CHE faces a challenge with regard to capacity. It can, as of March 2018, process 500 applications per year. This leads to extended lead times in processing applications and impacts on the implementation of new programmes.

This problem is exacerbated by the changes to the NQF that came into effect with the introduction of the three sub-frameworks in 2008. All existing higher education programmes had to be aligned with the HEQSF. All institutions had to evaluate their programmes against the HEQSF requirements, classify them and submit applications for alignment.

- **Category A** programmes complied with the HEQSF and were deemed aligned.
- **Category B** programmes could be aligned with the HEQSF through relatively minor modifications.
- **Category C** programmes could not be aligned with the requirements of the HEQSF and had to be phased out or replaced with new programmes.

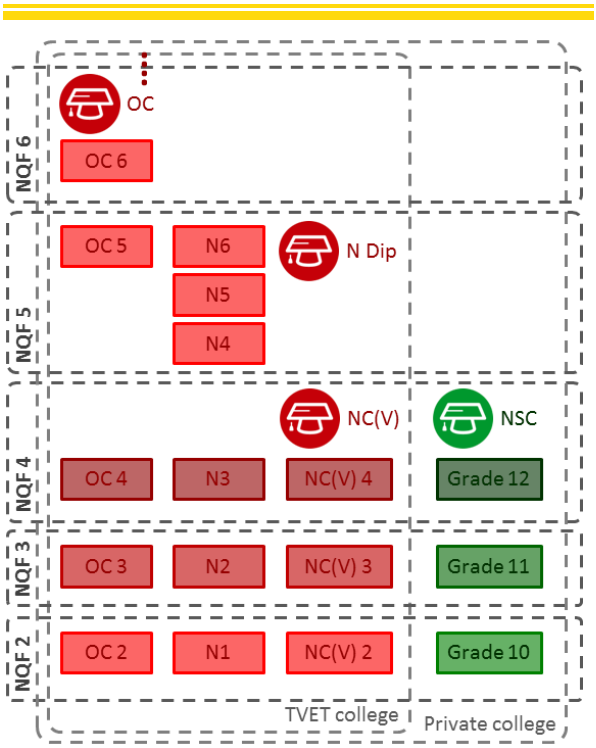
In 2016 the minister of HET signed into law that the last date for enrolment into any category C programme is 31st December 2019. This affects especially the public universities of technology, who offer many diploma programmes not aligned with the HEQSF and did not develop replacement programmes during the first ten years available to do so. As of March 2018, 1 500 applications for replacement programmes were submitted to CHE by these institutions to be accredited. In light of the capacity constraint of 500 applications per year previously mentioned, this additional load strains the resources of CHE and is expected to extend the lead time for processing of normal applications for accreditation even further.

Vocational education and training

There are 50 public Technical and Vocational Education and Training (TVET) colleges with 250 registered campuses for delivery of qualifications and part-qualifications. The colleges provide technical and vocational education and training programmes to learners who completed at least grade 9 at school level. As of 14th May 2018, there are 307 private colleges registered with DHET.

Since 2016, Skills Development Providers (SDPs) also have to register with DHET as private colleges. As of 1st August 2018, 2 041 applications have been received from such providers for registration. These providers have been accredited by QCTO or its delegated agencies and present a current challenge to DHET to register and regulate these institutions as it currently does for higher education institutions.

The **national certificate (vocational)** (NC(V)) is offered at three levels of the NQF (2, 3 and 4) and is an alternative vocational learning pathway to grades 10, 11 and 12 of the schooling system. NC(V) is accredited by Umalusi.



TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING

Report 191 National Technical Education programmes, commonly known as NATED certificates, are part-qualifications that culminate in a **national diploma** on condition that students meet the requirements for work experience. They are offered at six N levels (N1 to N6) for *Engineering Studies* as trimester enrolment and require a minimum of 24 months of applicable work experience or a relevant trade test certificate to obtain the National N Diploma. *Business and General Studies* programmes are offered as semester enrolment at three or four levels (Introductory, N4 to N6) and require 18 months of applicable work experience. Sub-levels N1 to N3 are equivalent to NQF levels 2 to 4 and accredited by Umalusi, while sub-levels N4 to N6 are equivalent to NQF level 5 and accredited by QCTO.

Occupational qualifications and part-qualifications, inclusive of workplace-based learning, are linked to workplace demands and opportunities. Many of the occupational learning programmes are funded by Sector Education and Training Authorities (SETAs) and the National Skills Fund (NSF) through the levy grant system. Occupational qualifications are those qualifications associated with a trade, occupation or profession, resulting from work-based learning and consisting of knowledge, practical and work experience components. These qualifications are accredited by QCTO or a SETA to whom quality assurance is delegated by QCTO.

Additionally, colleges offer skills development and short courses.

There are currently 21 SETAs within the levy grant system. SETAs are required to implement their Sector Skills Plans (SSPs) by facilitating the delivery of improved industries' sector-specific skills in order to contribute to the goals of the National Skills Development Strategy (NSDS). They are expected to ensure that intermediate- and high-level skills are developed among workers as well as unemployed persons. They support workplace-based education and training through learnerships, internships and skills programmes.

A *learnership* refers to a learning programme that leads to an occupational qualification or part-qualification, and includes an apprenticeship and cadetship. An *internship* refers to the structured work experience component of an occupational qualification registered by the QCTO. A *skills programme* is a part-qualification.

Artisans are persons certified as being competent to perform a listed trade, of which there are 125, identified by **Organising Framework for Occupations** (OFO) codes. The **Special Infrastructure Project** (SIP) identifies 14 of these trades as scarce skills. The steps for certification include the completion of a theory component, a practical training component, structured workplace training and trade testing. The NDP indicates that 30 000 qualified artisans should be produced annually by 2030. The current number is 16 000, therefore artisan development has been elevated as a priority area for skills development in the country.

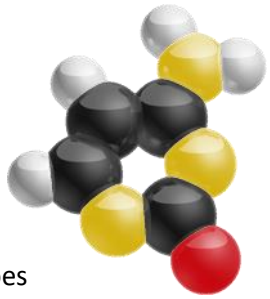
QCTO still experiences challenges with regard to capacity, delegating accreditation of OQSF qualifications to the SETAs and the **National Artisan Moderation Body** (NAMB).

References

Framework	The laws, policies, regulations and guidelines governing the education sector are referenced in APPENDIX C • LEGISLATIVE AND REGULATORY FRAMEWORK on page 85.
Statistical data	Performance data for the education sector may be found in APPENDIX D • NATIONAL EDUCATION AND TRAINING STATISTICS on page 143.
Acronyms	This section abounds with acronyms. They are defined on first use, but may also be found in APPENDIX B • GLOSSARY on page 81.

[i] United Nations (1948). **GENERAL ASSEMBLY RESOLUTION 217 A**, Paris, 10 December 1948.
[ii] Department of Basic Education (2016). **SCHOOL REALITIES 2016**. Pretoria: DBE.
[iii] Department of Higher Education and Training (2018). **STATISTICS ON POST-SCHOOL EDUCATION AND TRAINING IN SOUTH AFRICA: 2016**. Pretoria: DHET.

Chapter 3 Character



This chapter describes Belgium Campus iTversity as an institution in terms of its defining characteristics. This conveys who the Belgium Campus is, what kind of institution it strives to be and the core principles it adheres to in what it does and how it does these things.

Vision

The Belgium Campus's vision statement demonstrates that the institution is keenly aware of the complexities and subtleties of the South African milieu. South Africa is currently in transition, as it transforms itself from a country rooted in colonialism and apartheid to a truly democratic, just and free society.

To transform South Africa into a prosperous region there is a great need for highly skilled graduates who have the right competences, and higher education has a great role to play in this development process. Belgium Campus realises that it has to do things differently from the traditional model that universities operate in. The strategy of a university has a significant impact on regional development through cooperation with industry and business, by educating and delivering the necessary workforce on all different levels.

VISION STATEMENT

It is necessary to provide opportunities and means for all citizens to participate in a fair, equitable, non-racial, non-sexist and democratic society that enables the achievement of individual, group and national ideals. Each citizen needs to be able to not only sustain the survival and security needs for themselves and their families, but to be able to achieve prosperity and success through their own effort and actualise their dreams.

Institutions of higher learning play a vital part in this process, existing as integral parts of their communities and serving the needs of these communities. The Belgium Campus embraces this role and the responsibility it implies enthusiastically and dedicates itself to make a positive difference in the lives of South Africans. The institution's vision is admirable, authentic and achievable. This is satisfying on a philosophical level by striving for beauty, goodness and truth.

Already in this first statement regarding its identity and character, the institution explicitly shows fundamental insight that it cannot rely on any received wisdom of the what and how of higher learning, but has to define itself in a new way in order to achieve the impact it envisions.

The Belgium Campus iTversity thus has a clear vision of what it wants to achieve that serves as the destination for the organisation. This vision is shared by all the members of the organisation and guides the formulation and pursuit of all the institutional artefacts that will be described subsequently.

We know where we want to get to and can now consider how we shall get there.

Mission

The Belgium Campus's mission statement is succinct and declares how it intends to achieve the vision of transformation through education.

> *To supply the industry with highly qualified and experienced Information Technology personnel through the provision of high-quality, practice-orientated education and training of an international standard on a variety of aspects. This will contribute towards economic growth and wealth creation.*
>
> MISSION STATEMENT

Education in itself is, of course, a transformative process. To cite Addison, "*What sculpture is to a block of marble, education is to a human soul*[i] " and is therefore valuable in and of itself. However, the Belgium Campus does not embark on its mission purely for the sake of imparting higher learning. In order to pursue the vision of transforming the lives of the citizens of the country, Belgium Campus chooses its mission as the delivery of higher education that will lead to opportunity through ability for its graduates. This means that the institution must produce graduates who possess the competencies, knowledge, skills and attitudes that are demanded by the current environment. Such graduates will be sought-after by the industry and will be able to succeed as valued employees or as creators of their own enterprises. They will be enabled to prosper, which crucially also leads to the economic growth of the region and improvement for and of the community.

This also provides the rationale for Belgium Campus's choice to focus on the field of Information and Communication Technology (ICT). This field has fundamentally changed the world.

ICT has made computations and optimisations tractable to the extent that solutions may be constructed for a great number and variety of problems faced by mankind. Increases in processing power have made possible new methods of inquiry. The last two decades, for example, saw Wigner's *Unreasonable Effectiveness*[ii] extended to the life sciences as ICT made possible the analysis, mapping, understanding and manipulation of genomes, leading to advances in health with engineered medicines and feeding the expanding population with enhanced crop yields. Such advances are of great importance to a developing country like South Africa.

Universal interconnectedness yields instantaneous communication and unprecedented cooperation and coordination of human activities. Combined with

the embedding of computing devices in more and diverse parts of our material surroundings and the emergence of nonorganic intelligence, we are now able to innovate solutions that are not restrained by technology, but rather the limits of imagination. Specialising in ICT is thus not at all constrictive, but opens the world for our graduates and validates the mission of equipping them with the competencies they need to succeed and prosper.

The Belgium Campus has a well-defined and valid way of reaching its destination.

Values

The core values of Belgium Campus iTversity that define our principles and behaviour in pursuing our mission, are perhaps best summarised by examining our official coat of arms. The different elements symbolise all the core qualities that define the institution.

COAT OF ARMS

The South African national symbols, the springbok and the king protea, immediately signify that Belgium Campus is a truly ***South African*** institution, with its roots in this country and defining itself to be in service of the South African community. The Belgian national colours along the edge of the crest and the lion of Belgium remind us of the origins of the founders, bringing a distinctly ***Belgian*** character to this South African institution. These two equal arms-bearers support and display the crest to the world, as partners in the endeavour of higher education, proudly fulfilling its role among and in collaboration with its ***international*** peers.

The central emblems on the crest show the institution's focus and core activities to be ***higher education***. The pillar represents the core activities of a university of teaching, research and community service. Central is the academic cap bestowed on graduates, signifying the successful accomplishment of the academic endeavour. This position is of crucial significance as it symbolises the ***student-centred*** approach that Belgium Campus follows in all its activities. All decisions and actions are evaluated as to their beneficial contribution to the success of the students, the most important stakeholders in the enterprise.

The star at the base of the column represents firstly the roots of this institution through the star representing Belgium on the flag of the European Union. The star is also internationally recognised as a symbol of ***quality*** and symbolises the striving for excellence in all activities undertaken in pursuit of the Belgium Campus's mission.

The digital representation of the institution's initials in the field of the crest represents Information and Communication Technology (***ICT***), Belgium Campus's area of specialisation. ICT is our field of learning, the technology we use to create solutions and the enabler for superior teaching and learning. It is in our DNA. *It's the way we're wired*. It also connects us with our partners and ***communities***, symbolised by the circular entities on the right of the field, emanating from and surrounding the balls representing any entity. These are the circles we develop around ourselves, the networks we develop and the affiliations that bind us together, further symbolising the principle of ***inclusiveness*** in all our activities.

In today's globally-connected world, nobody flourishes in isolation. Success is achieved and maximised when all parties strive to ensure the success of each other in a spirit of collaboration and ***cooperation***. This is capped of in the coat of arms by Belgium Campus's motto, "*United we conquer*", as we all achieve ***success*** together, symbolised by the flowering of the king protea. The unity leading to this success is finally subtly conveyed by the fact that the coat of arms contains the colours of the national flags of both Belgium and South Africa. The whole shows Belgium Campus to embrace the concept of ***good citizenship***, a value which we live every day and impart to our students as an integral part of their education.

A shared belief system

Artefacts such as visions, mission and value sets are important in defining the character of any enterprise. However, if they merely exist on paper then they do not add real value. To do so, they must be shared by each stakeholder and convey meaning, not just words. They represent the way we think, act and live – what we believe in and what we do as a result.

Belgium Campus actively proselytises its vision, mission and values. They are proudly proclaimed in publications such as prospectuses and information packs, and on the institution's gateways to the information, such as the official website and Facebook page. Every student receives this in their welcome booklet at the start of every academic year and it forms part of the induction training for staff. These beliefs form the point of departure in presentations to prospective students during open days and to partners from industry, government or other academic institutions.

These beliefs often assume a central role in debates when deciding on courses of action or appropriate conduct in various situations. They define *the way we're wired*.

The values of the institution are frequently reinforced through themes. A theme is collaboratively developed by a cross-section of stakeholders to define the ethos for a period of time, often an academic year. The theme is elaborated by the selection of three or four defining words or phrases that guide activities during that period. Students and staff explore the theme during a launch event, often integrated into a day of activities that tie into the thematic components. The theme is maintained in

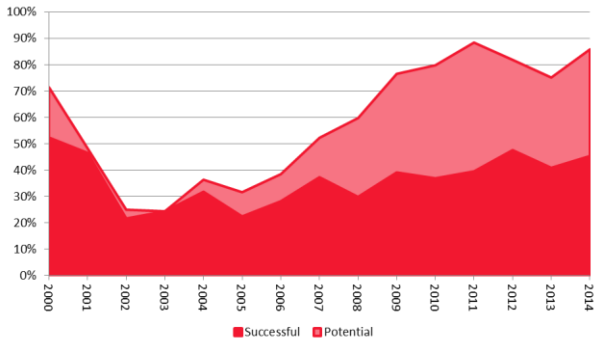
everyone's consciousness through booklets, roadmaps and posters that are displayed throughout the campuses. Themes from previous years include *FutureFIT*, *iSTart* and *Be a Hero*.

Strategies

The institution's strategies represent the ways in which the mission statement is used in order to achieve the vision statement. Goals are stated to specify what needs to be accomplished to implement a strategy. These are achieved by specifying objectives to provide milestones with timelines and planning and implementing initiatives to achieve the objectives.

Maximising student success

It is vital to focus on student success, i.e. on maximising the number of students that complete their academic programmes at Belgium Campus successfully. This challenge is not trivial, particularly in light of the fact that entering students' preparedness for higher education continues to decline due to the challenges faced by the basic education sector. This is particularly evident in science, technology, engineering and mathematics (STEM) disciplines, in spite of government efforts to improve STEM education.



SUCCESS RATES

- Curriculum reviews consider the competencies of entering students and design routes to bridge the gap between basic education's output and the requirements of higher education. This is evident particularly in mathematical and programming subjects, where care is taken to establish the necessary foundations in logical reasoning and problem-solving.
- Bridging programmes are offered to allow entering students the opportunity to upgrade their knowledge and ease the transition into first-year higher education studies.
- Students are supported throughout their time at Belgium Campus in their academic, emotional, social and psychological needs. A dedicated counselling department cooperates closely with the faculty to cultivate student wellbeing.

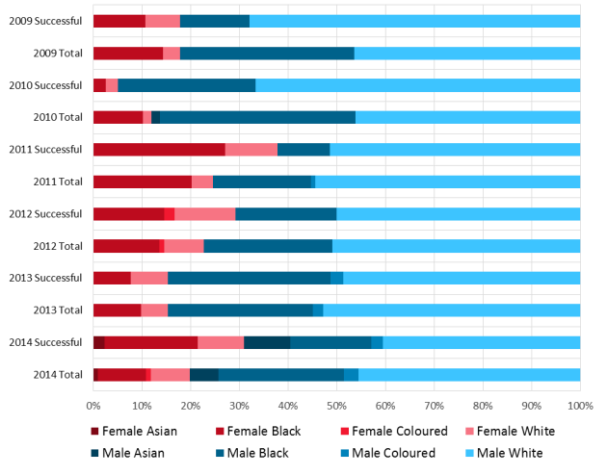
Beyond merely increasing the relative size of the graduating cohort, the Belgium Campus's mission is explicit that its qualifications should lead to work. Graduates must be equipped with all the attributes desired by industry so that they may

immediately find employment, remain employed and flourish because they are valuable assets for their employers.

- Belgium Campus's participative development model for education explicitly considers the needs of all stakeholders in designing, developing and delivering academic programmes. A broad cross-section of industry representatives participate in different forums to provide input on their experience of graduate performance and current and future requirements regarding ICT. This information serves as input to curriculum review processes.
- The cultivation of essential graduate attributes such as professional skills, interpersonal skills, business acumen, leadership and personal autonomy is integrated into the covert and overt curricula to form the kind of graduates who will naturally excel and flourish in the formal employment sector. These graduates have a running start and can add value to their employers from day one without the usual need for additional training.

It is a criterion for reaccreditation of higher education programmes that the profile of graduating classes should increasingly correspond with that of the entering classes. This means that the inequities in the quality of basic education received by learners from different backgrounds need to be overcome by appropriate means to ensure that all students enrolling at the institution have equal opportunities to achieve success.

- Belgium Campus's culture of inclusiveness and equality creates the opportunity for every student to achieve success. Performance is monitored by bodies such as examination commissions to identify any groups that may require additional attention and effort to overcome challenges and reach their potential. The institution's output demonstrates that all demographic groups achieve the same level of performance and success. [1]



PROFILE OF GRADUATING CLASS VS. ENTERING CLASS (B.COMP.)

[1] Detailed data on the relative performance of students from different demographic groups may be found in CHAPTER 12 • PERFORMANCE DATA on page 105.

Widening access

While Belgium Campus's teaching and learning strategy successfully provides equal opportunities for success for all students in a cohort across the demographic spectrum, it is a fact that the profile of entering students does not correspond to the demographics of the region or the country as a whole. Opportunities to pursue higher education are still influenced by major historical inequities with regard to gender, race and geographic location.

- In 2015, Belgium Campus launched an initiative to provide higher education opportunities for female black students from rural areas. This initiative is funded from the institution's own resources. Deserving candidates are recruited with the aid of the *Women in ICT* forum and *Future of the African Daughter* (FOTAD). These students are mentored to ensure they make the most of an opportunity not available to the vast majority of their demographic group.

There is a paucity of opportunities for disabled individuals to pursue learning and gainful employment. Deaf individuals, in particular, had prospects restricted to vocational training but did not have access to higher education.

- In 2014 Belgium Campus embarked on a project to become the first South African institution to offer a higher education programme for Deaf students. Since theirs is not only a physical disability, but also a linguistic one, and due to the fact that these individuals undergo schooling in special-needs schools rather than the regular basic education system, extraordinary measures needed to be put in place. A curriculum was designed, sign language interpreters employed and classrooms with custom layout constructed. The first cohort commenced their studies in 2015 and the first graduates are expected in the 2019 graduation ceremony.

Due to economic and social realities, many individuals are not able to pursue full-time studies because they are breadwinners who must necessarily work. These individuals have the capacity to learn, as evidenced by their employment in industry, but not the opportunity. Belgium Campus desires to provide this opportunity. Additionally, the pursuit of higher education is often simply beyond the means of many South Africans.

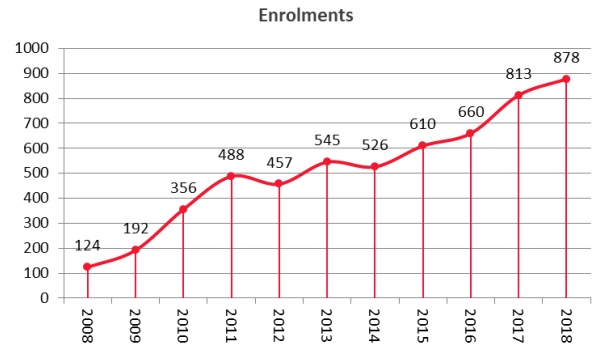
- The curriculum of the Bachelor of Information Technology was adapted to create a programme that is delivered part-time, over five years rather than the three of the full-time equivalent. Students attend classes on Saturdays, enabling them to work during the week, while still receiving the benefit of education through contact mode.
- The Belgium Campus strives to remove affordability as a constraint to pursuing education. As a private institution, it receives no subsidies or funding from government that public universities benefit from. The institution actively

pursues relationships with South African public entities; such as the Department of Science and Technology, Department of Trade and Industry, and National Skills Fund; and the Belgian government and corporations to solicit funding that may be applied towards bursaries or scholarships for deserving candidates who lack the means to finance their own studies.

- Specialised and customised programmes are constructed to serve the requirements of individual South African enterprises. This encourages these companies to invest in the education of students, since these students will possess the specific knowledge and skillsets that make them valuable employees for the companies. In this way, Belgium Campus addresses the paradoxical reality that South Africa experiences both a great skills shortage and high unemployment.

Increasing output and improving throughput

Belgium Campus makes a major contribution to higher education in information and communication technology (ICT), currently yielding 8% of ICT graduates nationwide. An objective has been set to increase the size of the student body to 2 500 by 2021. In order to achieve this, it is necessary to expand the institution's footprint and establish campuses in other geographic areas.



ENROLMENT HEADCOUNTS

- All students cannot come to the Tshwane campus for their education and the capacity of this campus can also not be arbitrarily enlarged. Therefore, it is a better solution to take Belgium Campus's high-quality education to them. Daughter campuses were established in two other metropolitan areas to serve the needs of these areas. The Ekurhuleni campus opened its doors in 2016 and has grown rapidly, with the Nelson Mandela Bay campus that started in 2018 hopefully achieving similar growth and success.

The goal of successfully producing graduates must be accompanied by a drive to improving throughput in the sense that increasing numbers of students should complete their programmes in the minimum time required. Dropout rates need to decrease and impediments to completion, often single items such as completing in-service training or theses, must be addressed and removed.

- All resources must be focused on living the core value of student-centricity elaborated earlier. Students are guided, mentored and coached to pursue

excellence in their endeavours. Intervention through counselling is enacted when challenges or impediments are encountered. Early warning is essential for this to be effective and is achieved through continuous monitoring and close interaction between faculty, counsellors and the student body collectively and individually.

Serving the community

As stated in the institutional vision, the Belgium Campus is an agent for transformation in South Africa. As a good citizen and a responsible higher education institution, it is essential to align teaching and research activities with initiatives that serve the needs of the community.

- Research and innovation activities must aim to address the needs of the institution's neighbouring communities, regional and national objectives. Botlhale Village was established as an entity to foster and coordinate these goals. This focuses energy and resources on activities that will be of benefit to and thereby serve the community. These goals are closely aligned with the institutional vision of transforming South Africa into a prosperous region. The value of service to the community is further instilled in all students through the entrenchment of community service projects into curricula.
- Winter schools are presented annually at all three campuses for grade 11 and 12 learners in Mathematics, Information Technology and Computer Applications Technology as per the national curriculum determined by Umalusi. These events are offered without charge to any learners who wish to attend and aim at improving learners' performance at school by supplementing their school learning during the mid-year school holiday period. Feedback received from learners, schools and representatives of the Department of Basic Education indicates that this initiative is bearing positive results and a significant, well-appreciated impact on learners' insight and subsequent results.
- In 2014 Belgium Campus launched an initiative to train secondary school teachers for ICT-related subjects. Twenty-four students annually follow programmes where their normal bachelor degree curricula are expanded to include 60 additional credits of pedagogical subjects. This contributes to alleviating the shortage of qualified, competent teachers available to the basic education sector.
- The institution needs to regularly upgrade and replace its computer infrastructure in order to keep up with rapid developments in this domain. Equipment which is no longer employed by the campus is donated to schools that lack sufficient infrastructure. These computer and network resources are also installed at and the necessary support provided to the recipient schools.

Expanding horizons

There exist multiple avenues by which Belgium Campus may achieve its mission of providing quality higher education that leads to gainful employment. The institution explores different ways in which to expand its educational activities and implements these as feasibility allows.

- The Bachelor of Information Technology at NQF level 7 was introduced in 2015 to provide a better custom-fit option for students' abilities. This supplemented the available programmes existing at NQF levels 6 and 8 before. The institution envisages providing additional options that expand its coverage of the Higher Education Qualifications Sub-Framework (HEQSF) of the NQF. Higher certificates at NQF 5 will provide opportunities at the lower end of the HEQSF. Post-graduate diplomas at NQF 8 offer avenues for continued study as well as an articulation pathway from NQF 7 bachelor degrees to a cognate master degree at NQF 9.
- New specialisation streams within existing programmes are possible and in fact required as the institution adapts to the rapidly-evolving field of ICT with new technologies emerging that create whole new career options.
- All of the institution's programmes are currently delivered through contact mode. This enables the individual attention and focused activities that result in high-quality education and superlative results. Distance education has the potential of greatly enlarging the number of students that may be reached and who may benefit from Belgium Campus's unique approach to higher education. Such an initiative may be launched if technology may be exploited to such a degree that this mode of delivery will provide an equivalent learning experience to that enjoyed by students attending on-campus contact programmes.

Primary challenge

It is undeniably evident that Belgium Campus iTversity has high ideals and has set itself ambitious goals. The primary challenge in realising these goals and pursuing the mission through the diverse strategies is, of course, the availability of sufficient resources to fund these activities. As an independent private institution, Belgium Campus does not receive any state funds like the subsidies allocated to public universities. Belgium Campus engages in continued interaction with various parties to solicit their financial support as partners in engineering transformation in South Africa.

