Bothlale Village

Working together for ICT Innovation and Growth in Africa

An Incubation and Innovation Village – Belgium Campus

Participative Regional Development Strategy

Overview

Abstract

South Africa is at a crossroads. On the one hand, South Africa finds itself in a leading position on the continent with the 2nd largest and most advanced economy – confirmed by its joining of the emerging countries group BRICS in 2010. On the other hand, stagnating economic growth combined with high unemployment rates and socio-economic inequality form serious challenges. Meanwhile, several donor partners are in the process of leaving the middle-income country due to budget constraints and increased focus on least-developed and fragile states. One of the biggest challenges facing South Africa today is that of high unemployment. Adult unemployment rate is reported to be 25%[1], while youth unemployment rate is reported to be as high as 65%.[2] This is partially due to the human capital gap between a large demand for high-skilled workers and an oversupply of unskilled workers. In addition, South Africa is subject to a volatile but persistent process of the so-called brain drain of high skilled citizens as well as a decline in foreign and domestic investment due to legislative policies and overall investment uncertainty. South Africa needs the next step forward – to ensure adequate living conditions for all its citizens and to take up its leading role of fostering broad regional development.

The Incubation and Innovation Village at the Belgium Campus holds the capacity to help unleash South Africa's leading potential. Fully aware of South Africa's suboptimal situation, Belgium Campus operates a model that distinguishes underlying causes from opportunities as it integrates Education4Development and ICT4Development (ICT4D) in its Participative Regional Development Strategy Model. By upholding continuous linkages between government, business, academia and society, this demand-driven model sees its added value in the creation of jobs, sustainable enterprises, economic growth and regional development. This unique model is capable of adhering to regional and national development strategies and of being implemented in the larger Sub-Saharan region in the areas of private sector development, education, research and innovation.

[1] Organisation for Economic Cooperation and Development, *Employment Outlook South Africa*, 2015. (OECD: http://www.oecd.org/southafrica/Employment-Outlook-SouthAfrica-EN.pdf).

[2] The African Development Bank Group, *South Africa,* 2015. (AFDB: http://www.afdb.org/en/countries/southern-africa/south-africa/).

ICT4D and the International Development Agenda

In the context of the multilateral discussions of the post-2015 International Development Agenda, Information and Communication Technology (ICT) was identified as one of the priority areas in response to the global ICT revolution and the needs of the upcoming knowledge society. The importance of integrating ICT into development cooperation is increasingly being acknowledged by the broad international community, following growing evidence of its positive impact on economic growth and poverty reduction. For instance, the Development Assistant Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD) wishes to view ICT as a multidimensional factor in pro-poor growth, private sector development, service delivery and the achievement of the UN Millennium and Sustainable Development Goals. Since the 2000s, the integration of ICT as a means of achieving development goals is clearly taking place at all levels of development cooperation - multilateral, national, regional and local. The Millennium Development Goals (MDGs)[3] for 2015 explicitly recognised the role of ICT in development and four out of the seventeen Post-2015 Sustainable Development Goals (SDGs)[4] make reference to the role of ICT. National development agencies have been establishing in-house specialist and departments on ICT4D. Donors are increasingly funding ICT4D-pilot projects in various sectors and countries. The World Summit on the Information Society (WSIS) – the main multilateral platform promoting ICT4D – works to coordinate efforts to enable ICT in development, supported in its efforts by the United Nations Group on the Information Society. In addition, the G8 Digital Opportunity Task Force and the UN ICT Task Force also actively advocate the bringing of ICT to the forefront of development.

As ICT is adapting continuously and at a rapid pace, the need to leverage ICT as an effective tool towards poverty alleviation is ever pressing. In order for ICT to become an effective and progressive tool, national ICT sectors and staff need to be fully developed, resourced, up to date and regionally integrated. This need is also acknowledged by the Southern African Development Community (SADC) who wish to bridge the digital divide between the region and the rest of the world as it states that: "international experience has shown that ICT, if harnessed, can contribute significantly to the economic development of countries and facilitate the provision of a better life for citizens". Noteworthy are the priority areas of action, as identified by the SADC for its regional policy strategy[5]:

1. *Community Participation in ICT Development* "to enable all to participate in the global knowledge society as equal partners".

[3] United Nations (UN), *United Nations Millennium Development Goals*, 2000. (UN: http://www.un.org/millenniumgoals/bkgd.shtml).
[4] United Nations (UN), *Sustainable Development Goals Proposal*, 2015. (UN: https://sustainabledevelopment.un.org/sdgsproposal).
[5] Southern African Development Community, *Declaration on Information and Communication Technology,* 2001. (SADC: http://www.sadc.int/files/7813/5292/8380/Declaration_on_Information_and_Communication_Technology2001.pdf).

2. *ICT in Business Development* "to adopt and adapt technologies that enable e-commerce capability to avoid increasing exclusion from the global economy".
3. *Human Resource Capacity for ICT development* "since the effective use of ICT presumes a literate population".