References

Shared vision

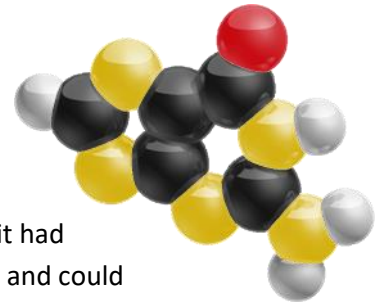
The vision and mission of the institution is shared publically via the website and Facebook as

	identified in APPENDIX A • ADMINISTRATIVE INFORMATION on page 79.
	This information is also shared in prospectuses, information packs and other artefacts available for inspection.
Thematic programmes	A selection of artefacts from thematic programmes employed to share the institutional values are found in THEMES.ZIP.
	Reports on events where themes were shared are found on the institution's Facebook page and YouTube channel, identified in APPENDIX A.
Botlhale Village	Botlhale Village's role and impact in serving the community is discussed in CHAPTER 9 • BOTLHALE VILLAGE on page 97.
Student financial aid	Records of financial aid through bursaries, scholarships, learnerships and sponsorships are available for inspection.
Achievement of strategic goals	Data illustrating the success of institutional strategies regarding enrolment numbers, success rates and social justice may be found in CHAPTER 12 • PERFORMANCE DATA on page 125.

[i] Addison, J. (1711). THE SPECTATOR, No. 215, November 6, 1711.

[ii] Wigner, E.P. (1960). "The unreasonable effectiveness of mathematics in the natural sciences. Richard Courant lecture in mathematical sciences delivered at New York University, May 11, 1959". COMMUNICATIONS IN PURE AND APPLIED MATHEMATICS, 13(1): 1–14.

Chapter 4 Governance



Belgium Campus started in 1999 with 6 students and may be described as a micro institution at that time. It was feasible to operate as a family business. By 2009, it had grown to a small institution with 200 students enrolled and could comfortably be managed by a small team. In 2018, with student enrolment exceeding 800, Belgium Campus is growing into a medium-sized institution and plans to increase enrolment number to 2 500 students by 2021.

The institution is currently situated at the cusp between being small enough to manage centrally with a select group assuming all authority and being large enough to require the employment of more sophisticated structures and processes with appropriate delegation of authority. The need for restructuring has been highlighted by the exigencies of managing three sites of delivery since the establishment of satellite campuses. The Ekurhuleni campus is less than an hour's drive removed, but the Nelson Mandela Bay campus requires flight. Strict centralised control is evolving from challenging to infeasible, adding urgency to the need for restructuring the organisation and reengineering the way it executes its functions.

Organisation

This section describes the current form of the institution. It should be borne in mind that Belgium Campus is currently engaged in a critical reevaluation and redesign exercise that may result in changes to the structure described here.

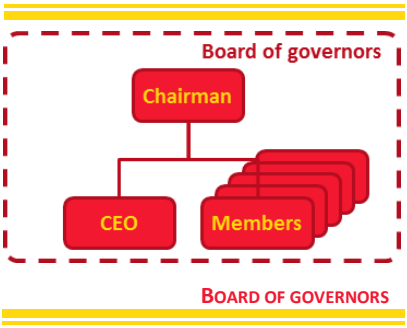
ORGANISATIONAL TIERS

The organisational structure may be broadly segmented into the tiers indicated in the accompanying diagram. While the structure and reporting lines display a vertical character, processes have a horizontal character that cut across the usual tree-shaped structure or the organisation as they often involve multiple departments' activities and require coordination among these.

Strategic management

The ***board of governors*** consists of seven members who provide strategic direction to and exercise oversight of the Belgium Campus. The board meets annually led by its **chairman**, unless circumstances dictate the necessity for extraordinary meetings. The **chief executive officer** (CEO) of Belgium Campus serves as a board member and in

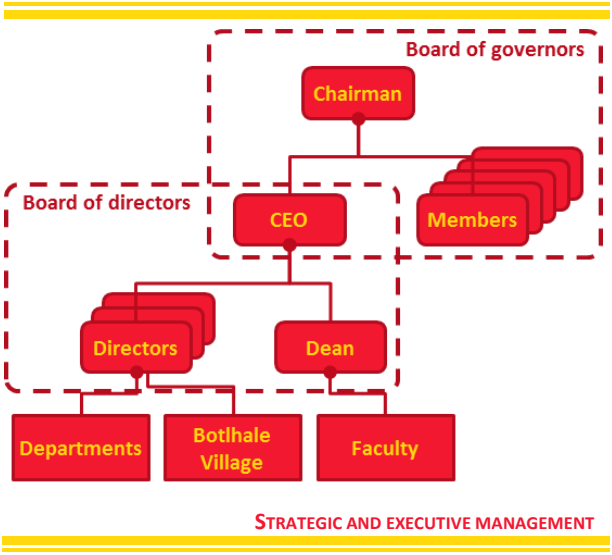
this capacity receives the board's strategic instruction and reports on the discharge of responsibility by Belgium Campus directors.



The board of governors also engages in periodic strategic planning sessions where it critically evaluates the state of the institution, determines strategy and issues directives with regard to organisational structure and execution of functions. These decisions launch actions such as the strategic initiatives discussed in the previous chapter, determine the necessity of organisational and functional redesign and mandate the CEO to pursue courses of action to achieve the mission of the institution. This body represents the custodian of the character of Belgium Campus iTversity.

Executive management

The CEO heads the ***board of directors*** to lead the implementation of the institution's strategies through various initiatives and projects. Initiatives represent new directions and endeavours that become formally part of the institution's character and operations, while project represent finite (in duration and scope) activities undertaken by the institution.



The members who serve under the CEO on the board of directors are:

- The **Director: Operations** is responsible for all administrative and operational functions, including human resources, finances, student enrolment and administration, accommodation and food services, infrastructure, events and marketing.
- The **Director: Research and Development** is responsible for the coordination and oversight of research and innovation projects, for these activities in the institution's academic programmes as well as conducted through the Botlhale Village innovation and development hub, of which this member is the executive director.

- The **Director: External Relations** is responsible for interaction with external parties to pursue opportunities with public and business entities, cultivating and maintaining relationships and coordinating these entities' participation in bursary and learnership programmes.
- The **Dean: Faculty of Information Technology** is responsible for management of the faculty, students, academic programme development and maintenance, delivery of educational offerings, including the monitoring and evaluation thereof, and student support services.

The board of directors meets monthly to execute its duties with regard to fulfilling the mandate of the board of governors.

Policy and practice

The directors decide what the institution will do and how this will be done. Towards this end, policies and formulated, approved and promulgated. Directors also exercise control to ensure that policies are enacted by monitoring and evaluating the performance of the institution's constituent parts and the institution as a whole. Corrective actions are selected where necessary and directives issued to ensure that these are implemented.

Operational Management

Directors are responsible for executing policy within their ambit. They formulate procedures to enable and ensure that policy is implemented and manage the operations through their deputies, heads of department and representatives.

The operations of the various departments are coordinated through monthly interdepartmental meetings to facilitate the efficient and effective performance of business processes, since such processes in general span several areas of control and require articulated cooperation between departments. An additional vital aspect to manage is that Belgium Campus is distributed over three campuses, where the same services must be delivered through the execution of operational processes.

Language policy

South Africa has eleven official languages belonging to various language families. Although English is not the home language of the majority of South Africans, the institution's language policy provides the rationale for selecting English as the common tongue for Belgium Campus operations, including instruction.

South African Sign Language (SASL) is granted special status, as unlike hearing individuals of different linguistic backgrounds, profoundly Deaf individuals' physical disability prevents them from ever communicating using English in the articulated modality. Written communication will always utilise English.

Quality assurance

Belgium Campus iTversity has set itself a goal of becoming a *trademark* that is associated with quality. This encompasses:

- Quality in education, including offerings and delivery,
- Quality in day-to-day operations,
- Quality graduates, and
- Quality in applied research.

To attain this goal, quality must arise from within.

Through strategic management, Belgium Campus management is of the opinion that education is in transition and will remain so. Belgium Campus must remain at the forefront by living the following principles:

- Education must be delivered better every day.
- Educational offerings must evolve every day.
- Education must produce well rounded graduates who are ready for every day's changing requirements.

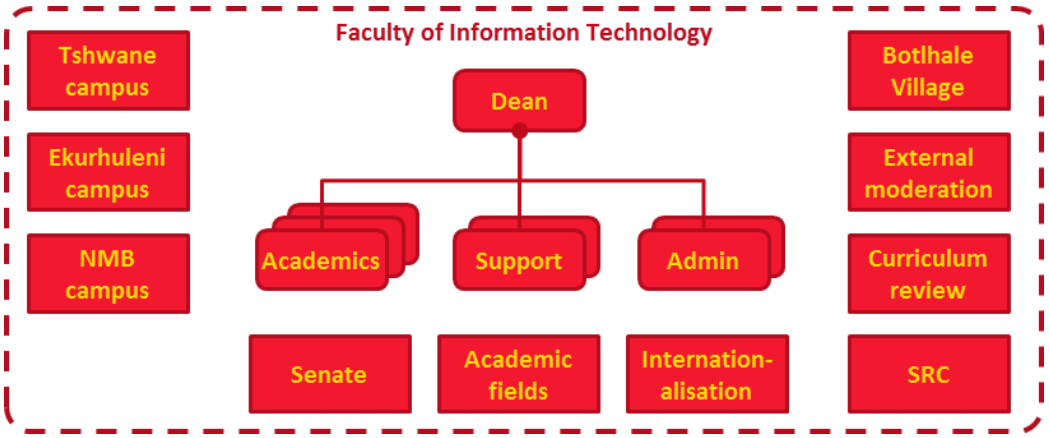
To achieve this goal, we must pursue excellence in everything we do. To instil the **Belgium Campus™**, the *FutureFIT* thematic programme was launched in 2012 for all students and staff to ensure that everybody breathes together in order to breed excellence. This programme expanded on the 2011 initiative *United We Conquer* and was succeeded in 2013 by the *iStart* theme and after that by themes such as *Connect*, *Inspire Your World* and *Be a Hero*. These themes are essential to achieve the vision Belgium Campus™, as quality assurance policies and procedures must be implemented by people who believe in the common vision.

Belgium Campus has policies and procedures to operate a valuable higher education institution. This means that for the entire lifecycle of this Campus, a higher education institution and positioned where it wants to be, different policies and procedures are available to ensure its proper running. At the same time, policies and procedures are evaluated, questioned and criticised to ensure their effectiveness when judged against the changing environment. Discipline in adhering to policies and following procedures creates an environment with predictable and measurable outcomes.

As Belgium Campus™ has become a *trademark* within; management, staff and students live and conduct their work and studies in the spirit of this trademark, share the common vision, and have tools at their disposal to aid them. Everyone is responsible to contribute to the pursuit of the goal and share the success.

Faculty of Information Technology

Belgium Campus iTversity currently consists of three campuses in different metropolitan areas of South Africa. Academic operations are conducted in these three campuses as a single faculty distributed over these three campuses, offering the same academic programmes, implementing common policies and procedures, and delivering the same quality education and student experience at all locations. All references to the faculty should thus be read as encompassing all campuses.



FACULTY OF INFORMATION TECHNOLOGY

The faculty is led by a dean, supported by head lecturers and deputy head lecturers. Oversight of faculty operations rests within the ambit of the senate.

The academic faculty members may be categorised vertically by seniority level and horizontally by their fields of specialisation. They are responsible for instructional design, delivery of modules and creation of instructional materials.

Student support refers to tutoring, mentoring, guidance and counselling to maximise academic performance and looking after students' emotional, social and psychological needs. The faculty, counselling department and student representatives' council are partners in these endeavours.

The faculty collaborates with Botlhale Village to ensure that undergraduate programme activities involving research, innovation and development serve the needs of the community and yield concrete benefits.

Engagement with the industry is facilitated through different forums:

- The **Business Forum** meets annually to discuss requirements and provide an opportunity to solicit input regarding the curriculum. This entails academic content, professional skills and information on the latest technical platforms, products and frameworks exploited by businesses. This allows integration of these components into the curriculum in order to produce graduates that fit

the profiles that the corporate world seeks to recruit. These activities are essential in ensuring that the institutional mission is achieved by equipping graduates with the competencies that will ensure employment.

- Businesses that sponsor students at Belgium Campus through bursary or learnership programmes meet with the faculty on a quarterly basis. This serves as platform to discuss and evaluate student progress in academic programmes or with in-service training or theses; and monitor and address any issues related to students' emotional wellbeing.

Operational support services

Various departments are responsible for providing services to the institution across its campuses. These services include:

Accommodation: Residence management	**Administration**: Student lifecycle management, reception, public interface	**Cleaning services**: Cleaning of offices, residences and other facilities, garden maintenance, and laundry
Counselling: Wellbeing of staff and students	**Finances**: Budget management, accounting, taxation, collections, and payment to suppliers	**Food services**: Kitchen, cafeteria, boarding students' meals, and event catering
Human resources: Personnel management, recruitment, payroll, pension fund, and medical aid	**Libraries**: Physical and electronic reference materials	**Marketing**: Branding, corporate image, advertising, promotion, event planning and facilitation, and student recruitment
Physical infrastructure: Construction, renovation, and maintenance of buildings, grounds and facilities	**Print services**: Printing, binding and supply of textbooks and other instructional materials, marketing materials and information packs	**Quality**: Monitoring and audit of processes, quality assurance, and risk remediation
Safety and security: Safeguarding of premises, resources, personnel and students against physical threat or loss, occupational health and safety	**Systems**: Creation and maintenance of software systems to support institutional operations	**Technical infrastructure**: Installation, maintenance, and upgrade of computer and networking resources, including safeguarding systems and information against unauthorised access and malicious attack

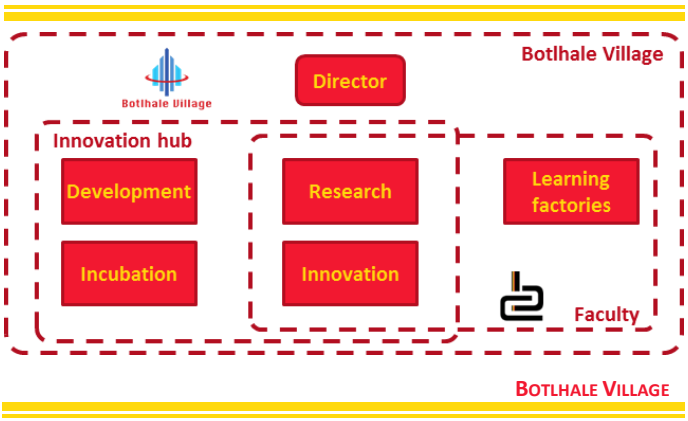
Student representative council

The student representative council (SRC) is responsible for representing the interests of the student corpus and act as the primary interface between the institution and the students. The SRC organises social events and in this way contributes to the wellbeing of students by meeting their social needs for activity and belonging.

SRC members are elected from every class to serve for a period of one year. The SRC president is appointed by the campus and selects board members for the various portfolios of the SRC board.

Botlhale Village

Botlhale Village was established in 2016 as a separate entity that exists in close cooperation with Belgium Campus iTversity. The functions of Botlhale Village may subsequently be categorised into two broad categories, the service it provides to Belgium Campus internally and its independent activities conducted with external entities.



- Internally, Botlhale Village strengthens and enriches Belgium Campus's functions as an institution of higher learning with regard to research and community service. Botlhale Village works closely with the Faculty of Information Technology to facilitate student research activities and innovation projects that serve the needs of and are of benefit to the community. This is in line with the Belgium Campus vision of contributing to the transformation of South Africa and the strategy of serving the community, as discussed in the previous chapter.
- It is envisioned that Botlhale Village will also play a vital role with regard to these activities when Belgium Campus introduces graduate programmes in the future.
- Independently, Botlhale Village develops software products and systems on behalf of external entities such as KU Leuven and the City of Tshwane. These bespoke systems fulfil the needs of these entities by employing and exploiting the strengths of Belgium Campus in ICT.
- As an innovation hub, Botlhale Village hosts the incubation of small business enterprises. Its development efforts also spawn opportunities to spin off new

entities from the products and experience gained during development. It acts to establish and maintain intellectual property that may be exploited during these endeavours.

Organisational and functional design

The exigencies of growth in student numbers and expansion into multiple campuses necessitated an evaluation of the fitness and efficacy of current processes, structures and resources to serve current and projected future requirements. An executive decision was made to launch an organisational and functional design (OFD) project to create new organisational artefacts for Belgium Campus iTversity. This project commenced mid-2018.

An ancillary project was launched simultaneously to create a new quality management system (QMS) that will be custom-built to support and enable all the institution's processes.

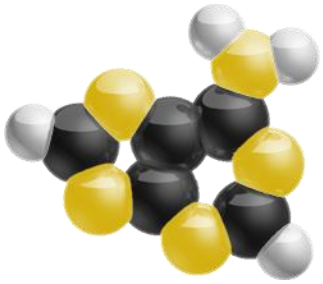
Primary challenge

The primary challenge in executing good governance is to ensure excellent service to all stakeholders, but especially to the students. Students should be able to focus on their academic pursuits and student life without any distraction. Towards this end, it is essential to have efficient, defect-free processes and systems in place. The ideal system is the one that you forget is there because it simply works. This is currently a challenge, which may be ascribed to rapid expansion and the new realities of operating across geographically-separated campuses. Belgium Campus iTversity is currently engaged in a formal operations and functional design project which will not only design the optimal enterprise, but also engineer a new quality management system to implement the design and enable the envisaged enterprise.

References

Policy	Current policies are included in the attached file named **POLICIES.ZIP**.
	Educational policies are accessible from the institution's website.
Organisational and functional design	The artefacts associated with the current OFD project are available for inspection.
Botlhale Village	More information on Botlhale Village may be found in CHAPTER 9 • BOTLHALE VILLAGE on page 97.
Internationalisation office	The goals and functions of this office are described in CHAPTER 11 • INTERNATIONALISATION on page 115.

Chapter 5 Academia



A higher education institution has three main functions. First, it educates and provides people with high-level skills for the labour market (*teaching*). Second, it produces new knowledge, assesses and finds new applications for existing knowledge, and validates and valorises knowledge through its curricula (*research and innovation*). Third, it provides opportunities for social mobility and strengthens social justice (*community engagement and service*).

Qualifications

Belgium Campus iTversity offers programmes for the qualifications listed below. All these qualifications are accredited by the ***Council on Higher Education*** (CHE), registered by the ***Department of Higher Education*** (DHET) and listed by the ***South African Qualifications Authority*** (SAQA) on the **Higher Education Qualifications Sub-Framework** (HEQSF) of the **National Qualifications Framework** (NQF).

	NQF level	Credits	Duration (years)	SAQA identifier
Bachelor of Computing	8	506	4	62689
Bachelor of Information Technology	7	360	3	94121
Diploma in Information Technology	6	388	3	62621

QUALIFICATIONS

Bachelor degree of Computing

The ***Bachelor of Computing*** degree enables students to apply theories and integrate them in real-world environments, across multiple disciplines, by applying best practices to create innovative solutions. The ***B.Comp.*** curriculum contains the theoretical foundation for the conceptualisation and modelling of solutions and the use of abstract, analytical and critical thinking. It refines the student's ability to recognise and solve problems.

Practical assignments and projects completed in this degree are congruent with practices in the daily work world, so assessment is always done with both academic content and practical implementation in mind. This means that students acquire business-specific and soft skills, including communication skills, customer satisfaction training, the ability to work as a team member/team leader, and the ability to teach others. During the final year, students complete internships at local or international companies, perform academic research and present their findings in formal dissertations. There are currently two specialisation streams available.

Specialising in **Business Intelligence** empowers students with in-depth knowledge of the processes and techniques used to transform data into information, which is essential for effective decision-making that results in benefits to enterprises. Students learn how to collect and organise data into large-scale data stores and warehouses. Valuable information is extracted from the available data by exploitation of the fast-growing discipline of data mining. As information specialists, these graduate employ mathematical and statistical analyses to generate value for companies and effectively present results in diverse forms to relevant stakeholders.

The **Software Engineering** specialisation stream teaches students to employ a disciplined, systematic, quantifiable approach to design, develop and test software products and systems. Knowledge and skills from many different domains are combined to create novel solutions that are usable and useful. The needs of people, businesses or organisations are analysed and solutions designed to meet these needs. This requires ingenuity. Designs are used to develop products that deliver the things required, combining components into complex systems, verifying and validating that everything works correctly and deploying the solutions so that they may be used. This requires discipline, technical knowledge, practical skills and the ability to mobilise teams of people to work on the goals together. Products must be clever and do useful things, they must be delivered in time to satisfy the needs that caused their construction and everything needs to be done in such a way that it is affordable to undertake the task. These graduates solve problems, are rigorous and precise to ensure predictability and correctness, identify and mitigate risks, implement controls and manage processes and people.

Bachelor degree of Information Technology

The ***Bachelor of Information Technology*** is a valuable qualification that is sought after by employers needing IT professionals that stand out among their peers. ***B.IT.*** graduates' understanding of software systems enables them to create software solutions meeting the expectations of their employers and customers. The curriculum, focusing on **Software Development**, is designed to provide the graduate with a deep understanding of all the relevant aspects of modern software development. The software, tools and technologies chosen to teach the practical application of the theoretical foundations are the latest instances which the graduate can expect to encounter in the work environment. In the working world, these graduates will typically start as part of a team and receive programming instructions from system architects, software engineers or system designers.

Diploma in Information Technology

The ***Diploma in Information Technology*** qualification develops core competency in a single discipline, allowing students to acquire new skills quickly to launch a career. The ***Dip.IT.*** programme consists of a foundational component that gives insight into the field of IT and a specialisation component.

When specialising in **Software Development**, students become highly-skilled programmers proficient in various programming paradigms. They develop applications to be deployed on desktops, networked computers, the internet and portable devices. After graduation, they typically work as part of a team that turns the designs and programming instructions received from system architects, software engineers or system designers into working software programmes that satisfy the requirements of the parties who commissioned it.

The **Infrastructure** specialisation stream focuses on training future system and network administrators, responsible for installing, maintaining and upgrading networked computer devices, servers and mobile devices along with the wired or wireless networks that connect them all together. They work to ensure that users can access the resources they require on the network, internet or in the cloud, while safeguarding the intellectual property of individuals and companies and protecting resources from malignant intent.

Curricula

The value of Belgium Campus's academic offerings rests on the strength of the curricula of its academic programmes. These academic artefacts are developed taking cognisance of the needs of all stakeholders in the ecosystem. Curricula are not static artefacts – as the needs of stakeholders evolve, academic offerings must change accordingly in order to ensure that Belgium Campus will continue to achieve its mission.

Stakeholders

The Belgium Campus developed and uses a **participative development model** to ensure that its graduates are employable and will remain employable. This model requires the active participation of different stakeholders and addresses their needs through the design of appropriate programmes.

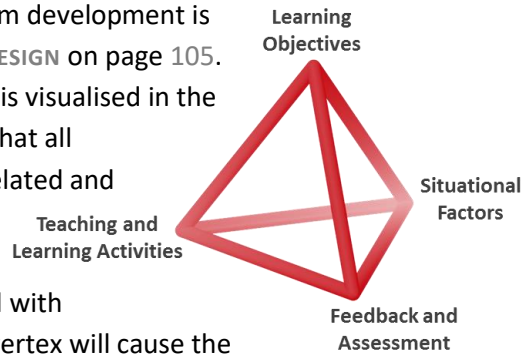
- The industry, specifically information and communication technology businesses and all enterprises relying on such technology to support and enable their business activities, require increasing amounts of skilled professionals. Employees must possess more than mere technical ability, they must understand the business to add value to it and effectively utilise soft skills in communication, persuasion and negotiation. A programme must output graduates that master the technical requirements of the business and are well-rounded professionals with high ethical standards and work capacity. Programmes must be developed to nurture all these aspects through their explicit and hidden curricula.
- Students enter higher education with varying levels of academic background, intellectual ability, aptitude and personality. Students follow learning

programmes with the goal of achieving qualifications that will enable them to find gainful, rewarding and permanent employment. Programmes must be developed to bridge the gap from basic education to higher education effectively and then to mould the student into a graduate possessing the characteristics that make them desirable to employers.

- The academic world specifies requirements regarding depth and breadth of knowledge imparted, cross-disciplinary inferences and solid theoretical and scientific grounding. Programmes must always be developed so that the outcomes of the programme satisfy the requirements of the academic qualification that the programme is designed for. Programmes must articulate into employment but also into further study at this institution or any other institution of higher learning.
- The context and place in which the institution operates and for which it produces graduates exhibit unique, but diverse, requirements. The institution must take cognisance of the socio-economic needs to the region, province and country and those of its public and private enterprises and citizens when developing learning programmes. Programmes must output graduates who are able to address these needs and attempt to impact the environment positively through the choice of syllabus content that produces these results during the execution of the programme.

Design

The design model employed for curriculum development is presented in CHAPTER 10 • CURRICULUM DESIGN on page 105. An important characteristic of the model is visualised in the representation on the right. This shows that all components of the curriculum are interrelated and that congruence between the components must be maintained. All components must be present and aligned with each other; removing or weakening any vertex will cause the product to *fall flat*. The referenced chapter also provides an overview of the curriculum design process.



Internationalisation

The internationalisation of higher education has grown over the past two decades, and is a reflection of globalisation as well as South Africa's return to the international community. It takes various forms, including: cross-border mobility of students and staff; international research collaboration; the offering of joint degrees by universities in different countries; the establishment of campuses by universities outside their home countries; the growth of satellite learning and online distance education,

including online educational institutions; arrangements between countries for the mutual recognition of qualifications; the regional harmonisation of qualification systems; and the increasing inclusion of international, intercultural and global dimensions in university curricula.

INTERNATIONAL ACADEMIC PARTNERS

Crucially, in the current atmosphere of renewed calls for the decolonisation of education, Belgium Campus is an equal partner with its international peers. While the academic content of ICT is not vulnerable to such criticism to the extent that other disciplines such as law, medicine or philosophy experience, the way in which teaching, research and community service is conducted must remain sensitive to the African identity of the country and the institution. Belgium Campus engages in the following activities in its pursuit of internationalisation in higher education:

- Agreements with international partner institutions enable mobility for students and academic staff to complete a part of their programme at a foreign university. Belgium Campus reciprocates by hosting students from these institutions at the main Tshwane campus while they complete part of their programmes in South Africa.
- Undergraduates participate in joint virtual mobility programmes with students from KU Leuven and Penn State universities.
- Belgium Campus hosts programmes during the autumn holiday where local students and visiting students from international partners work on joint projects in areas such as smart cities and smart farming.
- Students may elect to perform their in-service training at Belgian corporations to gain exposure to the wider world and experience working life in a foreign country.
- Membership in Erasmus Mundus programmes such as ema2sa and Eurosa enables Belgium Campus graduates to pursue master degree studies at top European universities.

- As a member of the Pascal initiative, Belgium Campus hosted this organisation's annual conference in 2017, providing its students with the opportunity to participate in formal academic conference proceedings.

Extracurricular programmes

Belgium Campus iTversity enters into agreements with various global software and solutions enterprises to deliver added value to its students. University alliance programmes with companies like IBM, SAP and Infor exposes students to the products and training of these entities and gives them the added advantage of working with leading-edge tools that they are likely to encounter when they enter into employment with large companies. Trainers from these companies from around the world deliver courses to Belgium Campus students during the holiday periods. Students also have the opportunity to achieve certification by these companies if they pass the requisite examinations.

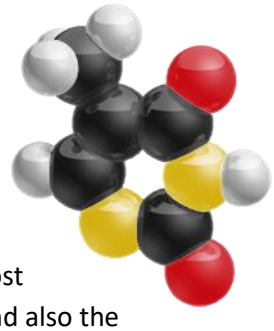
Primary challenge

The primary challenge to academic endeavours in ICT is the dynamic nature and rapid developments in this field. The current leading edge of development, often the cause of the latest disruptions to existing models, is often in an area not envisioned ten years ago. To remain relevant, Belgium Campus must continuously remain aware of emerging technology and judge its impact accurately, so that new areas may be identified and incorporated into curricula in time to equip students with the latest knowledge and skills they will need when they graduate. This requires staying up to date, the ability to predict future development and an ingrained culture of lifelong learning to stimulate these efforts.

References

Programmes	The Bachelor of Computing programme is described in CHAPTER 8 • BACHELOR OF COMPUTING on page 89.
	Information on the Bachelor of Information Technology and Diploma in Information Technology programmes is available for inspection.
Curriculum design	The curriculum design process is elaborated in CHAPTER 10 • CURRICULUM DESIGN on page 105.
University alliance programmes	Information regarding extracurricular programmes from IBM, SAP and Infor is available for inspection, including programme content, participation, success and certification.
Internationalisation	The goals and activities of the internationalisation office and its impact on the curriculum are

	discussed in CHAPTER 11 • INTERNATIONALISATION on page 115.
Partnerships	The memorandum of understanding establishing a consortium with UCLL, CPUT and UniVen is available for inspection.
	The memorandum of agreement for institutional and community development with UCLL is available for inspection.



Chapter 6 Teaching

In order to pursue the institutional mission of producing highly-competent graduates that are sought after by and valuable to employers, it is necessary to maximise the learning achieved by students. Thus it is claimed that teaching is the most essential component of Belgium Campus iTversity's activities and also the single component whereby this institution distinguishes itself from its peers.

Vision

Belgium Campus envisions delivering exemplary education through optimal instruction. The achievement of this vision is pursued through several components, explicitly elaborated to ensure a shared vision. This vision of exemplary instruction is discussed in CHAPTER 13 • TEACHING AND LEARNING STRATEGY.

Academic staff development

Belgium Campus actively encourages and facilitates the development of staff members' knowledge and skills in their academic areas of specialisation and in pedagogy.

The institution sponsors any studies undertaken that will enhance a member's competencies and benefit the campus by increasing the value of that individual. Several faculty members are engaged in studies through other institutions such as Unisa to pursue advanced studies. Belgium Campus funds these studies and is reciprocated through retention agreements that ensure that these activities benefit the institution.

Academic staff members are nominated to undergo training and become certified as assessors and/or moderators and are registered as such on the NLRD maintained by SAQA.

Internal staff development is facilitated by a programme running throughout each academic year wherein faculty members are trained by experts from different fields and perspectives in topics such as class management, teaching multicultural student cohorts, pedagogical techniques for teaching, assessment and moderation, and addressing the needs of students with special needs. Regular class observations are coupled with individual feedback to maximise the teaching proficiency of the faculty.

A programme was designed and commenced in the second half of 2017, wherein twelve staff members were enrolled in a master degree delivered at the Tshwane campus by the University of the Witwatersrand. The research component of this programme will start during the second half of 2018. This programme allows the participating academics to not only gain in knowledge, but also to upgrade their qualifications.

Resources

Exemplary instruction is supported and enhanced by the employment of purposeful and appropriate resources. Instructional venues are constructed in a variety of sizes and layouts to serve different purposes. Direct teaching techniques require a traditional layout of rows of desks where every seat has an unimpeded view of the presentation area, where whiteboards or projection screens may be used. When students are required to collaborate in syndicates, layouts that enable group members to face each other are more appropriate. Deaf students are taught most effectively in smaller venues with a U-shaped layout, enabling each student to see the interpreter and all the other students in order to communicate via sign language.

Exploiting technology

Information and communication technology (ICT) is not only the focus of Belgium Campus's academic programmes, but also serves as a vital tool in learning and teaching.

The internet has transformed the world over the past two decades and has become the source of the greatest library of information and knowledge in the history of mankind. High-speed access to this information highway has become a way of life, as evidenced by the neologism *google* entering the lexicon as a verb for finding information. Belgium Campus makes this resource available everywhere on its campuses, on all computers, which are all networked together and wirelessly so that it may be accessed from any device an academic, student or any other person chooses to employ for this purpose.

Beyond providing access to information, the internet connects the entire world with each other. Distance and time difference are immaterial, as any parties around the world may communicate in real-time whenever they desire or need to. This has opened up new ways of collaborating, teaching and learning. All Belgium Campus campuses have teaching locations that are equipped with the necessary audio-visual infrastructure to enable virtual distributed venues. This enables teaching and learning events that span not only our campuses, but also includes those of our international academic partners. For example, classes including students from Belgium Campus, PennState and KULeuven are conducted regularly with students attending at their home universities and lecturers rotating between these institutions.

Students collaborate on projects from across the globe, exploiting the vast array of channels enabled by social media to communicate and collaborate as if they were collocated. This brings the benefits of learning to engineer solutions across cultures and awareness of the greater world as they learn to coordinate their activities cognisant of the exigencies of global time zones.

Learning materials

The ITC world grows and changes constantly at a great pace. By the time a textbook is published on an emerging topic, it is often already out of date. This, combined with the fact that Belgium Campus adopts an integrated approach to teaching ITC that applies to the real world, presents special challenges. There may either not be an appropriate textbook available, or it may be necessary to use multiple sources where only selected parts of each is used, written in isolation and lacking the necessary integration of content found in the individual volumes. Belgium Campus adopted the strategy of creating learning materials in-house.

This enables the creation of purpose-fit material that aligns closely with curricula and lesson plans. Valuable real-world case studies, examples and problems may be included at appropriate locations within the text. Theory is integrated with suitable exercises to reinforce the application of the theoretical underpinnings, since after all, "*what we have to learn to do, we learn by doing*[i] ". New technologies are included to replace obsolete ones to ensure that the content is congruent with contemporary industry requirements. Textbooks are revised regularly to ensure that they remain current and add value to the teaching and learning process, and are manufactured on demand throughout the year as modules are scheduled for delivery.

Student support

As per our core value of being a student-centred institution of learning, Belgium Campus realises the importance of looking after the academic, emotional, social and motivational needs and well-being of each individual student.

Mentorship and tutoring

The responsibility to act as mentor is formally part of the curriculum of each academic programme, as students are taught the elements of leadership and that it is essential to care for each other in the spirit of *6363ete63*.

A tutor requires advanced knowledge in the area being taught and moderate teaching ability to convey this to tutees. A mentor needs personal responsibility and investment in the success of mentees, the ability to impart strategic advice and the commitment to guide over an extended period of time. Requiring students to fulfil these roles prepares them to function as valuable and valued members of the organisations they join upon graduation and society in general.

Counselling

A dedicated counselling department serves the needs of the students and staff of Belgium Campus. The department is led by a professional educational psychologist, supported by a team of counsellors educated as social workers. This department collaborates closely with the faculty to identify, assist and resolve academic, social, motivational or psychological impediments to students' success.

Special needs

The Belgium Campus constantly adapts to create an inclusive environment wherein all students may achieve success, regardless of special needs or disability.

Physical access to venues and resources is constructed to enable mobility-impaired students to use these, through ramps, elevators or stair-lifts where necessary and as indicated by the physical layout of individual campuses. Projects are launched to acquire wheelchairs for disadvantaged students in need of these.

Visually-impaired students are assisted with printed materials using larger typefaces, white-on-black printing, and supply of electronic versions of material and audio recordings to supplement printed tests and examinations.

Hearing-impaired students are assisted mainly through awareness, as lecturers are sensitised to face these students directly whenever possible to assist their reception of the spoken communication. For Deaf students (the capitalisation of the term indicating this community's choice of differentiating profound deafness from partial deafness), additional measures are required. It is vital to understand that these individuals suffer from a linguistic disability, since they are unable to perceive spoken language. Their home language is South African Sign Language (SASL), which is unrelated to any of the spoken languages, has its own grammar, syntax and lexicon, and written languages are therefore always foreign languages to them.

Belgium Campus employs a team of SASL interpreters and constructed venues optimal for the instruction of Deaf students. Written material is edited for comprehension, since these students do not possess the range of synonyms, idioms and nuances that hearing individuals take for granted when reading texts. Tests and examinations are supplemented by videos in which the text is signed by an interpreter. It has also been necessary to create new signs for the abundance of technical terms used in ICT and these are documented in a video library. It is necessary to use video, rather than photographs, since articulation involves five factors, one of them being movement of the hands.

All students and staff are given the opportunity to learn basic SASL to enable communication and integrate Deaf students into the Belgium Campus community. Deaf and hearing students integrate naturally and enthusiastically into a single

student body, innovating ways to communicate and participating in their social groups without prompting.

In order to facilitate Deaf students' transition in higher education, an adjusted curriculum was created to deliver their programme over an additional academic year, spreading the cognitive load demands and facilitating an acclimatisation period before these students are fully integrated with their hearing counterparts during the latter parts of the programme.

Various other measures are taken on the advice of the counselling department. Students that suffer from attention deficit disorders often benefit when their material is printed on various coloured pages. In extreme cases, amanuensis is provided to assist students to sit tests and examinations. An amanuensis centre was constructed to cater for individual needs of different students.

Belgium Campus will continue to pursue solutions where required to ensure that every student receives the optimal opportunity to pursue their studies and achieve success, regardless of differently able from their more fortunate mainstream peers.

Guiding principles

As a student-centred learning institution, Belgium Campus is committed to delivering exemplary instruction that maximises each individual student's opportunity to achieve success. This core value is exemplified by the faculty's mantra that reminds us of our goals and the mindset necessary to achieve them. Its simplicity may conceal some of the deep truths it contains that become apparent upon consideration.

No hubris.

Save everybody.

Have fun.

TEACHING MANTRA

The warning against hubris reminds us never to become complacent. Regardless how well something was achieved before, it may always be improved upon and we should always strive to do so. This reminds us to continuously seek to renew, innovate and improve everything that we do. We should be proud without being prideful.

The desire to ensure the success of every student means that we will not consider any individual to be a lost case, but shall use every resource available and expend any necessary effort in the endeavour to guide each student to achieve success. No one is left behind. In this, our idealism trumps pragmatism.

Having fun indicates that we enjoy what we are doing. We are motivated and dedicated to teaching because that is what we want to do. You cannot perform an activity well if you are not committed and we commit to the things we like doing. Teaching itself, and its results in transforming young lives, are sources of satisfaction and bring joy to teacher and student alike.

Primary challenge

As stated at the beginning of this chapter, exemplary teaching is arguably the single factor through which Belgium Campus iTversity may effect the biggest impact. This requires a faculty with several essential characteristics and such individuals are scarce. The primary challenge to maintaining great standards of teaching is to find, attract and retain individuals with the necessary qualifications, knowledge and experience in putting that body of knowledge to effective use in real-world environments. But this alone is not enough. These individuals must also be able to effectively transfer that knowledge to students and be highly motivated to do so. The faculty engages in continuous efforts to find valuable new members, while cultivating and enhancing the abilities of current faculty members and exhorting excellence in all endeavours.

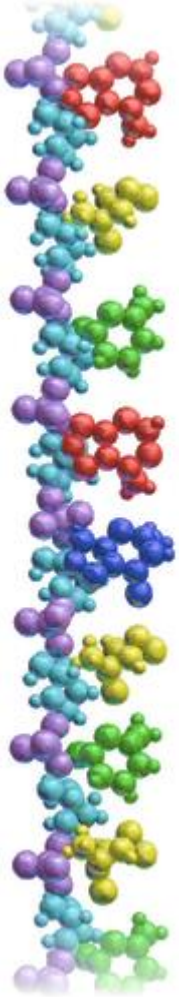
References

Teaching and learning strategy	 An overview of the strategy is presented in CHAPTER 13 • TEACHING AND LEARNING STRATEGY on page 129.
	 Additional information on this strategy and its implementation is available for inspection.
Instructional event management	 A set of artefacts used in the actual delivery of a module is attached in the file MODULE DELIVERY.ZIP.
	 Artefacts used for other modules are available for inspection.
Teaching resources	 Venues and resources necessarily need to be visited to inspect their suitability and exploitation of technology where appropriate to provide effective learning environments, including provision for special needs students.
	 A sample textbook is included in the attachment SAMPLE TEXTBOOK.ZIP.
	 Other textbooks and learning materials are available for inspection, including those adapted for special needs students.
	 The video library of SASL signs for the articulation of ICT terminology may be inspected onsite.
Counselling	 Reports on counselling activities and effectiveness are available for inspection with due consideration for confidentiality.
Academic staff development	 Reports on induction and training activities are available, including the master degree programme for lecturers.

	Curricula vitae and qualifications of academic staff are available for inspection.
	Information on staff that are certified and registered as assessors and/or moderators is available for inspection.
	Student feedback and class observation results are available on lecturers' teaching performance.

[i] Aristotle (2004). THE NICHOMACHEAN ETHICS. London: Penguin.

Chapter 7 Conclusion



It should be acknowledged that the titles of the preceding four chapters, wherein Belgium Campus was discussed thematically from four different perspectives, were chosen so that their initials correspond to those of the bases that define the genetic information in DNA, C, G, A and T. These components CHARACTER, GOVERNANCE, ACADEMIA, and TEACHING, represent the constituents that produce the unique entity Belgium Campus iTversity.

This choice of symbolism serendipitously yields additional meaningful insights without straining the metaphor.

- C and T bases belong to the same class of molecules that have a pleasing symmetric structure. Our character and our teaching represent the more conceptual, idealistic aspects of our nature. G and A bases belong to a different class of molecules, one that adds elaboration to the afore-mentioned symmetric structure. Our governance and academic components represent the more concrete, pragmatic aspects of the institution.
- Bases bind to each other in DNA in specific pairs, each pair consisting of one molecule from each of the conceptual and concrete classes mentioned above and illustrating the necessity of always relating these qualitatively different artefacts to each other in order to generate meaning and validate existence.

  C and G bases bind to form the first such pair. Definitions of our character must find reification in the way we govern; else they remain unfulfilled and empty statements. Our governance activities must originate from how we envisage the character of the institution; otherwise they are at best superfluous, at worst misguided.

  A and T bases bind to form the other possible pair. We need an academic arsenal to be able to teach. This also defines our focus and determines where we ought to expend our energy and resources in what is being taught. On the other hand, our store of academic components should be taught and applied in order to create value; otherwise they are sterile and merely used to impress noncognoscenti as pretty ornaments. Teaching, application and exploitation are the fires that breathe life into academic artefacts.

  The relative strengths of the bindings of CG and AT base pairs occur in a ratio of 3:2. This is indicative of the more rigid relationship required between the

stated character of the institution and how it is governed to achieve these ideals. A more flexible relationship exists between the academic focus and artefacts and the teaching of these to our students. Content may be taught in many different ways and different areas may usefully be combined in novel ways to create insight.

- DNA is used to make RNA, which in turn is used to create proteins. We conceptualise and formulate a mission and strategies, then create action plans and implement them, in order to fulfil our mission of producing highly-valued graduates.

  During the creation of RNA, the **T** base is unique in that it transforms into a closely-related, but different molecule of the same class. All educators are aware that there is always a difference between the logos and the praxis of teaching; awareness and anticipation of this fact makes us better teachers. We further argue the importance thereof that we should always seek to innovate the way we teach in our quest to deliver exemplary instruction.

The DNA analogy has proven useful to describe the constituents and principles of Belgium Campus through evocative symbols.

Alan Turing, whose pioneering work in the field of computing is evident in the fact that any programmable computer is an implementation of a universal Turing machine, also contributed important ideas to the emergence of a living organism from a single, undifferentiated cell[i]. Douglas Hofstadter, important contributor to what may be achievable through computing and proponent of the use of analogy used this to great effect to compare computation in formal systems to that in human DNA to encode amino acids for protein construction[ii]. Roger Penrose demonstrated the limits to computing and seeks to overcome these by investigating the computing possibilities of microtubules in living neurons[iii]. We hope that the simple analogies employed here serve to pay tribute to these great thinkers and their vast influence on our discipline.

In conclusion, we now turn our attention to a brief consideration of the components, ideas and threads presented in this document and attempt to weave these together into a description of the institution. It is hoped that this will provide a lucid picture of this institution of which we are proud and highlight those characteristics that distinguish it from its peers.

Belgium Campus iTversity

The mission of The Belgium Campus is to supply the industry with highly qualified and experienced Information Technology personnel through the provision of high quality, practice-oriented education and training of international standard. The achievement of the mission may be attributed to the multiple factors, a few of which are

highlighted here. The golden threads in these discussions are the constant striving for excellence and the student's invariant position at the centre of concern and the target of all endeavours.

Educational strategy

The qualifications of this institution are unique in the sense that the curriculum is compiled in cooperation with members of industry and academic institutions in South Africa as well as Europe. The exit-level outcomes are determined according to world-wide industry needs and academic standards.

Each module is constructed to provide deep insight into the theoretical foundation of the subject. The theory is then applied to the latest software products, but the knowledge gained is product-agnostic and can be applied to different implementations of the theoretical framework. The aim is always to engender logical thinking and creative problem-solving in the student.

Technical education is always integrated with the development of the interpersonal and other soft skills that are essential to the profile of a successful professional. Courses are designed to teach writing skills, verbal communication and presentation skills as integral components that contribute to the successful completion of each module. Care is taken to develop these skills in students of all different personality types, to maximise each student's opportunities of actualising their potential. Experiential learning is integrated as a major part of learning programmes and is critical in preparing students for placement in the ICT industry when they graduate.

Curriculum planning and development

The Belgium Campus has a policy of aligning the curriculum with the requirements of the industry. The contents of all subjects are continuously revised to ensure that the material taught will enable students to immediately be productive and effective in their professions. New material is introduced to cover new trends, while obsolete material is retired as appropriate.

To this end, Belgium Campus consults with representatives from major enterprises to discover their needs and future plans. Campus management participates in diverse forums and feeds identified focus areas directly back to the faculty, for assessment, planning and incorporation into curricula. Textbooks and educational aids are developed and maintained in-house, which allows rapid reaction to industry needs and delivery of custom education. Regular meetings are held with industry professionals to benchmark curricula and exit level outcomes.

All input from the diverse sources consulted is compiled, categorised and evaluated. Trends and common threads are identified. Care is taken to interpret all needs accurately, eliminating the divergence of different vocabularies and predicting the actual future requirements of the industry. Extensive consultation is engaged in to refine future needs and effectively plan for the implementation of new curriculum

components that will satisfy these demands. Existing offerings are constantly revisited to ensure that they remain current and applicable in the modern workplace.

Experiential learning through workplace-based internship ensures that students have already applied their learning in a professional environment by the time they graduate.

Optimising the adaptation to higher education

The process of adjusting from a high school environment to university is often challenging to freshman students. Students are expected to exercise responsibility, self-discipline and maturity in a higher education milieu. They usually experience a large increase in the volume of information they must assimilate and the knowledge that must be reproduced and applied during examinations. It is no longer sufficient to repeat facts, but required to organise these into coherent arguments that demonstrate a thorough understanding of the subject matter.

Students are provided with clear objectives and a schedule of deliverables at the start of each module. Each module is assessed on class tests, assignments and larger projects for more advanced subjects. The requirement of submitting deliverables regularly results in students rapidly learning to avoid procrastination. The continuous evaluation of all submitted work enables the academic staff to identify problem areas for students early, so that corrective action can be taken before a serious problem manifests.

Assessment, guidance and counselling

The Belgium Campus provides free counselling by a professional educational psychologist, with a supporting team of social workers, to any student in need of support. Counselling ranges from academic issues such as study techniques, time planning and preparation for examinations, to any personal problems that a student may experience.

Individual students experience diverse challenges: from attention deficit disorder, hyperactivity and dyslexia to health problems that affect their performance such as diabetes, depression and bipolar disorder. Each case is handled on an individual basis, with actions that may include:

- Regular counselling sessions with the student, supplemented with meetings with parents when appropriate so that the student may be assisted by all related parties. Physicians are consulted to ensure that a student's entire case history is taken into account.
- Additional classes are presented to small groups of students or on an individual basis. There is no limit on the time or effort invested in helping students who are experiencing difficulties with a subject.
- Extra time is granted to individual students with specific disabilities when sitting examinations. Written examinations may be supplemented with oral

examinations if indicated by the needs of the student. These decisions are always made in consultation with the student counsellor, who is qualified to advise on the appropriate assistance to render to students with special needs.

Students are formally assessed at least once a week. All results are analysed continuously by the faculty. This allows early identification of potential deterioration in performance. Students are counselled as soon as anomalies become apparent to determine the cause of the problem and corrective action planned in cooperation with the student. The academic faculty is also trained on warning signs to look out for and report danger signs for investigation and remedial action.

Individual progress is assessed continuously. Standard assessment includes testing a student's demonstration of thorough understanding of the theoretical principles of a subject, technical skill with the tools of the subject, and evaluation and feedback regarding the standards expected by the industry. Students are required to demonstrate proficiency in writing, presentation and all forms of communication. Technical skills are developed in scenarios that simulate real, work-based projects in order to ensure that the education delivered is not divorced from reality, but preparation for the roles that the students will fulfil as ICT professionals after graduating.

The results of all assessments and counselling are integrated into individual progress reports that provide holistic views of students. These reports identify areas where students need to be developed in order to become compleat ICT professionals. Weekly staff meetings are conducted where feedback is received from and provided to staff. Insights are shared and students that require attention are identified and action plans for each student are brought into focus. Feedback is also provided to students themselves and to the industry. Care is taken to ensure that all feedback received is properly evaluated and inserted back into the appropriate processes. All actions must always add value, serve a well-defined purpose and trigger further actions whenever necessary.

International and real-world exposure

Belgium Campus students cooperate with peers from around the globe in multicultural, multidisciplinary teams to construct products that impact on real-world problems. They employ technical knowledge and experience earned through constant practice with creativity to deliver innovative solutions. The students adapt to a globally-connected world by working effectively in teams where they often do not meet their colleagues face-to-face, but function in virtual environments as if they were neighbours.

The close collaboration with business partners to determine their needs during curriculum development leads not only to the use of frameworks and products that graduates are likely to encounter in the workplace, but also to practical exercises and

projects that resemble the tasks they will be expected to perform. In-service training as integral parts of academic programmes prepare students to meet the demands of working environments – delivering on time, meeting expectations, adapting to changing requirements, valuing completed staff work up to crossing the final *t* and dotting the last *I*, synthesising high-quality output, reporting accurately, communicating effectively, accepting responsibility, assuming accountability and taking pride their work. Upon graduation, they are off to a running start and can work as if they had been with their employers for years.

These factors combine and contribute towards an output of graduates who are sought after by employers. They add value to their employers and flourish in challenging environments, resulting in career longevity. For these reasons Belgium Campus iTversity may claim that it is achieving its mission. This, of course, ensures the welfare of these individuals and empowers them to change their environment and circumstances. They also impact positively on their environments and communities, attributable to the values of caring and good citizenship that are instilled by Belgium Campus. Therefore, the institution can also claim that it is realising its vision of contributing to the positive transformation of South Africa.

Forward... an afterword by the CEO

Since it was founded, BC iTversity has gone through a great number of changes. The institution has evolved. In doing so we have managed to keep all the good things developed in the earlier stages of our existence, because our core value has remained the same, namely to produce graduates with relevant knowledge and skills who are immediately employable. Holding on to that cornerstone concept, time and time again we have augmented our existing systems, brought them up to date and as an institution for higher teaching and learning we have developed as an organisation as well by setting new goalposts, raising the bar and taking on board more tasks and responsibilities.

We regard our existence as a very specific continuum, something we make visible in our approach to education and training as a concept. Education is a continuum, constantly building upon what exists, constantly looking for new academic and professional challenges. Education is also a continuum, in the sense that it is linked on the *in* and the *out* of the teaching and learning processes, linking industry, the academic world and our people and their communities. That is also where we look for our stakeholder groups.

At the time BC iTversity was established, it was conceived as a training centre with the aim of educating and training promising young people and turning them into good professionals, with a specific added value obtained through exposure to the Belgium Campus experience. We delivered as promised, but both our own ambitions and the

interaction with our stakeholders soon made us evolve into what we are today and what we aspire to become tomorrow.

When we set out we brought with us a global mindset, and increasingly we learned to appreciate the requirements and needs of the stakeholders working for regional development. The South African context specifically taught us the importance of offering support to the community and its people. We started to look at our mandate differently and we had to bring in different perspectives. It was very important that we were to operate in and promote a *glocal* approach. This was done by setting up a kind of consultation platform to enable the meeting of minds. The dialogue that ensued showed us that there is a great need for us to be instrumental in the place making and place management of country, region and city. We do that by empowering people and communities, through education and training, and so enabling them to become professionals with an added value. We have now also arrived at the point where we realise that even more is expected of us and that we need to assist communities or cities by doing specific applied and other research and developing efficient and effective solutions and tools for specific challenges. In other words, we need to become more science-based than we used to be.

These insights have caused us to develop three pillars that support our education and training, our R&D and our community engagement. First there is the student-centred approach, second there is the Participative Development Model, which basically is our methodology that enables us to place the student central, and thirdly there is the Learning Factory, the toolset we use.

This is shored up by strict quality standards, offering relevant content, and innovative forms of delivery of the curriculum. The combination of the three pillars has created a very specific educational ecology, the backdrop for a specific student experience. It is what sets our alumni apart.

The student is central to everything. We find ourselves lucky in the fact that we are able to reach out to prospective candidates who are possibly excellent ICT student material. Our outreach operations and drives target promising and motivated students, and even if they are not fully ready yet we will guide them to bring them to the point where they can decide to join. A specific academic environment is therefore constructed round the students, challenging them to excel and become the best version of themselves. This may sound a bit like a marketing slogan, but time and again this fact is attested by our alumni. We believe in developing competence in the form of knowledge and skills, but we also invest heavily in forming and forging character and attitude, and aim for creating a growth mindset. We want the graduates to possess metacognitive skills, such as reflection, so that they will be able to embark on their lifelong learning journey. We want them to be innovative and show initiative and leadership. Another aspect that sets BC iTversity apart is our constant effort to reach out to students hailing from special interest groups, such as

underprivileged black girls, disabled youngsters, who otherwise will not get the possibility to study, and the deaf students. This again shows our commitment to empowerment and community engagement, which is so important in this country.