In its intent to contribute to regional development, Belgium Campus acknowledges SADC's priority actions but also goes beyond them. Recognising ICT's cross-cutting nature and applicability, Belgium Campus wishes to expand SADC's definition from "e-commerce" to ICT in different sectors, across disciplines and a wide-range of applications. In addition, Belgium Campus places its focus on advanced human capital development so that the Innovation Village's projects and enterprises are able to develop appropriate ICT-embedded applications that are transparent, intuitive and straightforward to use by target audiences.

Rising up to opportunity: ICT, South Africa and Africa

Embarking on ICT4D in achieving the Sustainable Development Goals becomes all the more relevant considering the fact that Africa is significantly and rapidly taking part in the global ICT revolution. In 2000, there were only 15 million mobile subscriptions across Africa, while the figure amounted to 500 million subscriptions by 2010.[6] Today, Africa has approximately 910 million subscriptions[7] - exceptionally remarkable for a continent with a population of over 1 billion people. Likewise, ICT is becoming increasingly important in the everyday life of South Africans. According to Research ICT Africa (RIA), the relatively sophisticated and dynamic ICT sector in South Africa amounted to approximately 6% of national GDP in 2012 and continues to grow.[8] Moreover, South Africa's well-developed tertiary sector – a sector heavily dependent on the use of ICT - accounted for 69% of national GDP in 2012.[9] Besides business and industry, the people of South Africa are also catching up: 1 per 100 people had mobile subscriptions in 1994, rising to 150 per 100 people in 2014. Considering that a high-income country like Belgium evolved from 1 per 100 people in 1994 to only 114 per 100 people, the prominence of mobile services in the lives of South Africans is evident.[10] The use of data services is also gaining relevance: data use is increasingly preferred over airtime and SMS services are almost entirely taken over by free instant-messaging services.[11]

However, South Africa has not consolidated its ICT growth and mainstreaming processes just yet. The use of ICT is skewed: "South Africa is characterized by early adoption of leading-edge technologies by high income users (both individuals and corporations) in parallel with developed economies, while the majority of the population, the public sector and small enterprises reflect the slower adoption patterns typical of developing countries".[12] Furthermore, the policy environment in South Africa is not sufficiently conducive to investment or effective competition – hindering expansion of the sector and dynamic responses to the changing nature of ICT. Affordable access to the full range of ICT services remains insufficient with prices remaining high by African and global standards. Whereas

[6] Claude Harding, *How Africa's economy is benefitting from the ICT revolution, 2011. (Maritz Africa: http://www.howwemadeitinafrica.com/how-africa's-economy-is-benefitting-from-the-ict-revolution/12857/).*

[7] Ericcson, *Ericsson Mobility Report*, June 2015. *(Ericcson:* http://www.ericsson.com/res/docs/2015/ericsson-mobility-report-june-2015.pdf).

[8] Research ICT Africa (RIA), Policy Paper 7, *Understanding what is happening in CIT in South Africa: a supply- and demand side analysis of the ICT-sector*, 2012. (RIA: http://www.researchictafrica.net/publications.php).

[9] Industrial Development Cooperation, *Overview of key trends in South Africa economy since 1994*, 2013. (IDC: http://www.idc.co.za/reports/IDC%20R&I%20publication%20%20Overview%20of%20key%20trends%20in%20SA%20economy%20since%201994.pdf).

[10] The World Bank Group, WDI-database: Mobile subscriptions per 100 people, 2015. (WB: http://data.worldbank.org/indicator/IT.CEL.SETS.P2/countries?display=default).

[11] Research ICT Africa (RIA), Policy Paper 7, *Understanding what is happening in CIT in South Africa: a supply- and demand side analysis of the ICT-sector*, 2012. (RIA: http://www.researchictafrica.net/publications.php).

[12] Research ICT Africa (RIA), Policy Paper 7, *Understanding what is happening in CIT in South Africa: a supply- and demand side analysis of the ICT-sector*, 2012. (RIA: http://www.researchictafrica.net/publications.php).

86% of the adult population has individual mobile phone ownership, only 18% of households have fixed-line access – due to high instalment costs for providers and the availability of viable alternatives. Although mobile service prices have been decreasing, "the cheapest mobile prepaid product in South Africa is still nearly 7.5 times more expensive than the African continent's cheapest similar product".[13] High broadband pricing remains a barrier to the exponential growth required for South Africa to catch up to the rest of the world and for enterprises who are bound to broadband for stable connectivity, according to RIA. In this sense, stable high-speed broadband represents a "high input cost for South African enterprises with negative consequences for their growth, development and global competitiveness". Finally, despite South Africa's advanced and emerging economy status leading to obvious advantages over other African nations – South Africa is not the top performer on the African continent. With respect to internet and voice connectivity, South Africa was ranked 90th on the ITU ICT Development Index in 2010 (whereas it was ranked 72nd in 2002) – leaving Mauritius, Seychelles, Tunisia, Morocco and Egypt ahead.[14] The World Economic Forum Network Readiness Index (NRI)[15] of 2013 ranked South Africa 70th in the world – well above African countries included in the study but lagging behind similarly-sized economies (such as Turkey, Poland, Chile) and fellow BRICS members.[16]