The second pillar consists of our Participative Development Model. In essence this is a continuous dialogue with the employers on the one hand, and leading industrial developers, such as Microsoft, or IBM, Infor, Cisco, etc. on the other. This creates a sizeable group of actors we talk to and consult with. Currently there are about 70 different employers we are constantly speaking to, which shows us where the trends on the market are leading to and what is needed to offer relevant education. The university alliances with the industrial developers help us to keep abreast with the latest technologies, and how they are being used in industry today, and will be tomorrow. These various sets of unique dialogues add an immediate and tangible value to our development processes, constitute an incessant benchmark, and are the foundation upon which our curriculum is developed. Indeed, the one concept we keep looking for is relevance of the curriculum, to ensure employability and quality.

In the course of the years industry and science have evolved rapidly, especially science. The fourth industrial revolution is speeding up, and the ongoing dialogue with the stakeholders and employers which discusses the consequences of that revolution made it clear that a paradigm shift was in order for higher education as well, it also called for different types of graduates. In the past we could rely on existing materials, basically based on the commercial products used by industry. There was a need for translation of the business processes into information systems. Connectivity became a significant issue, making things perceptible and creating visibility and awareness by means of internet applications, mobile apps. Today, the collection and mining of big data, and working in a multidisciplinary environment have become essential to creating modern solutions. Metrics and having immediate access to metrics are key; dashboards and cockpits developed for directly visible (automated) business intelligence, and decision making.

We must come to the conclusion that working on the basis of the use of industrial products is no longer sufficient; a more research-based approach has become indispensable. In other words, we feel that the challenges and solutions offered by the fourth industrial revolution have upped the ante quite a lot for us. End users are more and more requiring scientific made-to-measure solutions. So there is no other option but to change tack and augment our performance in science-based education and development. Again, to us it is obvious that we should keep our basic principles and values, methods and tools, because they are good and have proven their worth, but we have to expand our activities and systems and make much more use of science-based approaches, first applied science especially, but we also have to link up with fundamental research to be aware of what is happening.

In the past we evolved from a training centre to a polytechnic institution of higher education; now the time has arrived for us to take yet another leap forward and become a university, in the sense that we are offering research-based education together with profession-based education and training. The idea is that looking at the mission of a university we talk about creating knowledge, transferring knowledge and offering services to the community. For us it is important how this comes together. How to use new knowledge, translate this in a curriculum defined as the total of activities in the learning environment, and create innovative solutions that add value to the community/society. It is not enough to work from a 'gut-feeling', we now need to start using and translating more scientific research and develop tangible solutions.

In order to do that we established our own research and development institution, Botlhale Village, our own innovation hub. This was done together with the third systemic pillar, the Learning Factory, which we have developed in cooperation with KULeuven (Belgium) and Penn State University (USA). The system is key in our transition from offering education based on industrial knowledge and skills to education based on academic science-based knowledge and skills. The obvious route now is to develop our master programmes.

The learning factories represent a vital enrichment of the total student experience. These are the sites for a meeting of minds between students, academics, the industry and the community in a multidisciplinary milieu, where innovation is cultivated and the solutions for tomorrow's world are born.

Our growth and development is testimony to our institutional success, and the success of our alumni. This has led to more students, but also to more regions where we want to have a presence. The specific regional identity of the different locations dictates specific needs. This means we have to diversify, and we have to invest in the development of a multi-campus model. This is a real challenge, because we aim for unity in diversity, all the while making sure that quality and standards are maintained everywhere. Again we are looking for new educational methods to deliver an integrated and integrating curriculum. Relevance, sustainability and capacity building are serious challenges.

As was said earlier, we regard our educational model as a continuum, within the educational paradigm, and as an expression of our relations with all the stakeholders. When they change, we change, though without abandoning what was good. We never forget our roots and how they were given shape; we remain true to our values and vision and keep building on the sound foundations that were laid in the past.

Enrico M. Jacobs
Chief executive officer
Pretoria
7th September 2018

[i] Turing, A.M. (1952). "The Chemical Basis of Morphogenesis". PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY OF LONDON, B 237(641): 37–72.
[ii] Hofstadter, D.R. (1979). GÖDEL, ESCHER, BACH: AN ETERNAL GOLDEN BRAID. New York: Basic Books.
[iii] Penrose, R. (1994). SHADOWS OF THE MIND: A SEARCH FOR THE MISSING SCIENCE OF CONSCIOUSNESS. Oxford: Oxford University Press.

Appendix A Administrative information

Legal information

Belgium Campus iTversity is a registered non-profit company.

Company information

Juristic entity	**Belgium Campus iTversity 1 NPC**
Company registration no.	2001/017971/08
Domicilium citandi et executandi	138 Berg Avenue Heatherdale AH Pretoria South Africa
PBO reference no.	930009313
B-BBEE certificate	Level 4 contributor 01/B-BBEE/2017/00225/GEN

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Campuses

Tshwane (main)	**Ekurhuleni**	**Nelson Mandela Bay**
1257 Berg Avenue Heatherdale Pretoria Gauteng	45A Long Street Kempton Park Gauteng	6 Uitenhage Road North End Port Elizabeth Eastern Cape
[−25.683115, 28.131177]	[−26.106031, 28.238295]	[−33.934627, 25.6013303]
+27 (0)12 542 3114	+27 (0)12 542 3114	+27 (0)41 484 5537

Regulatory information

Registration as PHEI

DHET registration no. 2003/HE08/001

Qualifications

	CESM	HEQC	SAQA
Bachelor of Computing	06	H/PR059/E002	62689
Bachelor of Information Technology	06	H/PR059/E003	94121
Diploma in Information Technology	06	H/PR059/K001	62621

CESM category 06 is defined as COMPUTER AND INFORMATION SCIENCES.

Appendix B Glossary

Acronyms and abbreviations

ABET	Adult Basic Education and Training
AET	Adult Education and Training
AQP	Assessment quality partner
B-BEEE	Broad-based black economic empowerment
CAT	Credit accumulation and transfer
CCFO	Critical cross-field outcome
CESM	Classification of Educational Subject Matter
CETC	Community education and training college
CHE	Council on Higher Education
CLC	Community learning centre
DBE	Department of Basic Education
DHET	Department of Higher Education and Training
DoE	Department of Education
DPSA	Department of Public Service and Administration
DQP	Development quality partner
DST	Department of Science and Technology
DTI	Department of Trade and Industry
FET	Further education and training
GET	General education and training
GFETQSF	General and Further Education and Training Qualifications Sub-Framework
HEI	Higher education institution
HEQC	Higher Education Quality Committee
HEQSF	Higher Education Qualifications Sub-Framework
ICT	Information and communications technology
NADSC	National Artisan Development Support Centre
NAMB	National Artisan Moderation Body
NLRD	National Learners' Records Database
NPC	National Planning Commission

NQF	National Qualifications Framework
NSF	National Skills Fund
NSFAS	National Student Financial Aid Scheme
OQSF	Occupational Qualifications Sub-Framework
PBO	Public benefit organisation
PHEI	Private higher education institution
PSET	Post-school education and training
QC	Quality council
QCTO	Quality Council for Trades and Occupations
RPL	Recognition of prior learning
SAQA	South African Qualifications Authority
SETA	Sector Education and Training Authority
STEM	Science, technology, engineering, and mathematics
TVET	Technical and vocational education and training
Umalusi	Quality Council for General and Further Education and Training
UoT	University of Technology
WIL	Work-integrated learning

Definitions

Where terms may be interpreted differently in the three different education sectors, the interpretation used in the Higher Education sector is favoured.

Access	opportunity to pursue education and training by gaining entry to higher education
accreditation	the principles and processes whereby programmes leading to qualifications registered on the NQF are evaluated by a quality assurance body to recognise a legally established institution as having the capacity to offer a qualification or part-qualification at the required standard; and/or to approve a learning programme as meeting the required standard
accredited learning programme	a learning programme leading to one of the qualification types of a sub-framework of the NQF that has gone through the process of approval by the relevant quality council
admissions procedures	the application of institution-specific selection criteria to select potential learners to pursue education and training opportunities in programmes offered by an institution
advanced standing	the status granted to a learner for admission to studies at a higher level than their prior formal studies would have

	allowed, including exemption where applicable
applied competence	the ability to put into practice in the relevant context, the learning outcomes acquired in the process of obtaining a qualification or part-qualification, encapsulating foundational, reflexive and practical competence
articulation	the process of forming possibilities of connection between qualifications and/or part-qualifications to allow for the vertical, lateral and diagonal movement of learners through the formal education and training system and its linkages with the world of work
artisan	a person certified as competent to undertake a listed trade in accordance with the relevant legislation
basic education	education and training that takes place in primary and secondary schools, as well as in adult education and training centres
continuing education and training	various forms of education provided for adults consisting both of qualifications and part-qualifications, as well as short or part-time courses
credit	a measure of the volume of learning required for a qualification or part-qualification, quantified as the number of notional study hours required for achieving the learning outcomes for the qualification or part-qualification, with one credit equated to ten notional hours of learning
credit accumulation	the totalling of credits towards the completion of a qualification or part-qualification, notably the recognition of modules and courses
credit accumulation and transfer	an arrangement whereby the diverse features of both credit accumulation and credit transfer are combined to facilitate lifelong learning and access to the workplace
credit transfer	the vertical, horizontal or diagonal relocation of credits towards a qualification or part-qualification registered on the same or different sub-framework, notably the recognition of part-qualifications from another institution or from another faculty or discipline in the same institution
critical cross-field outcomes	the generic outcomes which inform all learning and teaching, also called graduate attributes
higher education	education that normally takes place in public universities and registered private higher education institutions which offer qualifications that meet the requirements of the HEQSF
recognition of prior learning	the principles and processes through which the prior knowledge and skills of a person are made visible, mediated and assessed for the purposes of alternative access and admission, recognition and certification, or further learning and development

Appendix C Legislative and regulatory framework

This section lists the essential legislation, policies and guidelines applicable that define the context within which Belgium Campus iTversity operates.

Legislative entities

Constitutional Assembly

CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

Parliament

ADULT BASIC EDUCATION AND TRAINING ACT
Act 52 of 2000

BASIC EDUCATION LAWS AMENDMENT ACT
Act 15 of 2011

BROAD-BASED BLACK ECONOMIC EMPOWERMENT ACT
Act 53 of 2003, *as amended by* Act 46 of 2013

EDUCATION LAWS AMENDMENT ACTS
Act 100 of 1997, Act 48 of 1999, Act 53 of 2000, Act 57 of 2001, Act 50 of 2002, Act 1 of 2004, Act 24 of 2005, Act 31 of 2007

EMPLOYMENT OF EDUCATORS ACT
Act 76 of 1998

EMPLOYMENT TAX INCENTIVE ACT
Act 26 of 2013

FURTHER EDUCATION AND TRAINING ACT
Act 98 of 1998

FURTHER EDUCATION AND TRAINING COLLEGES ACT
Act 16 of 2006, *as amended by* Act 3 of 2012, Act 1 of 2013

GENERAL AND FURTHER EDUCATION AND TRAINING QUALITY ASSURANCE ACT
Act 58 of 2001, *as amended by* Act 50 of 2008

HIGHER EDUCATION ACT
Act 101 of 1997, *as amended by* Act 55 of 1999, Act 54 of 2000, Act 23 of 2001, Act 63 of 2002, Act 38 of 2003, Act 39 of 2008, Act 9 of 2016

HIGHER EDUCATION AND TRAINING LAWS AMENDMENT ACTS
Act 25 of 2010, Act 23 of 2012

HIGHER EDUCATION LAWS AMENDMENT ACTS
Act 26 of 2010, Act 21 of 2011

HUMAN SCIENCES RESEARCH COUNCIL ACT
Act 17 of 2008

- **NATIONAL EDUCATION POLICY ACT**
  Act 27 of 1996
- **NATIONAL QUALIFICATIONS FRAMEWORK ACT**
  Act 67 of 2008
- **NATIONAL RESEARCH FOUNDATION ACT**
  Act 23 of 1998
- **NATIONAL STUDENT FINANCIAL AID SCHEME ACT**
  Act 56 of 1999
- **NATIONAL YOUTH DEVELOPMENT AGENCY ACT**
  Act 54 of 2008
- **PROMOTION OF EQUALITY AND PREVENTION OF UNFAIR DISCRIMINATION ACT**
  Act 4 of 2000, *as amended by* Act 52 of 2002
- **PROTECTION OF PERSONAL INFORMATION ACT**
  Act 4 of 2013
- **SCIENCE AND TECHNOLOGY LAWS AMENDMENT ACTS**
  Act 16 of 2011, Act 7 of 2014
- **SKILLS DEVELOPMENT ACT**
  Act 97 of 1998, *as amended by* Act 31 of 2003, Act 37 of 2008
- **SKILLS DEVELOPMENT LEVIES ACT**
  Act 9 of 1999, *as amended by* Act 23 of 2010
- **SOUTH AFRICAN COUNCIL FOR EDUCATORS ACT**
  Act 31 of 2000
- **SOUTH AFRICAN QUALIFICATIONS AUTHORITY ACT**
  Act 58 of 1995
- **SOUTH AFRICAN SCHOOLS ACT**
  Act 84 of 1996
- **TECHNOLOGY INNOVATION AGENCY ACT**
  Act 26 of 2008
- **USE OF OFFICIAL LANGUAGES ACT**
  Act 12 of 2012

Executive entities

National Planning Commission

national planning commission
Department of Planning, Monitoring and Evaluation
REPUBLIC OF SOUTH AFRICA

NATIONAL DEVELOPMENT PLAN 2030: OUR FUTURE – MAKE IT WORK (August 2012)

Department of Higher Education and Training

education
Department of Education
REPUBLIC OF SOUTH AFRICA

CLASSIFICATION OF EDUCATIONAL SUBJECT MATTER (August 2008)

GREEN PAPER FOR POST-SCHOOL EDUCATION AND TRAINING (January 2012)

WHITE PAPER FOR POST-SCHOOL EDUCATION AND TRAINING: BUILDING AN EXPANDED, EFFECTIVE AND INTEGRATED POST-SCHOOL SYSTEM. (November 2013)

Statutory entities

South African Qualifications Authority

LEVEL DESCRIPTORS FOR THE SOUTH AFRICAN NATIONAL QUALIFICATIONS FRAMEWORK (November 2012}

NATIONAL POLICY FOR THE IMPLEMENTATION OF THE RECOGNITION OF PRIOR LEARNING (March 2013)

PATHWAY TRENDS: QUALIFICATIONS AWARDED AND LEARNERS' MOVEMENT ACROSS THE SOUTH AFRICAN EDUCATION AND TRAINING SYSTEM, 1994 TO 2014 (March 2017)

POLICY AND CRITERIA FOR RECOGNISING A PROFESSIONAL BODY AND REGISTERING A PROFESSIONAL DESIGNATION FOR THE PURPOSES OF THE NATIONAL QUALIFICATIONS FRAMEWORK (November 2012)

POLICY AND CRITERIA FOR THE REGISTRATION OF QUALIFICATIONS AND PART QUALIFICATIONS ON THE NATIONAL QUALIFICATIONS FRAMEWORK (March 2013)

POLICY FOR CREDIT ACCUMULATION AND TRANSFER WITHIN THE NATIONAL QUALIFICATIONS FRAMEWORK (*to be gazetted*)

STANDARD GLOSSARY OF TERMS: TERMS RELATED TO THE NATIONAL QUALIFICATIONS FRAMEWORK (April 2014, *revised* November 2014, *revised* September 2017)

Council on Higher Education

CRITERIA FOR PROGRAMME ACCREDITATION (September 2004, *revised* June 2012, *awaiting adoption of 2014 criteria as of March 2018*)

DISTANCE HIGHER EDUCATION PROGRAMMES IN A DIGITAL ERA: GOOD PRACTICE GUIDE (2014)

FRAMEWORK FOR INSTITUTIONAL AUDITS (June 2004)

FRAMEWORK FOR INSTITUTIONAL QUALITY ENHANCEMENT IN THE SECOND PERIOD OF QUALITY ASSURANCE (January 2014)

FRAMEWORK FOR THE ACCREDITATION AND RE-ACCREDITATION OF PROGRAMMES (March 2018)

THE HIGHER EDUCATION QUALIFICATIONS SUB-FRAMEWORK (2013)

HIGHER EDUCATION QUALITY COMMITTEE FOUNDING DOCUMENT (August 2000)

POLICIES ON THE RECOGNITION OF PRIOR LEARNING, CREDIT ACCUMULATION AND TRANSFER, AND ASSESSMENT IN HIGHER EDUCATION (August 2016)

Umalusi

POLICY FOR THE GENERAL EDUCATION AND TRAINING CERTIFICATE FOR ADULTS (August 2015)

POLICY FOR THE NATIONAL SENIOR CERTIFICATE FOR ADULTS (August 2014)

Quality Council for Trades and Occupations

POLICY ON DELEGATION OF QUALIFICATION DESIGN AND ASSESSMENT TO DEVELOPMENT QUALITY PARTNERS (DQPS) AND ASSESSMENT QUALITY PARTNERS (AQPS) (June 2011)

Chapter 8 Bachelor of Computing

The Bachelor of Computing is an accredited higher education qualification registered on level 8 of the HEQSF. This level is classified as a postgraduate level containing bachelor honours degrees, professional bachelor degrees and postgraduate diplomas. NQF 8 qualifications grant access to master degree programmes in cognate disciplines.

Objective

This programme is firstly created in line with the institutional mission of producing graduates that possess the competencies that make them valuable to employers. They will also be equipped to launch their own enterprises if they wish and mould these into successful commercial entities. This encompasses thorough mastery of the body of knowledge at both the core and the emerging frontiers of ICT, reified through practice and application in real, complex and challenging situations and diverse scenarios. As is expected from a graduate from an NQF level 8 programme, these graduates will act as leaders, innovators and visionaries. They guide the activities and direction of the enterprises where they work through their keen understanding of ICT, business acumen and ability to integrate different bodies of knowledge to generate novel solutions that give their businesses a competitive edge. These graduates have also completed research and produced dissertations, enabling them to pursue advanced study at master level.

Outcomes

Upon successful completion of this programme, a student will be able to demonstrate:

- Knowledge of and engagement in a specialisation area at the forefront of ICT; an understanding of the theories, research methodologies, methods and techniques relevant to that area; and an understanding of how to apply that knowledge in diverse contexts;
- The ability to interrogate multiple sources of knowledge in an area of specialisation and to evaluate knowledge and processes of knowledge production;
- An understanding of the complexities and uncertainties of selecting, applying or transferring appropriate standard procedures, processes or techniques to unfamiliar problems in a specialised field;
- The ability to analyse, evaluate, critically reflect on and address complex problems, applying evidence-based solutions and theory-driven arguments;

- The ability to identify and address ethical issues based on critical reflection on the suitability of different ethical value systems to specific contexts;
- The ability to critically review information gathering, synthesis of data, evaluation and management processes in specialised contexts in order to develop creative responses to problems and issues;
- The ability to present and communicate academic, professional or occupational ideas and texts effectively to a range of audiences, offering creative insights, rigorous interpretations and solutions to problems and issues appropriate to the context;
- The ability to operate effectively within a system, or manage a system based on an understanding of the roles and relationships between elements within the system;
- The ability of apply, in a self-critical manner, learning strategies which effectively address their professional and ongoing learning needs and those of others; and
- The ability to take full responsibility for their own work, decision-making and use of resources, and full accountability for the decisions and actions of others where appropriate.

Programme

The programme is structured over four years. The first three years, each consisting of 120 credits, represent academic education through contact mode. The fourth year comprises in-service training at a South African or international enterprise to apply the knowledge gained in a real-world environment, also for 120 credits. During this final year, students also conduct academic research which culminates in the production and presentation of a thesis for 30 credits.

The academic programme consists of **core** modules, which are essential and common to all instances of the programme; **fundamental** modules, that define the essence of a specific specialisation stream; and **elective** modules, from which students may select options to customise their specific programme and experience. This strategy enables emerging fields to be introduced as elective subjects to provide students with exposure to these subjects. When such a field solidifies it can then be developed into a full-fledged specialisation stream with its own set of fundamental modules.

Structure

Individual modules in this programme are pitched at NQF 5, 6, 7 and 8, representing the defined learning outcomes of each module. The escalation in NQF level during the programme is indicative of students' progress and increase in cognitive demand as the depth of learning increases over successive academic years.

The credits associated with a module are a measure of the amount of learning required to complete the module successfully. One credit equates to ten notional hours of learning, which indicates the time required for an average student to master the necessary learning. The NQF level and credits thus represent the complexity and size of a module, respectively.

1st Academic year

Module	NQF	Credits
Core modules		
Academic Writing 121	5	4
Computer Architecture 121	5	4
Database Development 121	5	12
Information Systems 121	5	12
Innovation and Leadership 101	5	5
Innovation and Leadership 102	5	5
Linear Programming 121	5	11
Mathematics 121	5	11
Networking Development 121	5	8
Programming 121	5	16
Programming 122	5	9
Statistics 121	5	4
Web Programming 121	5	12
Elective modules (*choose one of*)		
Business Management 121	5	7
Entrepreneurship 121	5	7
		120

2nd Academic year

Module	NQF	Credits
Core modules		
Database Development 221	6	15
Information Systems 221	6	12
Innovation and Leadership 201	6	5
Innovation and Leadership 202	6	5
Linear Programming 221	6	11
Mathematics 221	6	11
Programming 221	6	13
Programming 222	6	8
Project Management 221	6	7
Statistics 221	6	4
Web Programming 221	6	12
Fundamental module (**Software Engineering**)		
Software Analysis and Design 221	7	9
Fundamental module (**Business Intelligence**)		
Data Warehousing 221	7	9
Elective modules (*choose one of*)		
Internet of Things 221	6	8
Software Testing 221	6	8
		120

3rd Academic year

Module	NQF	Credits
Core modules		
Applied Research 321	7	5
Database Development 321	7	8
Innovation and Leadership 321	7	5
Linear Programming 321	7	11
Machine Learning 321	7	8
Project 321	8	17
Project Management 321	7	7
Fundamental modules (**Software Engineering**)		
Programming 321	7	9
Software Engineering 321	8	30
Web Programming 321	7	9
Fundamental modules (**Business Intelligence**)		
Business Intelligence 321	8	30
Database Administration 321	7	9
Statistics 321	7	9
Elective modules (*choose one of*)		
Innovation Management 321	7	11
Machine Learning 322	7	11
User Experience Design 321	7	11
		120

4th Academic year

Module	NQF	Credits
Core modules		
Applied Information Technology 421	7	60
Applied Information Technology 422	8	60
Thesis 421	8	30
		150

Modules

Due to the volume of information, the details regarding the purpose, outcomes, prerequisites, assessment strategy, learning activities, learning materials and syllabus of each module are described in an attached file accompanying this document.

Capstone

The academic part of the programme culminates in a major *Innovation Project*. Successful completion of the project requires demonstration of all the competencies acquired over the course of the programme. This includes, of course, mastery of several bodies of knowledge and integration of these into a coherent cognitive whole in order to apply this knowledge to construct significant, complex products. Beyond this, the projects are executed by multidisciplinary teams, demanding students be not

only individually excellent technicians but also functional in team environments, adept at leading and exhorting their fellows to excellence and achieving their shared goals. The wizard must ensure that the entire fellowship reaches the destination.

Leading up to this project in the last semester of the third year, the *Innovation and Leadership* modules in the preceding five semesters run like a golden thread to prepare students for the capstone module.

Innovation and leadership

These modules are present in all academic programmes for the various qualifications offered by Belgium Campus. All students from the different programmes collaborate jointly in these modules, which span their academic programmes to culminate in each programme's capstone project module.

Rationale

In the modern world, especially so within the sphere of ICT, the creation of new products and systems is a cooperative enterprise. An ICT project requires the contributions and interaction of many and varied specialised teams to achieve its objectives. All these teams need to operate efficiently to deliver their individual products and collaborate with each other in order to achieve the overall objective.

An ICT professional needs to fulfil many roles at different times during the execution of such a project.

- As an *innovator*, the individual must consider the requirements of the stakeholders in their environment and select those they intend to address. The innovator applies their knowledge and skills to synthesise an innovative solution that will provide benefit to the target stakeholders. The results of this ideation process must be concretised in a proposal that is submitted to potential sponsors in a form that convinces the sponsor to adopt the proposal and gain the support and resources required to reify the solution.
- As a *team member*, the individual must execute their responsibilities with due diligence and cognisance of the activities and objectives of other members to pursue the success of the joint effort. Team members must value the diversity of each member to collaborate as a unit and optimise the achievement of each member to ensure the success of the team.
- As a *specialist* or consultant for a specific body of knowledge, the individual must analyse and understand the requirements and objectives of the individual or group soliciting advice. The consultant must exploit their own knowledge and experience to advise on decisions, preferred courses of action and guidelines for achieving optimal results, while issuing clear warnings on any dangers or potential problems identified. Consultants must take responsibility for any input provided, or failed to provide, to their clients.

- As a *team leader*, the individual must coordinate the activities of the team members and ensure that all activities contribute to the achievement of the team's objectives. This includes the motivation of the team as a whole and its individual members to engage in the pursuit of these objectives. Team leaders must ensure the well-being and success of the members and take responsibility for achieving the team's objectives.
- As a (sub-)*project manager*, the individual is responsible for planning, organising, directing and controlling the efforts and output of different teams that are contributing components of the final product or system. Interaction between teams must be coordinated and management actions executed where necessary to ensure the overall project objectives are reached on time and within budget.

Structure

Students at first-, second- and third-year levels collaborate to produce innovative solutions in an entrepreneurial context. Towards this end, each project is managed as an entrepreneurial entity bringing a product to market.

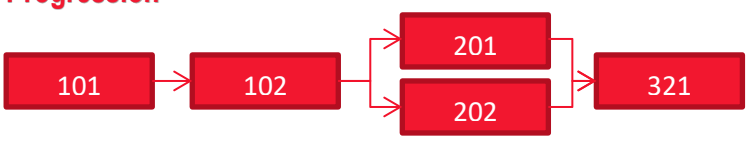
The needs of the various stakeholders in the environment are analysed and a solution is engineered that will address an identified problem experienced by the surrounding community, society or special-needs group. The introduction of novelty into existing systems or organisations is pursued to find innovative ways of addressing these challenges in new, but affordable and achievable, ways. Solutions are built by exploiting information and communication technology.

Students participate in roles in these projects that expand in responsibility as they rise in seniority. The academic outcomes for a role are aligned with the corresponding NQF level descriptors. Each semester, the successful student is promoted to a new role requiring higher levels of responsibility and engagement.

	1st semester	2nd semester
1st year	Innovator	Team member
2nd year	Specialist / consultant	Team leader
	Team leader	Specialist / consultant
3rd year	Project manager	

Conceptualisation and ideation of innovative solutions occur during the first semester. Creation of a product implementing the innovative solution starts mid-year and continues until the middle of the following year.

Progression



Successful completion of this sequence of modules (or part thereof), leads into and serves as prerequisite for the appropriate Innovation Project modules. Students enrolled for the Diploma in Information Technology complete modules 101, 102 and 201 before commencing their innovation project. Student enrolled for the Bachelor of Information Technology or the Bachelor of Computing complete modules 101, 102, 201, 202 and 321 before commencing their innovation project.

Note that the modules 201 and 202 may be completed in either order. This may be exploited to ensure the availability of sufficient students in both roles of the course of the year.

Assessment

Achievement of the exit level outcomes of the academic part of the programmes is demonstrated by the capstone project. This project is assessed by academics and external parties in the role of the projects' customers or sponsors. This module is externally moderated to verify that the exit level outcomes were achieved.

The experiential components of the programme are assessed jointly with the external parties hosting the students' in-service training.

In the supervised research component, students conduct research and produce theses, which they present to a jury for final evaluation. This component is also externally moderated to verify that it delivers the exit level outcomes defined for the research component.

Validity

These various internal and external assessment procedures, combined with the required external moderation, ensure that judgements regarding achievement of exit level outcomes are valid and that it is justified to certify achievement through the award of qualifications.

References

Programme modules	Detailed information on each module may be found in the attached file **Bcomp modules.zip**.
Design process	Refer to CHAPTER 10 • CURRICULUM DESIGN on page 105.
Stakeholders	Refer to CHAPTER 5 • ACADEMIA on page 53.

Chapter 9 Botlhale Village

Belgium Campus iTversity established Botlhale Village to serve as an incubation and innovation village that provides an enabling, supportive and protective environment to incubate and accelerate innovative IT solutions. The envisioned solutions are explicitly not intended to focus purely on technology, but rather to *use* technology in an innovative way across disciplines, meeting stakeholders' requirements across the value chain.

Operational model

The Botlhale Village serves as the platform where education, research and innovation meet through ICT and embark together to yield tangible social impact, through purposeful research projects and enterprises. Botlhale Village's ***Collaborative Innovation Model*** aims to transform fundamental research into applied research into real-life applications – integrating cutting-edge ICT-knowledge and fostering continuous collaboration between key stakeholders, i.e. business, university, government and society. With Botlhale Village linked with local and regional development, innovative projects and enterprises will be able to yield social impact and contribute to local development through sustainable private sector development, targeted skills development, the creation of jobs and economic growth.

Centred on the principle of innovation, the Botlhale Village wishes to bridge innovation between all stakeholders and bring innovative solutions and ICT applications to the public of South Africa and its broader regional environment. Considering the increased global proliferation of innovation-centred initiatives and policies, Belgium Campus wishes to filter out commonalities and present a clear-cut vision of its unique 9797ete97ionalization of innovation. More specifically, the Botlhale Village is guided by its Collaborative Innovation Model for Regional Development that envisions innovation as adhering to the following cross-cutting but specific characteristics:

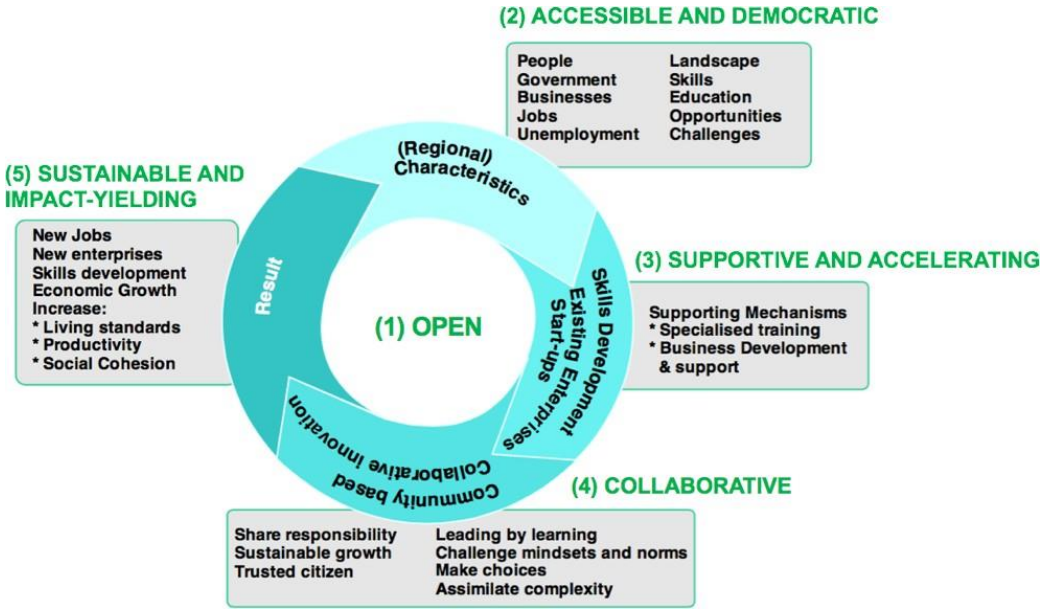
(1) Open

(2) Accessible and Democratic

(3) Supportive and Accelerating

(4) Collaborative

(5) Sustainable and Impact-yielding



COLLABORATIVE INNOVATION MODEL FOR REGIONAL DEVELOPMENT

Open innovation

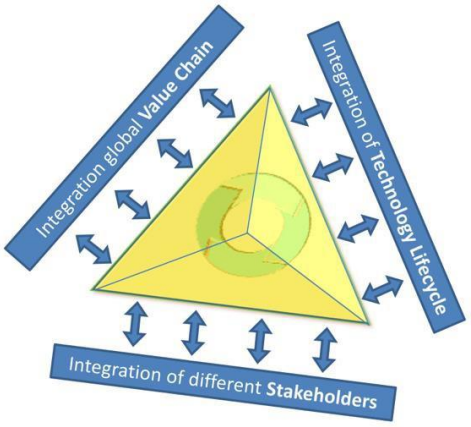
In light of the recent global shift from closed innovation models to open and open-source innovation models and from traditional organisational models to community-oriented organisational models, **open innovation** is placed at the forefront of the Botlhale's innovation ecosystem. Its Collaborative Innovation Model for Regional Development envisions the Botlhale Village fostering open innovation that is accessible and democratic, supportive and accelerating, collaborative, and sustainable and impact-yielding.

By means of fostering open innovation at the Botlhale Village, Belgium Campus highly values knowledge sharing and valorisation through continuous and extensive partnerships between relevant stakeholders, such as industry, business, academia, the public sector and larger regional society. The 9898ete98ionalization of open innovation is guided by three key pillars:

1. The Botlhale Village carries out demand- and project-driven research for innovative solutions and ICT applications.
2. The Botlhale Village offers an enabling and protective environment where innovative solutions and ICT applications are developed in an open space, where all stakeholders can opt to joint in on investing.
3. The Botlhale Village offers a supportive environment where start-ups, spin-offs, SMMEs and established companies receive support and join in on innovative research.

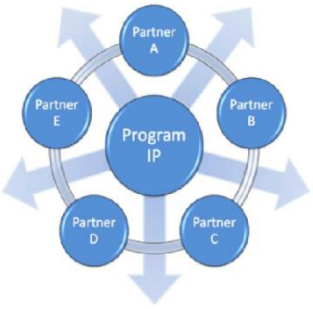
The Collaborative Innovation Model for Regional Development builds upon continuous and longstanding involvement and engagement by all economic, academic, political and social stakeholders in the regional community. The objective is to engage all stakeholders in the innovation process on an equitable basis through feedback loops between the different stages of the innovation process. In this way, Belgium Campus replaces the traditional linear model with a demand-pull model that ensures continuous feedback between R&D, design, manufacturing, marketing, commercialisation and real-life application in society. Placing market and societal needs at the forefront as drivers of the innovation and research process, the process initiates with the identification of unfilled needs and challenges in the market or larger society, by academic or educational researchers, SMMEs or external applicants to the Botlhale Village.

The Collaborative Innovation Model serves to develop a thorough and accurate understanding of the entire global value chain by pooling knowledge and experience of all stakeholders. In this way, challenges can be identified and opportunities can be discovered in order to integrate technology solutions in the entire value chain. As a result, technology becomes multi-faceted as innovative solutions and ICT applications stem from a shared source of information and are available to benefit each stakeholder in a tailored and individual way, as illustrated in the accompanying graphic. The innovative solutions and ICT applications developed through the Botlhale Village are explicitly not intended to focus purely on technology, but rather to use technology in an innovative way across disciplines, meeting each stakeholder's requirements and contributing to regional development.



CENTRE FOR INTEGRATION

Wishing to meet demands and improve processes across the entire value chain, Botlhale's goal is to transform fundamental research into applied research into the development of real-life innovative solutions and ICT applications. Drawing upon a common pool of knowledge, research and innovation projects are carried out to identify new opportunities. The Collaborative Innovation Model increases the availability of knowledge and resources to all stakeholders simultaneously. This central source of knowledge can spawn innovative



OPEN INNOVATION ECOSYSTEM (SOURCE: LRD)

solutions and ICT applications that are applicable in multiple areas and sectors. In addition, IP is characterised by reusability and recyclability according to different applications and stakeholder demands, exploring innovation opportunities in the most efficient way and protecting application-specific IP. This demand-pull model stems from Belgium Campus's philosophy to regard identified market of societal problems both as challenges as well as opportunities for which solutions and applications can be developed and transported to other areas to benefit new stakeholders.

Accessible and democratic innovation

By guiding research and innovation projects by market and societal demands and potential social impact, Belgium Campus strives for a democratisation of the innovation process. In this sense, it wishes to foster innovation that is accessible and open to all, so that every creative and innovative idea from any stakeholder holds the potential to be developed into a viable and commercialised real-life application. Belgium Campus acknowledges ideas as potentially successful and wishes to provide stakeholders with the appropriate means to develop and commercialise identified innovative solutions or ICT applications. In this sense, the Botlhale Village not only seeks to foster innovation, but also to enable innovators, expanding the scope of innovators from research institutes and well-resourced companies to students, individual entrepreneurs, SMMEs, companies and the public sector.

This goal of accessible and democratic innovation is achieved through the open participatory environment that the Botlhale Village offers its participants in order to adequately support and accelerate innovation. In addition, due to Belgium Campus's focus on advanced human capital development, research and innovation projects are set to develop solutions and ICT applications that are transparent and non-intrusive as well as intuitive and straightforward to use by end-users. Moreover, by integrating the identification of regional characteristics as the first step in the Collaborative Innovation Model, innovative solutions and ICT applications are set to benefit and improve the lives of members of the regional community as they are developed following community demand and developed according to community needs. In this way, the Botlhale Village brings innovation to the public and its larger regional environment.

Supportive and accelerating innovation

Relating to accessible and democratic innovation, the Botlhale Village identifies supportive and accelerating innovation processes as one of its key activities. In this way, the Botlhale Village provides supporting mechanisms in terms of specialised training, business and skills development. This is done in order to adequately meet the needs of the stakeholders and to yield positive impact in the broader regional community in an accelerated time span, without compromising on quality and impact.

By means of supportive and accelerating innovation, the Botlhale Village offers state-of-the-art physical infrastructure and facilities. In order to have all essential tools at the disposal of participants, the Botlhale Village provides extensive physical infrastructure such as computer barns, specialised engineering laboratories, an auditorium, exhibition space, lecture rooms, project incubators as well as residence and recreational facilities.

In addition, the Botlhale Village offers administrative, legal and management services through its SMME Business Development and Advisory Service Programme. The programme serves to provide SMMEs participating in or being developed through the Botlhale Village with expert knowledge on forming, growing and sustaining a business in addition to essential initial financial funding. The program consists of a comprehensive set of advisory services concerning different business development activities available according to the progression of the involved SMMEs.

Business planning

Support is provided through assistance with and advice on developing sound business plans, building viable business models with high impact, strategic planning for implementation, performing SWOT analyses, defining attractive business missions, establishing corporate and personal objectives, defining critical success factors and measuring key performance indicators.

Financial planning and monitoring

In order to enable participants to acquire and allocate funds efficiently and to avoid business shocks, the programme assists in framing financial polies concerning procurement, investment and administration, financial coordination, investment decisions, evaluating financial health and business efficiency, cash management, trend spotting and measurement of progress.

IP asset management

Participants of the Botlhale Village receive assistance with the protection and maximisation of their IP value, in order to ensure long-term success, generate competitive advantage and to avoid infringement risks. The program provides support mainly on technology brokering and general IP management services. Support with technology brokering includes the brokering of in-house developed patents as well as searching for specific technologies on demand of commercial partners. Support with IP management services includes support with team optimisation, IP portfolio management, assistance on IP regulations and rights, providing access to patent literature, assessment of the feasibility and market potential of an invention and the negotiation and drafting of non-disclosure agreements and licence agreements.

Legal support service

The programme provides legal support services to Botlhale Village partners, with a focus on SMMEs in the early stages of development. The programme assists them on issues such as debt collection, contract review, contractor/supplier disputes, internet security breaches, product liability issues and tax audits.

Market research

A final form of support is provided in the form of market research for SMMEs, companies as well as academic and educational researchers. This includes the gathering of information about target markets and customers (needs, size and competitiveness), assessing the market potential of new technologies, surveying of current and potential customers and enhancing the feasibility of research projects.

A key underlying principle to the objective of stimulating an enabling, supportive and protective environment for Botlhale Village participants lies in the need for accelerating incubation and innovation. By providing the necessary infrastructure and technical development tools, the Botlhale Village wishes to achieve an acceleration of the incubation and development process of research projects and SMMEs. The Botlhale Village wishes to shorten the incubation and innovation timespan of research projects and SMMEs, leading to a faster path of growth and achieved through supportive and knowledgeable guidance as not to compromise on quality and impact. For instance, under guidance of the SMME Business Development and Advisory Service Programme, research students conduct their activities in the setting of a virtual company. In this way, successful projects may lead to the creation of new SMMEs that valorise the gained knowledge and developed systems in an accelerated manner as key business development activities have already taken place. In addition, valuable time is gained in which research students can perfect their business models and improve their strategic decision-making in the timespan before commercialisation. In this sense, the Botlhale Village seeks to provide an integrated environment in which innovative solutions and ICT applications can be developed through guidance and advice throughout the different development phases and through continuous interaction with stakeholders to ensure feasibility and social impact.

Collaborative innovation

The Botlhale Village is designed in such a way as to foster a protective, research-oriented, business- driven and collaborative environment for all participants and stakeholders. In this sense, participants of the Botlhale Village work side-by-side, share responsibility and exchange knowledge and experience in an open participatory and multidisciplinary community. The Botlhale Village is centred around this partnership approach, in which all stakeholders are involved in all aspects of the

research and valorisation process, all participants contribute knowledge and expertise and decision-making and responsibility is shared.

For instance, conferences and workshops on the results and progress of research and innovation projects bring together students, academics, business and industry representatives, government officials and potential beneficiaries of the projects, stimulating knowledge valorisation partnerships, cross-fertilisation of ideas and valuable feedback loops. In this sense, participants collaborate on defining questions, needs and methodologies, carrying out research, disseminating findings and developing practical applications in an open environment where the strengths of each partner are recognised.

A key aim of this open participatory environment is the continuous challenging of mindsets and norms, by bringing together different perspectives and needs of stakeholders. For instance, the Botlhale Village wishes to acknowledge the strengths of linear innovation, while encouraging demand-pull innovation and raising awareness of present-time exponential growth patterns of innovation. For innovation to follow an exponential growth path, a mindset different from traditional ones is needed that is stimulated by extensive support services and a continuous interaction between stakeholders. This mindset involves optimism, trust, risk-taking, flexibility, proactiveness and collaboration, which is stimulated by the open participatory environment. The Botlhale Village wishes to capture present innovation opportunities by supporting linear innovation and secure future innovation opportunities by encouraging exponential disruptive innovation simultaneously, recognising that each identified need or every innovative idea carries the potential to become a commercialised, impact-yielding solution or ICT application. To achieve this, the Botlhale Village places high value on the collection and correct interpretation of validated data, recognising the opportunities of the global knowledge society in which the collection of Big Data as well as the Internet of Things provide a vast but complex pool of data information. Validated data is thus valued as a source of strategic information that can be managed in a proactive way as to incrementally improve linear innovation and to foster exponential innovation in order to create innovative solutions and ICT applications that can yield social impact.

Sustainable and impact-yielding innovation

As the intended outcome of fostering open, accessible and democratic, supportive and accelerating, and collaborative innovation, the Botlhale Village puts sustainable and impact-yielding innovation at the centre of its research and innovation activities through a continuous focus on social and community impact. In this model of demand-pull innovation, market and societal needs are the key drivers of the innovation process as the process initiatives with the identification of market or societal challenges. Every research and innovation project of the Botlhale Village is aligned with the objective of yielding social impact and improving the lives of the

community members of the region. Underlying is the Belgium Campus philosophy of transforming the observation of a problem to the identification of a challenge into the recognition of an opportunity in order to develop research and innovation projects that produce innovative solutions and ICT applications.

As all the key principles come together in the Collaborative Innovation Model for Regional Development, the 104104ete104ionalization of innovation at the Belgium Campus's Botlhale Village has outcomes that yield tangible social impact in the larger regional community in which it is present. First, the involvement of master research students and the provision of the SMME Business Development and Advisory Service Programme contribute directly to skills development in the form of creating advanced human capital development in areas such as research, innovation, business development and ICT. Second, the Botlhale Village's direct outcome is the establishment of SMMEs that are fully prepared to take on the world of business as well as invigorating existing SMMEs that are equipped to reinvent their competitive advantage. Third, as a consequence of the former, new jobs are created, leading to increased employment and economic growth in South Africa and its larger regional environment. Finally, through a continuous focus on social impact, innovative solutions and ICT applications developed through the Botlhale Village benefit communities by increasing living standards as well as fostering productivity and social cohesion, positioning the Belgium Campus's Botlhale Village as a contributor to regional development.

References

Products

Botlhale Village's product development and valorisation are presented in the attached file named **BV PRODUCTS.ZIP**.

Chapter 10 Curriculum design

An academic programme defines its objectives as the purpose and desired achievement of the programme and outcomes as the measurable skills, knowledge and attitudes that students achieve through the programme. The modules that compose the programme are the artefacts that yield the outcomes of the programme and fulfil the purpose of the programme through their contributions and coherent cooperation to provide the programme outcomes. Each module has a purpose which must align with the purpose of the programme and outcomes that serve the achievement of the programme's outcomes. This means that each module must be a necessary component of the programme, while the totality of all module components is required as a sufficient condition to reach the programme's objectives and deliver its outcomes.

The programme defines a curriculum as a prescriptive element constituting the academic plan to achieve the outcomes of the programme. Each module, or programme component, defines a syllabus as a descriptive element defining the content to be covered and tested to determine competency in that component. This serves as a contract between the teacher and student regarding all expectations related to content, deliverables, behaviour, assessment and all logistical arrangements for the module.

Design and development

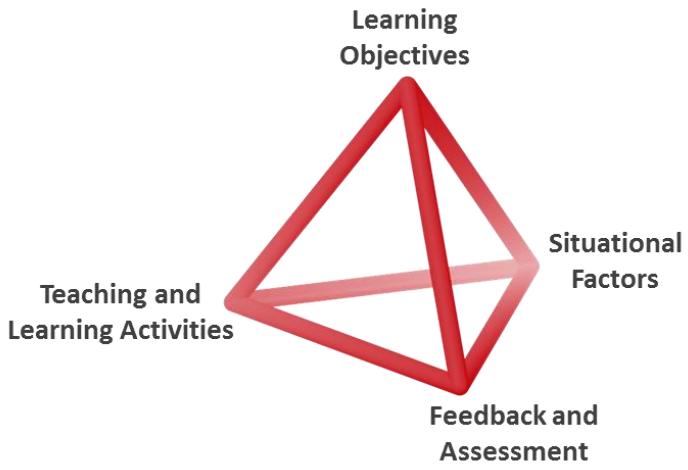
Instructional design is the practice of creating instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and engaging[i]. The process consists broadly of determining the current state and needs of the learner, defining the end goal of instruction, and creating intervention to assist in the transition. The process is informed pedagogically and takes place in this context in a teacher-led contact setting. The outcome of this instruction is observable and measureable and is intended to culminate in conferring of an academic qualification that attests to the achievement of the outcomes of an academic programme. The field of instructional design is historically rooted in cognitive and behavioural psychology, though recently influenced by constructivist thinking.

Teaching engages in two closely related, but distinct, activities. The first of these is designing the programme or individual module by gathering information and making a number of decisions about the way it will be taught. The second consists of engaging in teacher-student interactions as the course that was designed is implemented. This concept of teacher-student interaction is used broadly to include lecturing, leading discussions, running laboratory experiments and explorations, advising, and communicating by various diverse channels. In order to teach well, it is

necessary to be competent in both course design and teacher-student interactions. The ability to design well is often the limiting factor as many teachers receive little training in how to design academic components. During the last several decades, research on higher education teaching and learning has led to new design ideas that have essentially raised the bar in terms of what is possible. These include ideas such as *active learning*, *significant learning* and *educative assessment*; and models such as ADDIE (analysis, design, development, implementation, and evaluation) and ICD (integrated course design).

Design model

The model adopted by Belgium Campus is based on the same components found in most models of instructional design, assembling these components into an inter-related, integrated model rather than a linear one. The essential components are identified as:



INSTRUCTIONAL DESIGN MODEL

- Identify and analyse the ***situational factors*** (*What is the backdrop against which important decisions about the course will be made?*),
- Formulate the ***learning objectives*** (*What do the students need to learn?*),
- Design the ***feedback and assessment*** procedures (*How ill the teacher and students know if the objectives are accomplished?*), and
- Select the ***teaching and learning activities*** (*What will the teacher and students need to do in order for students to achieve the learning objectives?*).

It is important to recognise the inter-relatedness of these components. It is critical to ensure that these key components are integrated, that is, that they support and reinforce each other. The image of a tetrahedron whose vertices represent the components was purposely chosen to reflect this fact.

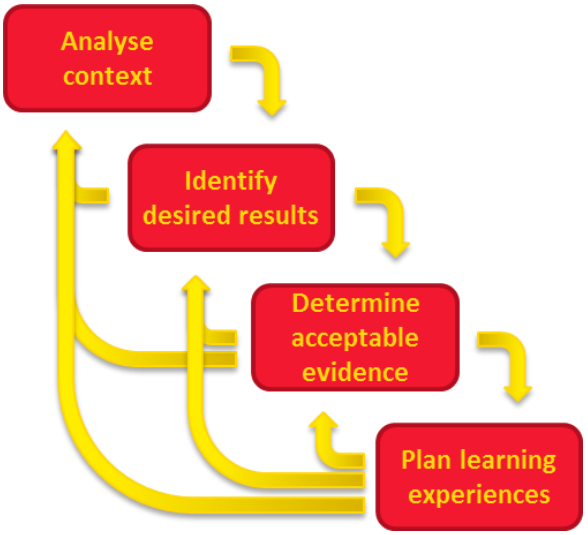
No vertex can be removed from this tetrahedron without the endeavour "falling flat". Each component is required in a good design and each component is related to each other component. Each component is necessary to the design, but no subset is

sufficient for an efficient, effective and engaging design – all components must be present, properly designed and mutually interacting to yield the desired output.

Design process

Instructional design methodologies abound and each has its champions and detractors. Unstructured approached usually result in designs that are incomplete or where the constituent components are poorly aligned. Strict top-down approaches, such as BACKWARD DESIGN, are criticised for yielding designs that are too abstract and unrelated to the exigencies it intended to address. Conversely, bottom-up approaches, such as PEBBLE-IN-THE-POND, yield designs with narrow focus on the activities in mind at the outset and lacking in holistic objectives. Iterative models, such as ADDIE, may cycle continuously and fail to reach a satisfactory conclusion. It is not expected that a panacea exists, but the strengths of various methodologies may be extracted and recombined into a coherent, fit-for-purpose method.

Belgium Campus elects to utilise a design process that is simple, flexible, controllable and potent.



INSTRUCTIONAL DESIGN PROCESS

It may be pictured as getting ready to undertake a journey. Consider the landscape to be traversed and the resources at your disposal to enable travel. Decide where you wish to end up. Know how you will be able to tell that you have reached the destination. Plan the routes for the stages of the journey and select the modes of travel for these. When you hit a snag, return to an earlier level and adjust the itinerary as necessary, then resume planning from there.

This flexibility in moving downward or upward as required enhances the final product and engages design team members whose personalities naturally prefer one approach over the other. Since any level need not be completed in its entirety before continuing, there is cross-pollination of ideas and the ability to parallelise the process as sub-teams address specific areas.

Each step in the process takes input artefacts from previous steps and utilises guidelines and worksheets to generate its output artefacts. Criteria are applied at checkpoint steps to evaluate the quality of the product and direct the flow of the process as a result of this analysis. The design project manager is able to track and

direct the process to exert the necessary control to ensure that superior academic programmes result from the process.

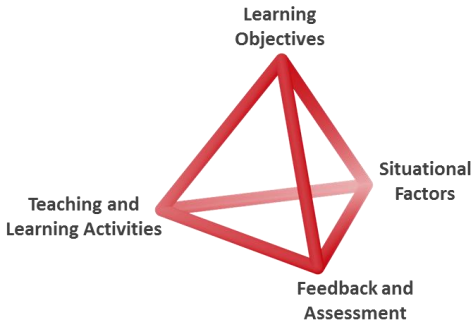
In designing a course, information is gathered and decisions made about how the course will be taught. Both these activities need to be engaged in to ensure there is a high likelihood that the students will have a significant learning experience.[ii] In order to do this, it is necessary to work through the course design process in a systematic way, completing each step before continuing on to the next one. This is important because the later steps build on the earlier ones. Insight gained in later steps will cause earlier steps to be revisited to improve the artefacts created in those steps. When this occurs, it is important to systematically revisit the successors to the revised step, to cascade the improvements to all dependent artefacts and ensure maintenance of connections, inter-relationships and coherence of integration. The design process should be managed as a formal project, exploiting the techniques of project management to add value and deliver a high-quality product.

The design process consists of three major phases:

1. **Initial design phase**: Building strong primary components,
2. **Intermediate design phase**: Assembling the components into a coherent whole, and
3. **Final design phase**: Polishing, assuring and delivering the product.

Initial design phase: Building strong primary components

The primary components of the design are located at the vertices of the tetrahedral model. The first component in the model is to gather information about the ***situational factors***, for example how many students are in the course, and what kind of prior knowledge are the students bringing to the course about this subject. This information is then used to make the three major decisions about the course, as described in the next steps.



After gathering the information about the situational factors, the first decision is about the ***learning objectives***, i.e. what the students should get out of the course. What is important for them to learn and retain, two to three years after completing the course? What kind of thinking or application abilities should they develop? How should they keep on learning after the course is over?

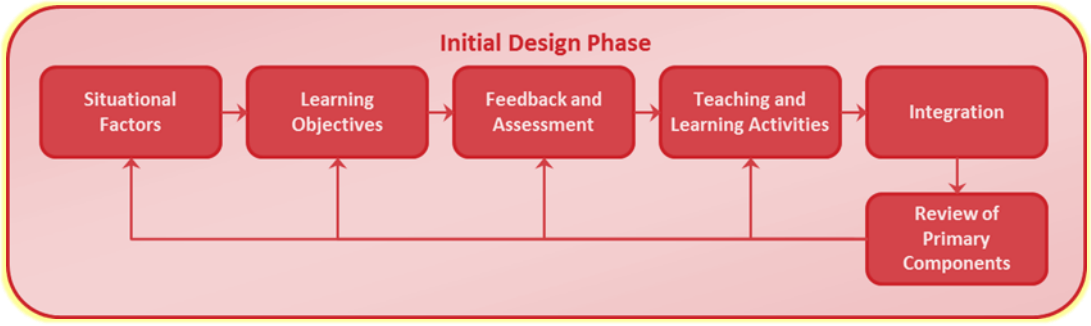
Attention then turns to decisions about ***feedback and assessment procedures***. The basic question here concerns what students will do to demonstrate they have achieved the learning objectives set for the course. This usually involves (paper or electronic) tests, but other activities need to be included as well. The advantage of

working on the feedback and assessment at this early stage of course development is that when clarity is achieved about what constitutes successful student performance, it is much easier to develop effective teaching and learning activities.

Now the appropriate and necessary ***teaching and learning activities*** need to be formulated. If there are significant learning objectives and effective assessment procedures, it is likely that some kind of active learning needs to be incorporated into the course.

Finally, the course design must be checked for ***integration*** to make sure all the components are in alignment and support each other. Are the learning activities consistent with all the learning objectives? Are the feedback and assessment activities consistent with the learning objectives and the learning activities?

This planning model provides specific criteria for assessing the quality of the course design. Five primary criteria are identified for use in a ***review of the primary components*** created during the initial design phase. If the course design rates highly on each of these criteria, then the basic components of good design are in place and the process advances to the intermediate design phase, else the identified deficiencies are addressed by returning to the appropriate step of this phase.



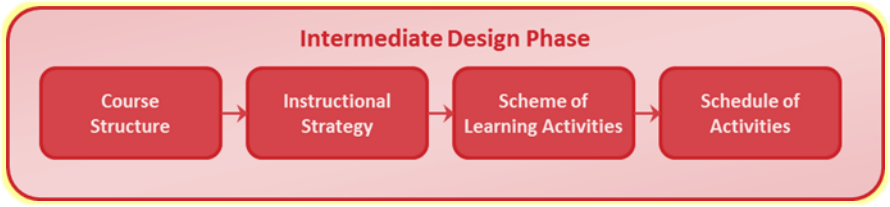
Intermediate design phase: Assembling the components into a coherent whole

After creating the basic components of the course in the initial design phase, it is now time to identify ways of organising these activities into a powerful and coherent whole. This is done by first creating a ***course structure***, which is a structured sequence for the content of the course.

Then an ***instructional strategy*** must be selected or created. This is not the same as teaching techniques. A teaching technique is a discrete, specific teaching activity, while an instructional strategy is a set of learning activities, arranged in a particular sequence so that the energy for learning increases and accumulates as students go through the sequence.

The next step in this phase consists of integrating the structure and strategy into an overall ***scheme of learning activities***. This step includes the principle of addressing the need for differentiation and integration of learning activities.

Upon conclusion of these steps, it is now possible to lay out the weekly and daily ***schedule of activities*** for the entire course. This phase has now yielded an integrated set of components assembled into a coherent whole and it is possible to advance to the final phase, in which there are a few additional tasks to complete.



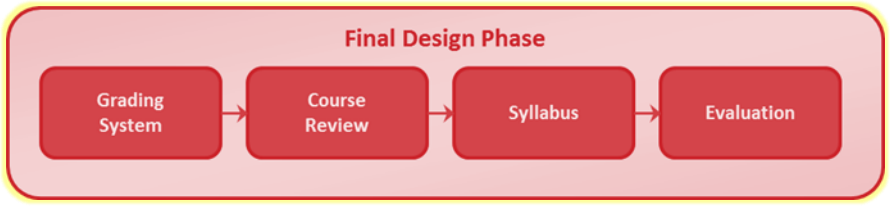
Final design phase: Finishing the product

Several important tasks remain to be undertaken in order to complete the design of the course. The first of these is to develop the ***grading system*** for the course to reflect the full range of learning objectives and activities.

The design should now be debugged by analysing and assessing the design of the course. This ***course review*** should check the feasibility of all proposed components, the logistical needs for resources, and plan for any contingencies which may arise.

The ***syllabus*** must be created to communicate all the necessary information regarding the course to the students. This will serve as a contract between the teacher and the students and should be supplied in the form of a study guide at course commencement.

It is very important to plan an ***evaluation*** of the course itself and of the teaching during the course. This is the only way to get the information and insights needed to make the course better and to improve teaching over time.



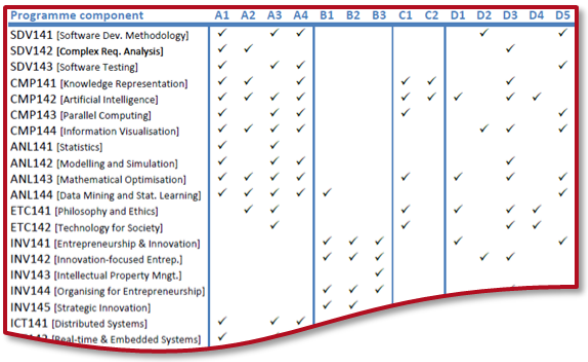
Verification and validation

Verification is the process of determining whether a programme was designed correctly. It evaluates the programme and its components to determine whether the products developed satisfy the initial conditions imposed. Validation involves determining whether the right programme was designed, whether it is what is required. It evaluates the programme and components to determine whether it satisfies the requirements specified by the situational factors.

Whereas there is an art and a science to the design of an academic programme, verification and validation require a greater focus on objective, formal methods to evaluate the design.

Outcomes

The outcomes of a programme should be specified in terms of the level descriptors of the NQF. This is essential, since it will be used in the external quality assurance performed by the CHE to determine whether the proposed programme for the qualification is pegged at the right level for the qualification type.



Programme component	A1	A2	A3	A4	B1	B2	B3	C1	C2	D1	D2	D3	D4	D5
SDV141 [Software Dev. Methodology]	✓		✓	✓							✓			✓
SDV142 [Complex Req. Analysis]	✓	✓										✓		
SDV143 [Software Testing]	✓		✓	✓										✓
CMP141 [Knowledge Representation]	✓	✓		✓				✓	✓			✓		
CMP142 [Artificial Intelligence]	✓	✓	✓	✓				✓	✓	✓		✓	✓	
CMP143 [Parallel Computing]	✓		✓	✓				✓						✓
CMP144 [Information Visualisation]	✓	✓	✓	✓							✓	✓		✓
ANL141 [Statistics]	✓		✓											
ANL142 [Modelling and Simulation]	✓		✓	✓								✓		
ANL143 [Mathematical Optimisation]	✓	✓	✓	✓				✓		✓		✓		✓
ANL144 [Data Mining and Stat. Learning]	✓	✓	✓	✓	✓									✓
ETC141 [Philosophy and Ethics]		✓	✓					✓		✓		✓	✓	
ETC142 [Technology for Society]			✓					✓				✓	✓	
INV141 [Entrepreneurship & Innovation]					✓	✓	✓			✓				✓
INV142 [Innovation-focused Entrep.]					✓	✓	✓				✓	✓		
INV143 [Intellectual Property Mngt.]							✓							
INV144 [Organising for Entrepreneurship]					✓	✓	✓							
INV145 [Strategic Innovation]					✓	✓								
ICT141 [Distributed Systems]	✓		✓	✓										
[Real-time & Embedded Systems]	✓													

Internal consistency may make use of a curriculum map or matrix to aid in conceptualising how different components of the curriculum work together as a whole to deliver the programme outcomes and identify any gaps in the curriculum.

Volume of learning

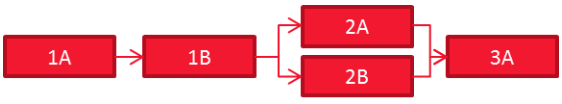
The volume of learning required to achieve the outcome is quantified in terms of notional hours, which represent the time required by an average student to complete the learning activities associated with a component. The total notional hours required for a component is the sum of these requirements for all activities, including contact lecture time, practical exercises, self-study, reading, assessment and the completion of homework, assignments and projects.

This value is then quantised and expressed in terms of credits, where one credit equates to ten notional hours.

Sequencing

The pre- and corequisites of any component or module determine the sequencing of that component in the curriculum in relation to other components. It is essential that such requisites be present, since they indicate that modules build on each other and that there are relationships between different bodies of knowledge which are integrated into deeper learning.

Depth and breadth



The depth of a programme is indicated when it contains sets of modules from the same field that exhibit a progression as they build on each other. Breadth is indicated by the variety of such areas within the programme, that also

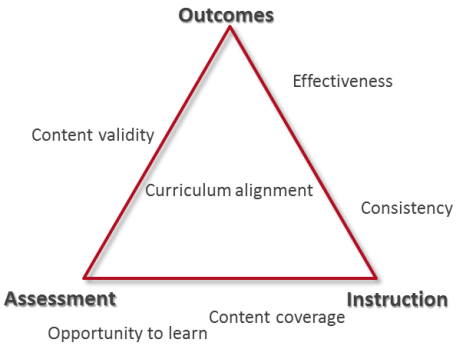
have relationships with each other to build a coordinated, consistent and integrated whole.

Theory and practice

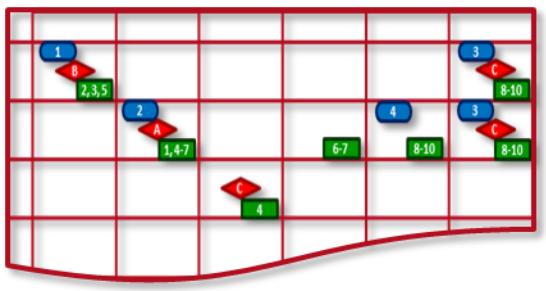
In the design of learning activities, it is not only necessary to ensure that the fundamental theoretical aspects are covered, but also that sufficient practice-oriented activities are included to support and reify these. In this, the example of Alan Turing should be followed, who not only defined Turing machines as the theoretical representation of computers, he built actual computers to solve real problems such as cracking the Enigma code.

Alignment and consistency

Several techniques are available to evaluate the alignment of curricular building blocks from various perspectives.



Anderson proposes[iii] an integrated approach that may be employed to analyse factors such as curriculum coverage, opportunity to learn and curriculum alignment. Nineteen cognitive processes are defined for learning that are mutually exclusive and together delineate the breadth and boundaries of learning.[iv] These may be grouped into six categories. The knowledge objects on which these cognitive processes operate may similarly be categorised in various ways, in the simplest instance into four categories as stated by Krathwohl and cited by Pintrich.[v]



Mapping the outcomes, assessments and instructional activities of a component into a matrix with cognitive processes and knowledge as dimensions enables the analysis and evaluates of the component from various perspectives. The visual representation of the matrix provides an immediately intuitive view of the component under investigation and suggests areas where more detailed consideration is warranted. The granularity of the analysis may be adjusted suitably from the broad categories shown here to more detailed specifications or the addition of another dimension to represent complexity.

This is useful beyond alignment to ensure consistency and cohesion of the curriculum and its components. It also provides an early opportunity to plan to raise learning targets and improve instruction. Towards these ends, ways and means are explored to:

- Engage students in increasingly more worthwhile educational experiences;
- Increase the dispositions of lecturers to convey caring attitudes toward students;
- Link the topics and objectives of units within the curriculum; and
- Match instructional activities to student characteristics.

Planning for these enhancements in advance allows purposeful and effective techniques to be employed during delivery of modules.

Review and renewal

A programme or module design is not a static artefact. The content of any course, especially within the constantly evolving field of information and communication technology, will continuously be updated to ensure students are prepared to enter the industry with knowledge and skills that are up-to-date, valuable and fit the requirements of employers. Secondly, new pedagogical theories and the experience gained when delivering a course will provide insights and inspiration to improve any course. Constant striving to improve quality is one of our operating principles and an enabler for fulfilling our mission.

The course should be reviewed and adapted after each delivery. Think in terms of making 1st-order, 2nd-order, and 3rd-order changes. This simply means that on the first attempt to improve the design of the course, focus only on a few changes. Be sure to make some changes in each of the three phases, because each affects and reinforces the other. For example, start by making changes to the strong primary components (initial design phase):

- Do a somewhat more in-depth analysis of the situational factors,
- Add one new kind of significant learning to the list of learning objectives,
- Add one additional kind of educative assessment,
- Add one new kind of active learning in which the students engage, and
- Check to make sure the components are integrated and aligned.

With these strong primary components in place, work on assembling these into a more coherent whole (intermediate design phase):

- Clarify or simplify the structure of the course,
- Create a differentiated set of learning activities, perhaps using the *Castle Top* technique, and
- Lay out some kind of scheme for the overall set of learning activities.

With a coherent scheme of learning activities, the remaining tasks can be addressed (final design phase):

- Coordinate the grading system with the design of the course,
- Debug potential problems,

- Put together a syllabus that communicates the design of the course more clearly, and
- Plan a more thorough evaluation of the course and of your own teaching.

Each time a course is taught, make an assessment of how well the design worked and next time, make another, more ambitious set of changes. In this way, work through 2nd-order changes, followed by 3rd-order changes, and so forth.

The purpose of instruction and learning activities is the promotion of student learning. All decisions relating to a given course or other learning experience, from the selection of reading materials to the assessment process, should be judged by their contribution to this end.

The quality of these decisions is a function of how well the course is designed and how well the design components are integrated.

An integrated course design requires a significant investment in time, energy, and thought. But, this expenditure has great potential for exerting a potent effect on students' acquisition of significant learning, as opposed to trivial learning. Faculty members committed to improving their ability to facilitate significant learning are encouraged to adopt, and adapt where necessary, this design process. The potential and power of this process are exploited to improve both teaching and learning. Serious commitment increases the power and effectiveness of those responsible for the quality of other people's learning experiences.

References

Curricula	Information and artefacts regarding content and design of curricula are available for inspection.
Evolution	Information regarding the evolution of curricula through redesign and renewal are available for comparison with current curricula.

[i] Merrill, M.D. et al (1996). "Reclaiming instructional design". EDUCATIONAL TECHNOLOGY, 36(5): 5–7.
[ii] Fink, D.L. (2003). CREATING SIGNIFICANT LEARNING EXPERIENCES: AN INTEGRATED APPROACH TO DESIGNING COLLEGE COURSES. Hoboken: Jossey-Bass.
[iii] Anderson, L.W. (2002). "Curricular alignment: A re-examination". THEORY INTO PRACTICE, 41(4): 255–260.
[iv] Mayer, R.E. (2002). "Rote versus meaningful learning". THEORY INTO PRACTICE, 41(4): 226–232.
[v] Pintrich, P.R. (2002). "The role of metacognitive knowledge in learning, teaching, and assessing". THEORY INTO PRACTICE, 41(4): 219–225.

Chapter 11 Internationalisation

The name Belgium Campus already suggests a link to the country Belgium, though it must be strongly stressed that the institution itself is completely based on South African legislation and quality management requirements, and on the local (South) African realities. So there is an innate tendency to cater for local and (inter)regional needs, but with an international perspective.

The working of the internationalisation processes at BC is based on the overall vision, mission and values of BC.

This text when first conceived was largely composed in cooperation with the strategic partner UCLL. In the course of the writing of the text it was peer reviewed and benchmarked in a consultation round involving international coordinators in Belgium, Sweden, Germany, the Netherlands and South Africa. There are some additional requirements set by the South African DHET. Belgium Campus has developed a roadmap to comply with these requirements.

Rationale

There are international operations and activities that take place in BC, and BC has proven to be a reliable international partner. Belgium Campus looks at a whole series of modern developmental issues all over the world. This includes the Bologna Process in Europe and the advent of the EHEA. Belgium Campus recognizes the inherent importance of the development that was initiated by the Bologna Process, which went way beyond the mere transformation of the structure of higher education. This, in combination with EU programmes such as the Erasmus and Erasmus Plus programmes, has been very important for us to shape our view on the world. Further, the new programmes allow African partners to participate, which basically is the development of the new era.

Another important influence in the setup and the operational approaches of the Belgium Campus, especially with regard to the creation of vision and values, is the work of the United Nations. The Sustainable Development Goals are a source of inspiration and has helped to define a number of strategic choices, such as the focus on personal and community empowerment, with special approaches for the weakest and the unprivileged but gifted students. Belgium Campus is a committed institution and invests a lot in community engagement.

Internationalisation has been an American and European affair for a long time, but Africa is picking up. We have seen the establishment of a number of university networks in Africa. Up to now, it has proven difficult for Belgium Campus as a private institution to take part in them, but we are in touch with some of these networks.

Further, there is now the very important document **DRAFT POLICY FRAMEWORK FOR THE INTERNATIONALISATION OF HIGHER EDUCATION IN SOUTH AFRICA**, published by the Department Higher Education and Training RSA, which will lead to a government policy paper. And there is the recent publication **THE GLOBALISATION OF INTERNATIONALISATION – EMERGING VOICES AND PERSPECTIVES**, in which colleague Nico Jooste of the Nelson Mandela Metropolitan University has published interesting examples of international activities and policies in South Africa.

The manner in which BC is now evolving with a multicampus approach, the establishment of Botlhale Innovation Village and the starting up of the master programmes demand a more coherent and sustainable approach. There is a need for an authentic baseline, there must be a policy regarding the internationalisation of the institution, instruments and processes have to be developed to realise the goals set out in the policy plans, there must be an action plan and there is a need for instruments and people need information and training.

The instrument that is being developed on the basis of this indicator list will be used for four purposes:

1. It is a management instrument to help achieve the objectives (policy foundations and preparation, policy definition, policy execution and monitoring).
2. The use of such an instrument will allow the institution or its sub-units to create a specific profile in a specific context; a specific development model can be chosen to be used.
3. The instrument is a tool to prepare for quality control and to prove that objectives have been met.
4. An instrument like this will enable objective benchmarking.

The various official visits of the external expert committees, preceded by the introspective self-evaluation reports that are part and parcel of the accreditation experience in various study programmes proved to be eye-openers. It was felt that future institutional audits would be even more challenging and that therefore the existing texts needed updating and active implementation.

Vision of internationalisation

The internationalisation of BC helps realise the overall mission and objectives of the institution in the domains of education and training, research and development, and community engagement and other third task challenges. The globalisation of the world will entail the further and wider internationalisation of higher education. The objectives, processes, results and impact of the BC internationalisation activities are an answer to the explicit and implicit development of higher education and the

consequences of globalisation. We take it upon ourselves to train people to be employable in the various contexts of the globalised world. Our graduates have the competences and skills to keep developing themselves within their respective living and working contexts, and they will help contribute to the development of our society and its communities.

Our graduates have to be ready to be engaged in a fast-evolving world. We live in a time of change and we live in the change of times. We prepare our students for this by investing in the integrated internationalisation of and in the institution. They are given a specific student experience because internationalisation is a mainstream issue to be experienced transversally throughout the whole institution in all its working domains, in education and training, research and development and in the third task assignments and community engagement. The experience is accomplished by the organisation of the mobility of BC students, staff and other employees. The IaH concept is further developed, implemented and integrated in all our activities. This is realised by strengthening the internal processes, by giving a prominent place to internationalisation in our strategic networking both domestic and abroad, by participating in the development of new internationalisation projects and methods. In order to reach the objectives specific parameters and procedures are defined, specific targets and performance indicators, to be achieved within a certain timeframe. The priorities will be outlined in the three task areas of BC by means of the realization of the objectives in four general development domains:

1. By developing and realizing the targets that are explained in the vision, which will be regularly adapted to comply with the needs created by the changes that take place in an international framework. This approach is to lead to effective and sustainable policy definition and good governance.
2. By developing, activating and managing an adequate system that will make the activities possible, together with the development and employment of the necessary instruments, to help with the development of an international curriculum and an international framework for research and development and community engagement.
3. By developing and unlocking the human potential that is present in BC.
4. By actively contributing to a quality culture that complies with international standards, by investing in quality and sustainability to make sure that the internationalisation processes, their outcomes and their impact will be consolidated and valorised.

Mission in the context of international development

The new 21st century will be different. We are witnessing exceptional changes, major changes that will have an impact that we have only seldom seen. As an HEI BC must

be able to read these changes and respond proactively and adequately. These changes are being manifested as a worldwide global interaction that is happening on all domains and departments of science and technology, economy, social development, politics, the arts and cultural and spiritual life. Globalisation is happening and is a fact, multiculturalism is happening, and is a fact. The way we are doing business, produce goods and services, participate in and create culture, develop the architecture of our societies, organise our education is influenced by major waves of change we often cannot control. This has far-reaching consequences, is significant for the fabric of our society and touches our individual lives. The old models are spent and worn out and need to be changed and improved. We are being challenged to come up with new methods while everything keeps changing around us. A great source of inspiration is the set of sustainable development goals as developed by the United Nations.

Belgium Campus is embedded in a regional and a cross-border context and as such we are co-responsible for the future of our country and region. BC must be sure to help enable the development and the constant increase of capacity in the regions we are active in, and in the whole of South Africa in order to be able to actively, efficiently and effectively participate in the new contexts that are being created. Whether or not we will be successful largely depends on how we prepare and train the citizens of tomorrow, how we are embedded in our society and how we contribute to research and development and the arts.

BC has a young but staunch tradition of internationalisation. In the beginning it was a niche activity, chiefly focusing on the student: to enable students to go on an internship in Belgium, soon followed by the participation in Erasmus Mundus, which enabled our graduates to take a master course in Europe. But soon it was recognised that this was only a limited basis for the internationalisation of the institution and the objectives and processes were adapted and increased. Internationalisation has indeed become a mainstream aspect of the institutional operations, integrated with and within the other activities of the institution. It is an excellent example of an integrated and transversal approach. There is the well-established mobility of staff and students, in all its forms and purposes, but the Internationalisation at Home (IaH) concept is taken as a major transformation engine, as is shown in the projects in the virtual classroom, creating virtual international contexts, and even meetings abroad. But IaH is also a metaphor in itself; it represents the continuous and ubiquitous transition and change management of the objectives, structures, curriculum, the impact, and quality culture of the institution, inspired by and inevitable because of the international development. BC is on the ball, alert, competent and efficient in that field, the outcome of the survey of the Flemish Department of Education tells us this, but at the same time we realize that the work is never done.

Prosperity is a precarious good, and prosperity, the creation of social and intellectual capital is in fact our core business. In a global region as that of Southern Africa, in a country such as South Africa and in a province such as Gauteng – and others to follow – we are to play a key role in the foundations of a positive development. This understanding must lead to an unambiguous institutional policy that will lead to the firm embedding of the institution in the society and region we serve. We need to make available our expertise at a larger scale than we are doing now to the development of our region in order to support and engage in a modern renaissance. Our engagement will have to be considerable; we will train students and offer lifelong learning opportunities. We wish to prepare our students to become exceptional global and cosmopolitan citizens. They will be citizens of a globalised world who will be able to actively promote the values of a democratic and sustainable fair society. They will contribute to the progress of the world in both ordinary and exceptional accomplishments of their work, in research and development. The way BC will further internationalise education, research, development and community engagement will have an especially important impact.

Goals

Basically there are four major goals that have been defined and in all four goals there are international activities that take place:

1. Belgium Campus wishes to be an international(ised) institution;
2. Belgium Campus develops Internationalisation at Home activities;
3. Belgium Campus develops an internationalised curriculum; and
4. Belgium Campus wishes to be a (preferential) partner in (international) networks or networks that have an internationalising impact in Southern Africa.

An international(ised) institution

The outlook of Belgium Campus is based on the South African situation and the relationship with the members of the "quadruple helix", but as stated above, because of its origin the institution has a strong innate international commitment too. This has indeed to do with the origins of the institution, but also of the academic focus itself: both in the disciplines, and in the character of what higher education is supposed to do – teaching and learning, research and development and community engagement. Belgium Campus academics therefore look for inspiration, cooperation and development in the wide world to locate partners. Also large and small international organisations (e.g. UN, OECD, UNESCO, PASCAL, NGO COMMEET), institutions (university partners, BBTK, Cabinet De Croo, VLIR-UOS), university networks (Businet) and companies (Microsoft, Siemens, IBM), will play an important role in this. These contacts offer cooperation and collaboration, which is translated into curriculum development and delivery, international student and staff exchange, international project (funding) in development and in research.

In order to be able to create bridges between Africa and the rest of the world, Belgium Campus has been organising regular quality benchmarking for more than 15 years to see if the quality is on par with European quality, based on the NVAO (ECA/AQAR) models. At the same time Belgium Campus adheres to all South African regulations for recognition and accreditation. People from outside Africa are part of the Board of Directors, staff and student population.

Internationalisation at home

The sad reality is that most SA students and staff do not have enough financial means to participate in international exchange, but there is exchange however. Also the capacity of the institution is limited. From the beginning BC has therefore followed the Internationalisation at Home concept, so the student and staff experience will be given an international outlook. This can be made explicit in the following approaches:

1. People in the management positions follow the international evolutions regarding educational development. They participate in international conferences, invite people from overseas for discussions, dialogue and possible cooperation and collaboration.
2. Management and institutional development is done against an international backdrop, e.g. development of Botlhale Innovation Village, the roadmaps, the learning Factory Model. Benchmarking the institution and the programmes is done on a regular basis.
3. Campus Diversity: there is a specific student campus experience. There are quite some students of non-South African origins, and there is an international staff component. There are incoming students from partner institutions.
4. Virtual classroom: multinational teams work on development projects (project-based learning) which produce real products. This is done via the use of ICT and video means.
5. Teaching and classroom: there is diversity on campus, and specific importance is paid to the introduction of ICOMs (International and Intercultural Competences) as part of the curriculum targeting the development of a number of generic and meta-cognitive competences, there are international weeks with incoming students and there is the leadership programme.
6. Curriculum transformation
    1. Core discipline: the content of the programmes is always done with input from international stakeholders, consortiums, organisations and companies which will be the future employers of the students.
    2. Participation in Erasmus Plus projects (e.g. capacity building)
    3. Extension of the Virtual Classroom
    4. Introduction of international weeks

Internationalised curriculum

BC answers to the following questions: Global context (what is the world we live in and what do we want/what can we do to help?), National Context South(ern) Africa

and how we do we address the developmental challenges (e.g. by means of our CDLS projects (Community Development through Service Learning), in which foreign incoming students are involved), and what is the institutional context: what to teach and research – always an international input, and how to deliver the curriculum. This is linked to elements of the informal curriculum (hidden/interstitial curriculum, e.g. the Belgium Themed teaching and learning environment, involvement of embassy and Flemish representatives, etc.).

1. All this is found in the offered and experienced curriculum.
2. Exchange possibilities: a number of students can go abroad on an exchange programme (traineeship and international weeks as a result of the products of the Virtual Classroom projects).
3. Hidden Curriculum: code of conduct

Partner in international networks

It is important that BC is recognised as a quality institution with international ambitions and connections.

1. Belgian Embassy/Flemish Community – example of good practice of Belgian work in SA
2. BC is PASCAL board member for SA
    a. Participate in the PASCAL development
    b. Organising PASCAL conference
    c. Writing of book
3. BC is showcase partner of NGO COMMEET (NL/B)
4. Bilateral agreements
    a. There are a number of bilateral and multilateral agreements for collaboration and exchange with international universities and University Colleges
    b. There are more contacts and operations, not (yet) covered by an MOU/MOA; for some partners it seems to be difficult to officialise cooperation with such a document
5. North-South-South
   Multilateral agreement between UC Limburg and UCLeuven, together with BC, University of Venda and CPUT, to set up a South-South cooperation, supported by the Northern partner(s)
   Also there is the participation in multilateral partnerships within ERASMUS MUNDUS (EMA2SA, EUROSA)
6. Strategic partner
   BC Is one of the strategic partners of UCLL (Belgium). Work and development is done on a strategic level. Beside these, BC also considers the following institutions as strategic partners for the own evolution: KULeuven, PXL, Penn State University, Fontys Hogeschool, HS Artevelde, etc.

7. PASCAL
8. Businet
   BC is the first African member of the International Network BUSINET. Within this network there are conferences, staff and student exchange (in house: international week, the so-called International BusIT week)
9. BC was invited and nominated by European Business Assembly Oxford / Academic Union "Excellence in Quality"
10. BC also follows a number of international networks, organisations and consortiums to update their policies and strategic goals. To that aim the activities are followed of organisations such as PASCAL, GUNI, UIIN, etc. in order to find out where the modern development of society and education is going. BC members participate actively in international conferences and also organise international meetings, such as the Annual PASCAL Conference 2017.

Opportunities

Because it is not feasible or affordable for BC students to go abroad, often because of financial concerns, BC initiated a programme of "Virtual Classroom" activities. The aim of these programmes is to work on a specific problem/project, conduct a study as part of the research capacity building of the students under the guidance of the professors and Botlhale Village, and develop a solution, test it and produce a product for the problem or project. Examples of this innovative development learning and development can be found in the projects for Smart Farming, Boeing and Lockheed Martin, etc.

These projects are executed with an international team where each of the international partners brings their own specialty to the project. It is coordinated by the team of lecturers and the tasks are divided. These multidisciplinary international teams cooperate making use of Skype and other ICT means.

BC invests in the organisation of these so-called Virtual Classroom programmes, where interdisciplinary international teams work on innovation and research/development as part of project/problem based learning approaches. These programmes are all integrated in the standard curriculum. It was after careful consideration that BC chose this approach; in doing so the South African students are exposed to international influences in the course of their cooperation with the other international partners. This gives them the opportunity to hone their international skills and knowledge and intercultural competences. This is certainly so because of the fact that interdisciplinary teams are formed who have to cooperate together. If there is any sponsorship, as it has happened, we strive to bring the teams together in an international meeting, where the students can physically meet after completion of the project and the delivery of the project product.

Some students are able to go on an international internship abroad, as part of their curriculum. This happens in accordance to the bilateral contracts with international

universities and companies where the students can do a traineeship in a relevant company or organisation. These companies then pay the students a small fee for their lodgings and keep.

These international experiences are part of the curriculum and therefore they are graded and this counts towards their final results.

Students are assisted by the academic services, on campus and by an international liaison officer abroad, together with the colleagues from the partner universities and the companies and organisations where they are doing their internship.

Incoming international students are also looked after by the academic services of Belgium Campus, in accordance with the standing bi- and multilateral agreements.

To that aim there is an international liaison officer who is working from Belgium.

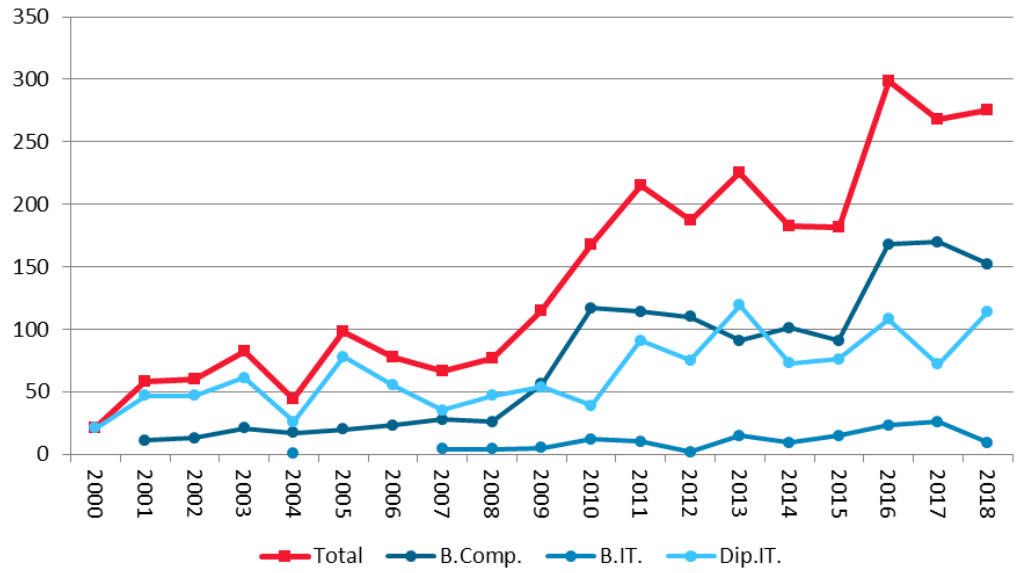
References

Annual PASCAL conference

BC hosted the conference in 2017, reference at http://conference2017.pascalobservatory.org.

Chapter 12 Performance data

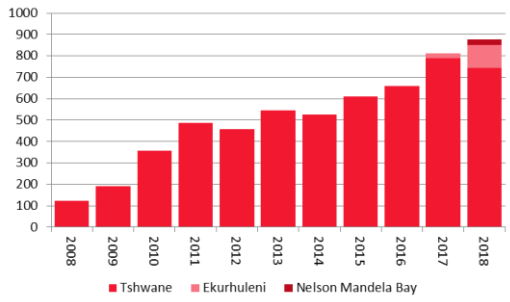
Cohorts



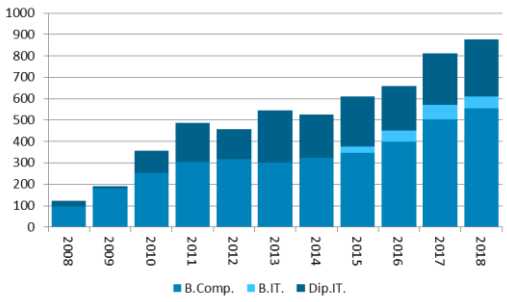
COHORT HEADCOUNTS

Enrolments

Annual enrolments during any academic year of course consist of students from multiple cohorts, as academic programmes extend over several years.



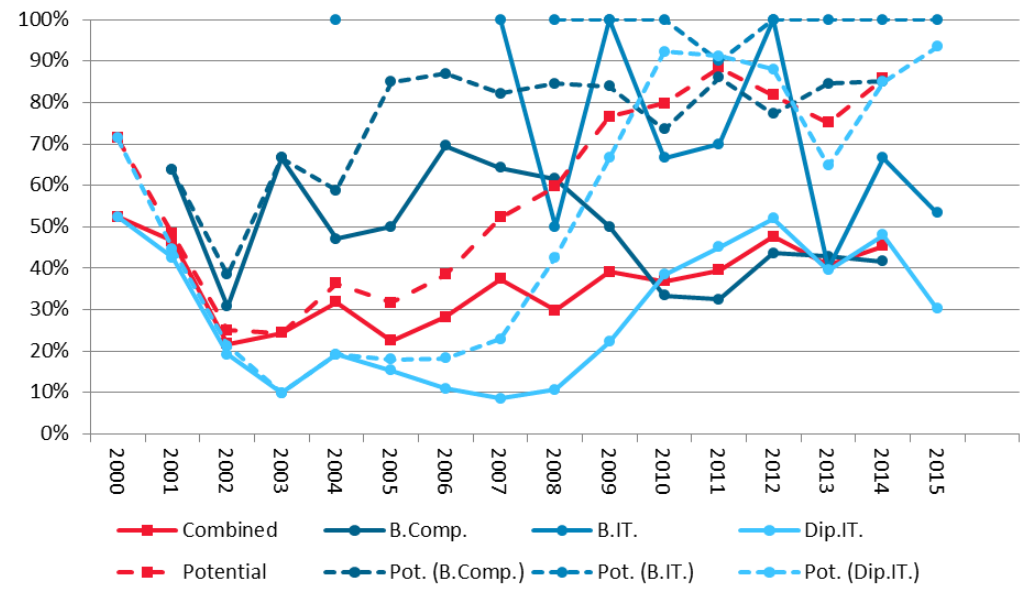
ENROLMENTS PER CAMPUS



ENROLMENTS PER QUALIFICATION

The enrolment numbers display healthy growth, which is expected to accelerate as the two newly-established campuses in Ekurhuleni and Nelson Mandela Bay grow in capacity over the next three years.

Success rates

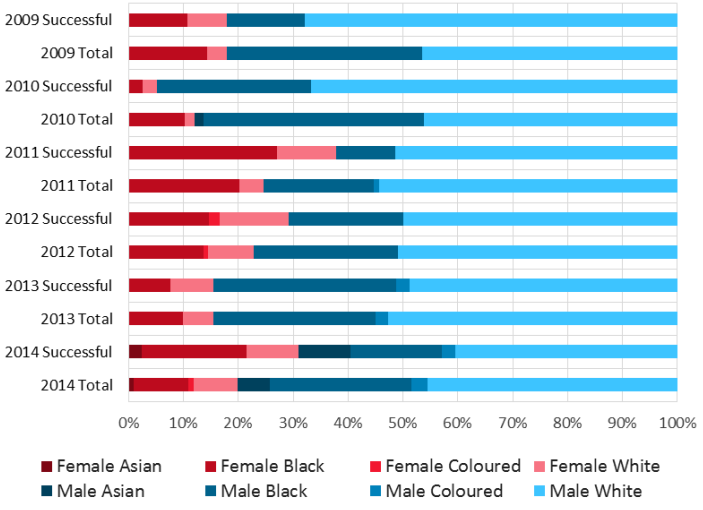


SUCCESS RATES PER COHORT

The later cohorts have not yet reached the maximum time available to complete their qualifications, so that the success rates for these cohorts may be expected to increase as students achieve success over periods exceeding the minimum time available.

Success rates per demographic group

These graphs illustrate the success rates of demographic groups by comparing the profiles of graduating classes with those of the corresponding entering classes. So, for example, TOTAL represents the students enrolled in a cohort, while SUCCESSFUL shows the students from that cohort that completed the qualification successfully.

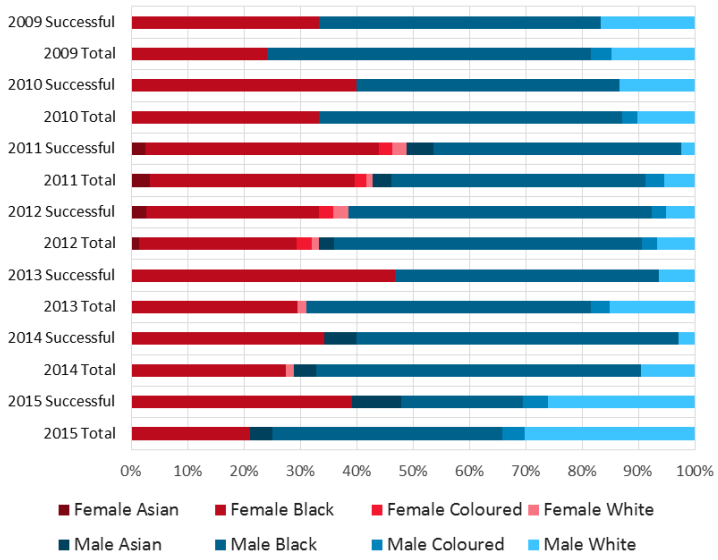


SUCCESS RATES PER DEMOGRAPHIC GROUP: BACHELOR OF COMPUTING

It is notable that, since 2011 at least, female students achieve relatively greater success than their male counterparts.

With the Diploma in Information Technology it is striking that white male students are less successful than students from other demographic groups. Here too, the female students outperform their male peers.

The Bachelor of Information Technology programme has not been offered long enough yet to be able to offer statistically significant data about it.



SUCCESS RATES PER DEMOGRAPHIC GROUP: DIPLOMA IN INFORMATION TECHNOLOGY

Chapter 13 Teaching and learning strategy

Teachers facilitate student learning. At a higher education institution this objective is accomplished through a formal approach to learning, including a course of study and lesson plan that teaches skills, knowledge and thinking skills. Different ways to teach are referred to as pedagogy. Teachers consider students' background knowledge, environment, and their learning objectives when deciding what teaching method to use. Teacher often assist in learning outside the classroom by accompanying students on field trips, guiding student projects and activities, and acting as mentor or coach outside the ambit of any individual course. Technology has begun to shape the way teachers approach their roles in the classroom.

Pedagogy can be thought of in two ways. First, teaching itself can happen in many different ways, leading to pedagogy of teaching styles. Second, the pedagogy of the students comes into play when a teacher assesses the diversity of their students and differentiates for the individual students accordingly.

Exemplary instruction

Belgium Campus envisions delivering exemplary education through optimal instruction. The achievement of this vision is pursued through several components, explicitly elaborated to ensure a shared vision.

VISION OF EXEMPLARY INSTRUCTION

The influence of David Merrill is acknowledged, resulting from the short, but seminal, paper[i] he and collaborators at Utah State University's Department of Instructional Technology published on the scientific approach to instructional design. The work, influenced by the educational theories of Robert Gagné[ii], strongly argues for a scientific approach to instruction as opposed to the vagaries of social approaches. Instruction is a science and instructional design is a technology founded in this science. The science-based technology of instructional design fulfils a crucial role in the larger context of education and social change.

Merrill states that many persons associated with educational technology today are engaged in a "*flight from science*". He argues that, instead, instruction is a scientific field and instructional design is a technology founded in this science. Instructional design is not merely philosophy or a set of procedures arrived at by collaboration. It is a set of scientific principles and a technology for implementing these principles in

the development of instructional experiences and environments. The structure of educational technology needs to abandon relativism and embrace science.

Enthusiasm

Teachers can affect how students perceive a course, so that teachers who show enthusiasm towards the course content and the students affect a positive learning experience towards the course. Teachers who have a positive disposition towards the course content tend to transfer their passion to receptive students. These teachers do not teach by rote, but attempt to find new invigoration for the course materials on a daily basis. Constantly finding innovative and enhanced ways to teach a course diminishes the tendency to feel bored with a course that is repeatedly presented. Boredom in a teacher will always transfer to boredom in the students!

Teachers that exhibit enthusiasm lead to students who are more likely to be engaged, interested, energetic, and curious about learning the subject matter. A correlation has been found[iii] between teacher enthusiasm and students' intrinsic motivation to learn and vitality in the classroom. Enthusiastic teachers are particularly good at creating beneficial relationships with their students. Their ability to create effective learning environments that foster student achievement depends on the relationship they build with their students. A teacher must guide their student in aligning their personal goals with their academic goals. Students who receive this positive influence show stronger self-confidence and greater personal and academic success than those without these teacher interactions.

The three most important aspects of teacher enthusiasm are enthusiasm about teaching, enthusiasm about the students, and enthusiasm about the subject matter. A teacher must enjoy teaching! A spark in the teacher creates a spark of excitement in the student as well.

An enthusiastic teacher has the ability, and the responsibility, to be very influential in the student's life. We accept this responsibility and exercise the ability in this spirit.

Effectiveness, efficiency and engagement

Instruction delivered by an enthusiastic teacher has the potential to be effective, efficient, and engaging.

- Effectiveness is the capability of producing a desired result. Effective instruction achieves its intended or expected outcome and produces a deep, vivid impression. It is successful, fruitful, potent and powerful. Effectiveness deals with reaching the objective of the instruction and is thus tightly coupled to the success of the students.
- Efficiency is the ability to avoid wasting resources, energy, effort and time in producing a desired result. Efficient instruction comprises the capability of producing a specific outcome with the optimal effort where all activities

support achieving the objective of the instruction. Efficiency deals with reaching the objective in the best possible way.

- Engagement occurs when students make a psychological investment in learning, are involved in their work, persist despite challenges and obstacles, and take visible delight in accomplishing their work. It involves a student's willingness and desire to participate in, and be successful in, the learning process promoting higher level thinking for enduring understanding. Engaging instruction must be appealing, attractive, arresting and satisfying.

Much instruction often falls short of its potential effectiveness, efficiency, and engagement. Too much instruction is information only ("Spray and pray and remember what I say"), meaning that the instructor presents information, hoping that the students will acquire some of it and then assesses this retention via remember tests. This tell and ask instruction is subject to significant forgetting, seldom prepares the student to apply the information to real world tasks, and often lacks any motivation for the students to acquire and use the information except to pass the test.

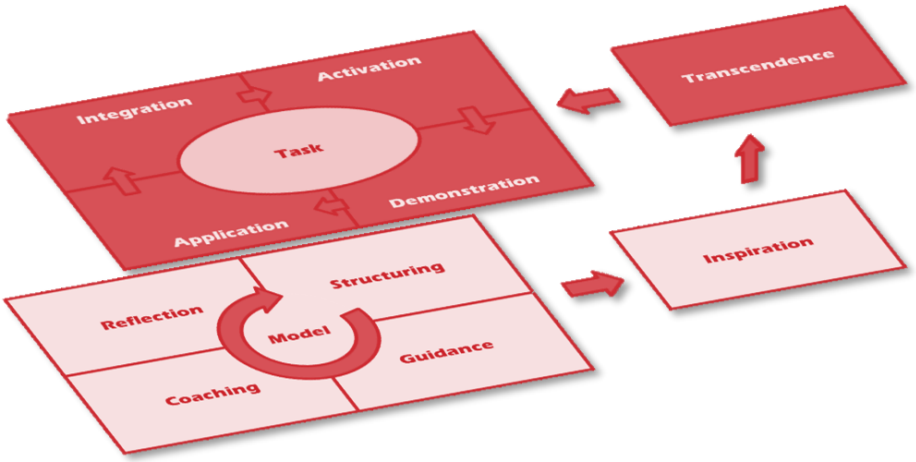
Students are motivated when they can see the relevance of what they are learning. They are much more likely to acquire, retain and be able to use the required skills if they learn new information in the context of real world problems, if they are shown a demonstration of skills they are expected to acquire (show), and if they have the opportunity to apply these skills in the solution of additional real world problems or the performance of additional real world tasks (do).

Merrill posited several theories that are valuable when pursuing effective, efficient and engaging instruction. His work is a response to the trend towards relativism and the reliance on technology to supposedly enable students to teach themselves, which he rejects. Teachers have the responsibility to teach and he supports this with scientific instructional theories that are founded on empirical research. Merrill's work on First Principles of Instruction[iv], Component Display Theory[v] and Instructional Transaction Theory[vi] are adopted and synthesised into and idealistic, yet pragmatic, strategy for instruction. Intellectual and emotional commitment are invested to create the best possible learning experiences and learning environments that will ensure learning that is effective, efficient, and engaging.

Level 6
Level 5
Level 4
Level 3
Level 2
Level 1
Level 0

An incremental strategy is followed for implementing the theories using a model adapted by Belgium Campus in an orderly, evolutionary fashion. This INSTRUCTIONAL STRATEGY SCALING approach, rather than a revolutionary big-bang approach, allows the gradual enhancement of instruction by adding principles and techniques sequentially. Once instruction is mastered and internalised in the instructional style of the teacher, the next level may be implemented by adding new strategy elements that build on those in the lower levels. As is evident in the accompanying graphic,

Belgium Campus does not aim merely to deliver five-star instruction – we set our sights one notch higher.

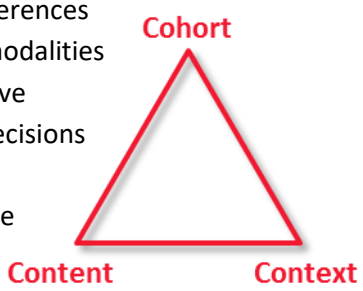


INSTRUCTIONAL MODEL

Embracivity

Instruction should be embracive of all models, theories and strategies that have the potential to enhance teaching and learning. Embracivity is used in the sense of being the opposite of exclusivity, so that it implies we should not rely on a single method of received wisdom, but explore all possibilities and integrate the utile methods into a coherent whole.

The previous section provides guidance for the pedagogy of teaching styles. For a comprehensive approach that also encompasses the pedagogy of the students, additional theories must be exploited to maximise instruction to a diverse student cohort by differentiating instruction based on student individuality. This is strongly indicated by Belgium Campus's core value of being a student-centred institution as a necessary component to achieving our mission.



Every student is an individual with unique, innate preferences with regard to cognitive preferences and perceptual modalities that define how that student naturally prefers to receive information (input), organise information and make decisions based on the information (processing), and produce information to the world (output). The students, as the receivers of instruction, are illustrated in the accompanying learning triangle as the cohort, the group of individuals who undergo a specific instance of instruction together. Of course, every teacher is an individual who has their own psychological profile due their own preferences. The instructor then, together with the characteristics of the learning environment, such as classroom venue and available instructional resources

such as learning materials and equipment, and instructional strategy employed, constitute the context in the learning triangle. The content represents what is to be learned as defined by the course objectives, learning outcomes and syllabus.

Each item from each of the three vertices is associated with cognitive and perceptual preferences. A student with a preference for introverted intuiting, for example, may prefer abstract, conceptual representations of information. A teacher may prefer to teach in a specific style suiting their own preferences. Similarly, specific component skills that need to be taught as part of the lesson plan may naturally tend to be presented or demonstrated in ways that favour certain preferences.

Instruction at the institution will embrace theories and tools that may enhance instruction. The first step is to cultivate awareness of individual differences. Several psychometric instruments have been developed and are listed in the appropriate index. Students should be encouraged to use the appropriate instruments so that the results may be used to fit instruction to their individual needs. Teachers should also use the instruments to gain insight into their own preferences and optimise their interaction with other individuals. The second essential step is to respect diversity. No specific preference is more, or less, valid than any other. They are simply different. Finally, these insights should be exploited. An instrument that measures cognitive preferences may be used to apply Jung's theories to the learning triangle. Incorporating information such as this, or the perceptual preferences of students, into the instructional strategy may be considered as supplementing the strategy with various tactics. Investigate all possible contributions critically, and embrace those that lead to enhanced instruction in the spirit of balancing idealism and pragmatism.

Excellence

Excellence describes a quality which is unusually good and so surpasses ordinary standards. Excellence is pursued through actions of integrity, being frontrunner in terms of products or services provided that are reliable, meeting all obligations and continuously learning and improving in all spheres[vii]. Aristotle referred to the concept of *133133ete* as an outstanding fitness for purpose which implies that excellence is achieved through the act of living up to one's full potential. The related concept of *eudaimonia*[viii] refers to the happiness which results from a life well-lived and fulfilled. The most important way to achieve excellent performance is to practice and the essential prerequisite is to possess the desire to strive for excellence in all things. Through excellence this institution distinguishes itself and its graduates as eminent and emulation-worthy.

The English expression "*Mind your Ps and Qs*" serves as a mnemonic for the attributes required to achieve instructional excellence. Professionalism certainly applies to us in our role as professional teachers and is also a strict requirement to fulfil this role. It

implies, in the first instance, elevated levels of knowledge and skill, both in the academic and technical content of our subject areas, and in the educational fields of pedagogy, instructional design and teaching. In addition, it implies strict codes of conduct enshrining rigorous ethical and moral obligations. This is non-negotiable when we consider that we are moulding the next generation of human beings; when we make a mistake, the company doesn't lose money, we disadvantage a young person's life.

This leads naturally to the supreme importance of pursuing quality in all our actions and deliverables. Quality is a measure of excellence as a state free from defects and deficiencies. It is brought about by strict and consistent commitment to defined standards that achieve a product, instruction and all the other artefacts of education, in order to satisfy requirements, forming graduates who are equipped with the knowledge and skills that make them sought after by employers. Quality does not occur spontaneously. The second law of thermodynamics shows that it necessary to constantly invest committed effort and directed energy in order to effect, and maintain, quality. Vision, dedication and purposeful strategies and processes are required to pursue and deliver quality.

Professionalism and quality are neither easy nor inexpensive to achieve. We are human beings and as a result will make mistakes. The distinguishing factor to achieve excellence is our constant striving to do our best and the desire to always learn more so that we may do better. It is expected that all teachers will adhere to all guidelines and policy statements affecting quality. Quality is a joint responsibility and all parties should actively scout opportunities for quality improvement.

We shall never be comfortable that we have reached a plateau that is "good enough", but shall strive to make each iteration at least a little better than the one before. Our conduct shall be impeccable and serve as example and inspiration to our colleagues and our students, to comport ourselves every day with an expectation of excellence.

6ε Instruction

SIX SIGMA (6σ) is a set of techniques and tools for process improvement developed by Motorola in 1986 and used in the business strategies of companies across many industrial sectors. The doctrine asserts the vital importance of continuous efforts to achieve stable and predictable results; that processes have characteristics that can be measured, analysed, controlled and improved; and that the achievement of sustained quality improvement requires commitment from the entire organisation. These statements resonate strongly with this institution's vision of delivering exemplary education through optimal instruction. Therefore by analogy, the institutional teaching and learning strategy has developed naturally into SIX EPSILON (6ε) Instruction. The reason is clear when considering that the preceding section in effect posed the question "How many

*E*s are there in instruction?" and 6ε thus represents the six attributes of instruction considered essential to fulfil our calling as teachers.

Empirically-proven scientifically-founded instructional theories yield the First Principles of Instruction to promote learning with corollaries that enhance the value of each principle. An instructional strategy that implements the first principles yields instruction that is ***effective***, ***efficient***, and ***engaging***. Such a strategy may be implemented incrementally to yield evolutionary improvement to increase the probability of adoption and success. Existing courses and courses in various phases of implementation of the strategy can be evaluated to measure the extent to which first principles have been implemented and to plan the next increment to incorporate.

An instructor must always be ***enthusiastic*** when undertaking instruction and infect their students with this enthusiasm. Getting excited about learning, clearly demonstrating the relevance and value of the course content, and empowering students to master the course outcomes are the major factors in motivating students to achieve their maximum potential. An ***embracive*** attitude must reign towards supporting and complementary theories and instruments that promote learning, with special mention of psychometric instruments and cognitive and perceptual theories that enable instructors to interact with students optimally to exploit their individual characteristics. Effecting congruence between the content, context, and cohort yields considerable benefit.

All activities of direct instruction, indirect instruction, student support and instructional administration should be undertaken so that they will be judged as ***excellent***. This requires permanent professionalism while being an accessible and approachable mentor and coach. The pursuit of quality is a way of life and quality should always be seen as something that will be even better the next time an event happens. Regular reflection and healthy criticism contribute to quality in an environment where excellence is nurtured and all stakeholders feel motivated and safe to implement improvement.

This proclaims the intent of the institution and all its members to pursue 6ε instruction vigorously and purposefully, to blazon this institution as the shining light that points the way for instruction and is the first choice for students who wish to excel.

Enhancing academics as teachers

While recognising the common use of the term lecturers to designate the faculty members at higher education institutions, note that the title of this section is in agreement with the first focus area for Phase 1 of the Institutional Audits Directorate's QUALITY ENHANCEMENT PROJECT[ix].

Teaching is a complex human action. The many tasks that are involved comprise four general components:

- Knowledge of the subject matter,
- Decisions about the purpose and nature of the learning experience,
- Interactions with students (through lectures, discussions, consultations, etc.), and
- Management of the entire instructional event.

The degree to which these tasks are performed well directly affects the quality of the learning experience that students have. Traditionally, higher education institutions are relied on to instil the needed subject matter mastery. Faculty development programmes commonly include efforts to improve communication strategies and the quality of interactions with students. Curriculum committees frequently control decisions about the purpose and nature of the learning experience.

The problem of designing and managing the instructional event is the responsibility of the faculty member, an area they may not be prepared for. At the same time, this area is probably the most crucial in determining whether or not students have a significant learning experience, rather than a boring or irrelevant one. To ensure that learning experiences are significant, it is necessary to understand how they are designed and to develop the skills to perform this task.

There are two general approaches to creating a course or any other form of instruction. The most common is the content-centred approach, sometimes called the "List of Topics" approach. The teacher compiles a list of important topics, often using the table of contents from one or more textbooks, decides how much time to assign to each topic, and how many test will be given. The advantage of this approach is that it is relatively easy and simple; the disadvantage is that it pays virtually no attention to the question of what students might learn beyond content knowledge, the type of learning most easily forgotten.

The alternative is to take a systematic, learning-centred approach to designing courses. The crux of this approach is to decide first what students can and should learn in relation to this subject and then figure out how such learning can be facilitated. Although this approach requires more time and effort, it also offers the best chance of ensuring that students have a significant learning experience. This represents education as Plutarch put it, "*the mind is not a vessel that needs filling, but wood that needs igniting*[x] ", not simply trying to fill the student with knowledge, but inspiring them to learn and experience the joy of learning.

Teaching models deal with the ways in which learning environments and instructional experiences are constructed, sequenced, and delivered. They provide theoretical or instructional frameworks, patterns and examples for any number of educational

components – curricula, teaching techniques, instructional groupings, classroom management plans, content development, sequencing, delivery, development of support materials, presentation methods, and discipline or student-population specific models. Models of teaching and learning are critical resources to instructional planning and delivery because help educators:

- Develop highly tuned and more varied professional repertoires,
- Allow them to reach larger number of students more effectively,
- Create either more uniform, or varied, or effective, instructional events, guided by targeted subjects, content or processes,
- Understand curricular foci better, especially as different models can be matched specifically to both learning outcomes and targeted learning populations,
- Gain needed insights into why some methods work with some learners, while others do not, and
- Radically modify or redesign existing methods of teaching and instructional delivery so that emerging or modified instructional techniques may better meet the needs of students.

It is important to develop a teaching toolkit containing a variety of different tools and techniques. No single technique fits all subject matter and different students have different perceptual and cognitive preferences. In any event, it is always wise to keep in mind that, no matter how meticulously a lesson was planned, "*no plan survives contact with the enemy*[xi] ".

Model elements are commonly used, often while ignorant of the source, like Howard Gardner's MULTIPLE INTELLIGENCES, Madeline Hunter's lock-step lesson formula for MASTERY LEARNING, Bernice McCarthy's LEARNING STYLES 4-MAT MODEL, KWL (know, want to know, learned), the GRAFFITI MODEL, SIX TRAITS WRITING, or the FISHBOWL DISCUSSION MODEL to formulate and deliver lessons. Models of teaching are represented by a broad array of teaching systems, each system containing a distinctive philosophical foundation, or theory of learning basis, with related pedagogical methodologies. Models are categorised into distinct families of educational psychology with distinctive theories of learning orientation to include constructivism.

Each family of models has strengths and weaknesses and there is great diversity in the available array of models. A preference for one set of models over another does not necessarily imply superiority or heightened utility. It often reflects alignment with the underlying beliefs of the educator using the model. There are no one-size-fits-all models of teaching and all models are not appropriate of all instructional scenarios. The primary power of learning about different teaching models lies in increasing the

diversity of personal teaching techniques. The more models teachers investigate and practice, the more techniques they have at their disposal and the better their chances at optimising efforts to successfully reach and teach their students.

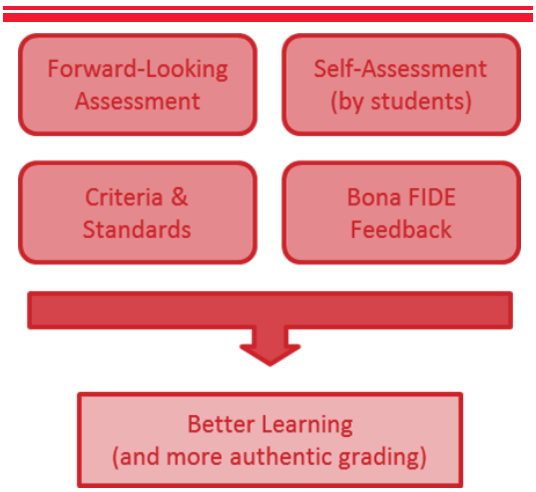
This institution will embrace theories, tools or techniques that promote the efficacy of teaching and learning. The dual guiding principles of the strategy are:

- ***Idealism***: The institution shall continuously strive to improve the quality of teaching and learning. Theories, tools and techniques shall be investigated and implemented with a holistic philosophy, so that the entirety of teaching and learning forms a seamless unit.
- ***Pragmatism***: The implementation of any theory, tool or technique will be measured and evaluated. Artefacts which do not yield positive results will be abandoned, regardless of whether Plato said so or Jung said so or Bloom said so. Any implementation should be adapted and customised to extract maximum utility, even when this contradicts received wisdom, if the reality disproves convention.

All members of the faculty are encouraged to research available artefacts, discuss and weigh options, implement such artefacts using scientific principles, determine the value they yield, and disseminate findings among colleagues through discussion, presentations and documented guides. Such endeavours articulate perfectly with the vision and mission of the institution.

Feedback and assessment

A learning-centred course calls for a sophisticated approach to the design of feedback and assessment to enhance the quality of student learning. The following principles are applied to continuous formative assessment to achieve better learning and more authentic grading. Continuous assessment and authentic feedback thus form integral components of the teaching and learning strategy.



FEEDBACK AND ASSESSMENT STRATEGY

Forward-looking assessment incorporates exercises, questions, and problems that create a real-life context for a given issue, problem, or decision to be addressed. To construct this kind of question or problem, the instructor has to look forward, beyond the time when the course is over, and ask in what kind of situation they expect students to need, or be able to use, this knowledge. Answering this

question makes it easier to create a question or problem that replicates a real-life context. The problem should be relatively open-ended and not totally pre-structured. If necessary, certain assumptions or constraints can be given in order to be able to assess the quality of student responses.

An example in which students have studied design techniques illustrates the difference between a backward- and forward-looking assessment. A backward-looking assessment would ask students about differences in the steps and outputs of the design techniques. In a forward-looking assessment, students might be asked to imagine that they are working for a consulting company that has to perform a design project for a client. The consultant has to consider the client's requirements and choose a design strategy that will provide the models that addresses the client's needs and answers the burning questions. Such a question requires that students imagine a situation where they could actually use what they have learned.

It is important to explain clearly the ***criteria and standards*** that will be used to assess student work. Instructors need to determine and share with students what the general traits or characteristics are of high quality work in this area. These are the criteria for evaluation. On each of these criteria, it must be determined how good the work has to be in order to be acceptably good or exceptionally good. These are the standards that are established to define work that is acceptable, good, or exceptional.

It is also important for instructors to create opportunities for students to engage in ***self-assessment***. Later in life, students will need to assess their own performance. They should start learning how to do that while in the course. Initially, these may be done in groups. After some practice, they should be done individually. During the process, students need to discuss and develop appropriate criteria for evaluating and assessing their own work.

As the students seek to learn how to perform well, instructors need to provide feedback. High-quality feedback that will be valuable to the students has the characteristics of ***bona FIDE feedback***:

- **Frequent**: Give feedback as frequently as possible, daily if possible, but at least weekly.
- **Immediate**: Get feedback to students as soon as possible.
- **Discriminating**: Make clear what the difference is between poor, acceptable, and exceptional work.
- **Empathic**: Be empathic and sensitive when delivering feedback.

The following principles of formative feedback enhance the quality of the feedback and, as a result, improve learning:

1. *Facilitate* the development of *self-assessment* (reflection) in learning.
    - When students hand in work, ask them what kinds of feedback they would like.
2. *Encourage instructor and peer dialogue* around learning.
    - Use one-minute papers about learning, assignments, and feedback.
    - Ask students to identify examples of feedback comments they found particularly helpful.
3. Help *clarify what good performance is* – the objectives, criteria, and standards expected.
    - Provide better definitions of requirements using carefully constructed criteria sheets and performance level definitions.
4. *Provide opportunities to close the gap* between current and desired performance.
    - Increase the number of opportunities for resubmission of work.
5. *Deliver high-quality feedback information* to students about their learning.
    - Relate feedback to predefined criteria.
    - Provide feedback soon after a submission.
    - Provide corrective advice, not just information on strengths and weaknesses.
6. *Encourage positive motivational beliefs and self-esteem*.
    - Provide opportunities for low-stakes tasks with feedback before giving a high-stakes task with grades.
    - Provide grades on written work only after students have responded to feedback comments.
7. Provide information to instructors that can be used to help shape the learning, in other words *use feedback to improve teaching*.
    - Have students identify where they are having difficulties when they hand in assessed work.
    - Use anonymous one-minute papers at the end of a class session.

Formative assessment and feedback processes can help students take control on their own learning to become self-regulated students. Students already assess their own work and generate their own feedback when they reflect on their performance and higher education should build on this ability.

The focus is shifted so that students are seen as having a proactive rather than a reactive role in generating and using feedback. This has profound implications for way in which instructors organise assessments and support learning.

References

Teaching and learning artefacts

Artefacts used to manage teaching and learning are available for inspection.

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[viii] Aristotle (2004). *ibid*.
[ix] Council on Higher Education, (2014). FRAMEWORK FOR INSTITUTIONAL QUALITY ENHANCEMENT IN THE SECOND PERIOD OF QUALITY ASSURANCE. Pretoria: Council on Higher Education, p. 20.
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[xi] Moltke, H.K.B., Graf von (1880). MILITARY WORKS, VOL. 2. In: Hughes, D.J. (ed.) (1993). MOLTKE ON THE ART OF WAR: SELECTED WRITINGS. New York: Presidio Press.

Appendix D National education and training statistics

Data for the school sector supplied as per DBE[i]; for the post-school sector as per DHET[ii].[1]

Schools

Province		Schools	Educators	Learners
Eastern Cape 	Public	5 469	58 372	1 898 723
	Independent	207	3 257	62 824
		5 676	**61 629**	**1 961 547**
Free State 	Public	1 214	22 465	671 712
	Independent	68	1 058	16 637
		1 282	**23 523**	**688 349**
Gauteng 	Public	2 083	63 092	2 048 558
	Independent	730	18 986	278 026
		2 813	**82 078**	**2 326 584**
KwaZulu-Natal 	Public	5 895	84 810	2 808 137
	Independent	247	4 989	69 407
		6 142	**89 799**	**2 877 544**
Limpopo 	Public	3 867	51 650	1 706 725
	Independent	151	2 768	58 830
		4 018	**54 418**	**1 765 555**
Mpumalanga 	Public	1 725	34 034	1 046 234
	Independent	122	370	28 118
		1 847	**34 404**	**1 074 352**
Northern Cape 	Public	545	8 841	287 435
	Independent	30	295	4 080
		574	**9 136**	**291 515**
North West 	Public	1 471	24 876	811 340
	Independent	63	1 232	19 207
		1 535	**26 108**	**830 547**
Western Cape 	Public	1 450	33 254	1 063 349
	Independent	237	4 264	53 223
		1 687	**37 518**	**1 116 572**
South Africa 	Public	23 719	381 394	12 342 213
	Independent	1 855	37 219	590 352
		25 574	**418 613**	**12 932 565**

DATA FOR ORDINARY SCHOOLS, 2016

Note: Does not include data on Special Needs Education (SNE) schools.

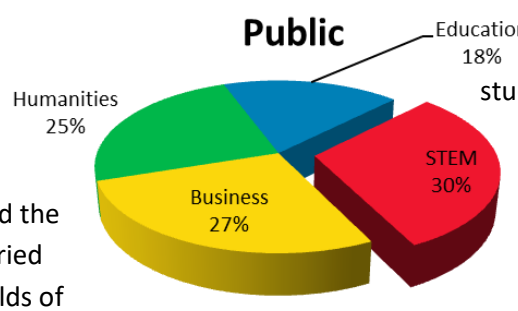
[1] Calculation errors in both these sources were corrected for presentation here.

Higher education institutions

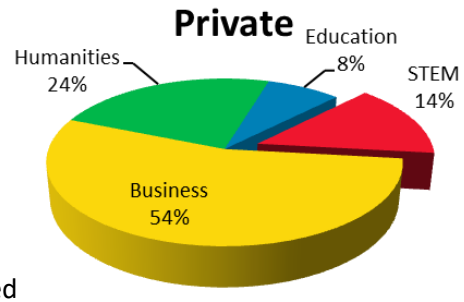
Enrolments

	Public	Private	Total
STEM	295 383	23 925	319 308
Business and management	264 934	91 009	355 943
Humanities	238 535	39 392	277 927
Education	176 985	13 082	190 067
	975 837	**167 408**	**1 143 245**
Certificates and diplomas	254 990	85 647	340 637
Undergraduate degrees	530 361	65 509	595 870
Postgraduate below master	91 866	7 913	99 779
Master degrees	57 290	7 972	65 262
Doctoral degrees	21 510	367	21 877
Occasional students	19 820		19 820
	975 837	**167 408**	**1 143 245**

HEI ENROLMENTS, 2016



The accompanying graphs show the differences in fields of study that students enrol for in public and private HEIs. It is clear that fields like the natural sciences and the varied fields of engineering remain centred in the public sector.



This may be attributed to the massive capital expenditure required to establish the required infrastructure for laboratories and research facilities that are necessitated for these fields.

Instead, private institutions are focused in the main on the fields of business and management studies.

The preceding table also shows that private institutions are in the main directing their efforts at delivering qualifications at an undergraduate level. The distribution of students at PHEIs among fields of study and qualification type and level reflect the opportunities available, i.e. what the PHEIs are able and willing to offer.

These facts are also clear if we consider the mix of qualifications offered by private higher education institutions[iii], as elaborated in the following table.

NQF level	5	6			7			8			9		10		
Qualification type	HCert	AdvCert	Dip-240	Dip-360	AdvDip	B-360	B-480	BHons	PGDip	Master	Doctor				
Field															
Commerce															**368**
Business/Management	70	16	14	31	8	46	1	14	19	15	4	**238**			
Financial services	12	4	1	1		3			3			**24**			
Human resources	6		2	6		4		1				**19**			
Marketing	18	2	7	22	2	23	1	8	2	2		**87**			
Science															**105**
Engineering/Science	1		1		1	3	2			1		**9**			
ICT	18	4	15	20		15	1	2		1		**76**			
Nursing	4		5	5	5				1			**20**			
Humanities															**160**
Counselling	6	2	2	1		9	1	3	3	2		**29**			
Education	6	1	2	6	6	8		1	3			**33**			
Law	7			3	1	6	1		1			**19**			
Philosophy	1	1				2		1		3	1	**9**			
Theology	20		5	6		22	6	6		3	2	**70**			
Arts															**107**
Film/TV production	5		1	3	1	6		1		1		**18**			
Media/Fine arts	17	8	5	20	2	20	1	4		1		**78**			
Performing arts	1	1		4	1	2	1	1				**11**			
Aesthetics/Services															**130**
Fashion/Interior design	12	1	3	9	2	9		4				**40**			
Health/Beauty	9	12	13	7	5							**46**			
Hospitality/Tourism	12	3	9	14	3	3						**44**			
	225	**55**	**85**	**158**	**37**	**181**	**15**	**46**	**32**	**29**	**7**				
	225		**298**		**218**		**93**			**29**		**7**			870

PHEI QUALIFICATIONS

Note that 60% of the qualifications offered by PHEIs are pegged at NQF levels 5 and 6. Comparing the earlier enrolment numbers for PHEIs shows that 51% of students at these institutions were enrolled for these qualifications. Thus, while there are fewer qualifications offered at NQF level 7 or higher, a larger percentage of students elect to enrol for these degrees and postgraduate qualifications.

It is of note that the total number of qualifications (870) may be expected to decrease by 2023 as qualifications not aligned with the HEQSF are taught out to current cohorts only, while new cohorts enrol for replacement programmes introduced since 2010.

Staffing

	Public	Private	Total
Academic and research	19 214	8 188	27 402
Admin and support	29 853	4 931	34 784
Services	8 317	1 675	9 992
	57 384	**14 794**	**72 178**

HEI STAFFING, 2016

The preceding section on basic education showed that public schools had 32.4 learners per educator, while independent schools had only 15.9 learners per educator. As seen above, in the higher education sector, public universities serve

50.8 students per academic and private institutions have 20.4 students per academic. In both the basic and higher education sectors, there is a marked difference in the ratio of teachers available to serve their students, with private institutions investing in more teachers to decrease class sizes and deliver individual attention to students. It is posited that this factor may contribute to the relative success rates of public and private institutions.

Graduates

	Public	Private	Total
STEM	59 125		
Business and management	56 364	Data not available	
Humanities	45 480		
Education	42 107		
	203 076		
Certificates and diplomas	53 289	21 277	74 566
Undergraduate degrees	93 915	12 910	106 825
Postgraduate below master	40 213	3 246	43 459
Master degrees	12 862	2 184	15 046
Doctoral degrees	2 797	69	2 866
	203 076	**39 686**	**242 762**

HEI GRADUATES, 2016

In the absence of detailed cohort data, an imperfect, but consistent, evaluation of student performance may be obtained using the ratio of graduates produced in 2016 to the enrolment headcounts for 2016. This yields ratios of 20.8% and 23.7% for public and private HEIs, respectively, indicating slightly better performance by private institutions.[2]

Colleges

Community colleges

AET Levels 1 to 3	60 448
AET Level 4	122 619
Grades 10 and 11	1 633
Grade 12	85 625
Occupational programmes	3 106
	273 431

ENROLMENTS IN CET COLLEGES, 2016

[2] It is acknowledged that these numbers probably underestimate actual success rates due to increasing enrolment numbers, but the data used here are consistently (mis)applied.

TVET colleges

	Public	Private	Total
National cert (vocational)			
NC(V) level 2	89 174		
NC(V) level 3	52 108		
NC(V) level 4	35 979		
	177 261	**2 857**	**180 118**
Report 191 programmes			
N1 to N3	162 290	39 401	201 691
N4 to N6	329 736	33 256	362 992
	492 026	**72 657**	**564 683**
Occupational programmes	13 642	32 279	45 921
Report 550/NSC		5 389	5 389
Skills dev. & short courses	22 468	55 729	78 197
Total	**705 397**	**168 911**	**874 308**

ENROLMENTS IN TVET COLLEGES, 2016

SETA-supported learning providers

Learnerships	101 447
Internships	17 216
Skills programmes	131 017
	249 680

ENROLMENTS IN SETA-SUPPORTED LEARNING PROGRAMMES, 2016

Students with disabilities

Public HEIs	7 525
Private HEIs	Data not available
Public TVET colleges	2 639
CET colleges	2 380
Private colleges	1 546
	14 090

ENROLMENTS OF STUDENTS WITH DISABILITIES, 2016

These data demonstrate the paucity of opportunities for individuals with special needs in the post-school sector.

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Appendix E NVAO review standards

Framework for institutional reviews

Standard 1: Vision and policy

The institution's vision of higher education and its quality, the policy it pursues with regard to education and the policy it pursues with regard to research and social and academic services in relation to the quality of education, offer an adequate response to the social challenges.

Criteria

The institution has a broadly supported vision of education and a corresponding policy. The policy comprises, as a minimum: policy regarding education, as well as research and social and academic services in relation to education.

The institution has a vision of higher education and the quality of its programmes in relation to the social challenges of its environment. The connections may be fleshed out at the regional, national, European or international level. To realise its vision, the institution has formulated an adequate policy. One of the key focal points of this policy is providing students with the qualifications necessary to meet the challenges of civil society.

It is essential for all those involved to play an active role in the establishment of the vision and policy; this characterises a quality culture.

Standard 2: Policy implementation

The institution has adequate policy measures, processes, procedures, practices and instruments at its disposal to realise its policy in an effective manner, and to optimise the quality of the programmes offered.

Criteria

The institution pursues its education policy in an adequate manner, using policy measures, processes, procedures, practices and instruments, among other ways.

Adequate policy implementation presupposes concrete objectives ensuing from the vision and allocation of sufficient resources to implement the policy. The institution explains what policy measures, processes, procedures, practices and instruments it uses and why it deems those most efficient and effective. The quality culture in place is demonstrated by the participation, the process, the results and the manner in which the instruments are deployed.

Standard 3: Evaluation and monitoring

The institution guarantees the effectiveness of its policy implementation for the benefit of the quality of education by setting up feedback and monitoring systems and, in particular, internal quality monitoring systems.

Criteria

The institution gauges and evaluates the effectiveness of its policy implementation on a regular basis in order to guarantee the quality of the education it provides. To this end, it has an adequate quality assurance system in place.

In order to be able to guarantee the effectiveness of its policy, the institution must have insight into the extent to which its vision of education is realised under the policy it pursues. To this end, it has a proper evaluation and monitoring system in place. This system provides the institution with aggregated information. This information pertains to all relevant policy domains, including any procedures and instruments the institution deploys to realise its policy objectives and guarantee the quality of education.

The system of regular internal evaluations and external assessments ties in with the management model pursued. Institution-wide uniformity in the evaluation and gauging activities is not required.

An active role by students, staff, alumni, external and independent experts from the disciplines and the professional field is essential in a quality assurance system, and bolsters the further development of a quality culture.

Standard 4: Enhancement policy

The institution takes measures to improve the realisation of its policy objectives.

Criteria

The institution can demonstrate that it is systematically improving its education policy wherever necessary.

The institution pursues an active improvement policy based on the outcomes of its measuring and assessment activities. Among other things, it demonstrates its ability to innovate and adapt in order to improve the education it provides. The improvement policy pursued by the institution results in a quality culture, in which all those involved contribute to innovation, and to quality improvement.

Programme accreditation framework

Standard 1: Intended exit level

The determination of the intended exit level of the programme is based on the manner in which the level descriptors have been translated into programme-specific learning outcomes that meet the international requirements with respect to content, level and orientation.

Criteria

As for level and orientation (bachelor's or master's; professional or academic), the intended programme-specific learning outcomes fit into the Flemish qualifications framework and, if available, relevant domain-specific learning outcomes. They tie in with the international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme.

Standard 2: Teaching-learning environment

The teaching-learning environment enables the students to achieve the intended learning outcomes.

Criteria

The content and the design of the programme, including the programme-specific teaching and learning formats, the staff deployed and the facilities enable the admitted students to achieve the intended learning outcomes. Curriculum, staff and facilities form a cohesive teaching-learning environment for the students.

Standard 3: Exit level to be achieved

The programme has an adequate assessment, testing and examination system in place and demonstrates that the intended learning outcomes are being achieved.

Criteria

The level realised is apparent, on the one hand, from the validity, reliability and transparency of the assessment, and on the other, from the results of the testing and examination of the students, and the job prospects for graduates or their opportunities for transferring to subsequent study programmes.

Standard 4: Set-up and organisation of the internal quality assurance

The set-up and the organisation of the internal quality assurance are aimed at systematically improving the programme with the involvement of the relevant stakeholders.

Criteria

The programme is periodically evaluated, based in part on testable objectives. The outcomes of this evaluation form the basis for verifiable measures for improvement that contribute to the realisation of the objectives. Staff, students, alumni and the relevant (professional) field of the programme are actively involved in the internal quality assurance.

Critical reflection

This document is the product of Belgium Campus iTversity's critical self-reflection on the state of the institution and its academic programmes. The first part of the document (yellow borders) contains the narrative that presents and critiques the state of the institution.

The two contextual chapters (CHAPTER 1 and CHAPTER 2) may be omitted by reviewers who do not require background on the South African milieu and educational system. The core of the discussion resides in CHAPTER 3, CHAPTER 4, CHAPTER 5 and CHAPTER 6. This discussion is bookended by CHAPTER 0 and CHAPTER 7.

The second part of the document (**red** borders) contains additional discussion on selected aspects of Belgium Campus iTversity. Of note here is CHAPTER 8, which discusses the BACHELOR OF COMPUTING programme which is under review in addition to the institutional review.

Administrative data for the institution may be found in APPENDIX A.

Supporting evidence

The work of André J. Welgemoed, who compiled a mapping of NVAO criteria to supporting evidence that may be considered, is gratefully acknowledged. The information accompanies this document as an attachment.

References

Supporting evidence for criteria

A mapping criteria to artefacts utile as evidence may be found in file SUPPORTING EVIDENCE.ZIP.

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