In the National Development Plan for 2030, the National Planning Commission formulated the short term goal (2012 to 2015) of performing a full policy review in order to "develop a more comprehensive and integrated e-strategy that reflects the cross-cutting nature of ICTs".[17] As a medium term target (2015 to 2020) the NPC sets to achieve 100% broadband penetration by 2020 and for the long term target (2020 to 2030) to make "extensive use of ICTS in delivery of services to citizens, including entertainment, information and education" – clearly adhering to the international call for ICT4D. In addition, as critical to the success of its ICT-strategy, the NPC suggests greater collaboration between the state, industry and academia as it views the ICT sector as a critical economic infrastructure. Finally, the Department of Science and Technology (DST) recognises the need for increased investment in ICT R&D in order to reap the socioeconomic benefits of ICT since

[13] Research ICT Africa (RIA), Policy Paper 7, *Understanding what is happening in CIT in South Africa: a supply- and demand side analysis of the ICT-sector*, 2012. (RIA: http://www.researchictafrica.net/publications.php).
[14] Research ICT Africa (RIA), Policy Paper 7, *Understanding what is happening in CIT in South Africa: a supply- and demand side analysis of the ICT-sector*, 2012. (RIA: http://www.researchictafrica.net/publications.php).
[15] The Network Readiness Index (NRI) measures the propensity of countries to exploit opportunities offered by ICT and the impact of ICT on the competitiveness of nations.
[16] Research ICT Africa (RIA), Policy Paper 7, *Understanding what is happening in CIT in South Africa: a supply- and demand side analysis of the ICT-sector*, 2012. (RIA: http://www.researchictafrica.net/publications.php).
[17] NATIONAL PLANNING COMMISSION, *National Development Plan: Vision for 2030,* 11.11.2011, p. 176.

currently the ICT R&D sector currently suffers from underinvestment (whereas the figure was 0.12% in 2009, it decreased to 0.065% in 2013).[18]

South Africa needs to rise up to the occasion and continue to take part in the global ICT revolution, especially as ICT gains relevance on the international development stage. In addition, the rapidly changing nature of ICT and the size of its role in the South African economy calls for action. These circumstances offer a window of opportunity which Belgium Campus grasps by contributing to the mainstreaming of ICT through the provision of ICT studies as well as by integrating ICT4D in its Innovation Village research model. In this way, Belgium Campus acknowledges the targets goals of the NDP by already embarking on efforts to contribute to the long term target for 2020 to 2030. In addition, as an institute of higher learning, Belgium Campus rests its foundational pillars on innovative research, world-class-standard education and serving the regional community in which it operates. Subsequently, all research and education activities are aligned with the goal of improving the lives of community members in the region in a pro-active way that identifies challenges and opportunities – through continuous engagement with all stakeholders. By carrying out education and research activities through the use of ICT in innovative ways and the purpose of yielding tangible results for the regional community, Belgium Campus contributes to the integration of South Africa in the global knowledge economy and the upliftment of its broader regional community.

[18] Parliamentary Monitoring Group, *ICT Research Development & Innovation roadmap: Department of Science and Technology briefing*, 2015. (PMG: https://pmg.org.za/committee-meeting/21012/).

Belgium Campus' Participative Regional Development Strategy

Incubation and Innovation Village and Master of ICT (Innovation)

Belgium Campus is a **private higher education institution** that has been offering advanced ICT-studies since 1999. Highlighting its success, Belgium Campus' has a 100% graduation employment rate and its graduates account for about 10% of the national ICT-graduates.

Belgium Campus' **Incubation and Innovation Village** is a new initiative providing an enabling, supportive and protective environment to incubate and accelerate innovative IT solutions for start-ups, enterprises and the public sector. The envisioned solutions are explicitly not intended to focus purely on technology, but rather to *use technology* in an innovative way across disciplines, meeting stakeholder's requirements.

The **Master of ICT (Innovation)** will serve as a stepping stone to the integration of ICT4Development into the Collaborative Innovation Model for Regional Development. Embedding cutting-edge ICT into innovation research will positively transform the cycle from fundamental research into applied research into real-life applications.

Why?

Addressing national development challenges in South Africa in order to foster broad national and regional development.

How?

Creating positive social impact and economic growth by the integration of ICT4Development in the Collaborative Innovation Model for Regional Development through a trickle-down mechanism.

What?

Incubation and Innovation Village and Master of ICT (Innovation) at Belgium Campus.

Participative Regional Development Strategy

With the establishment of the Incubation and Innovation Village and the offering of the Master of ICT (Innovation), Belgium Campus wishes to build upon its longstanding experience and its contribution to highly-needed skills development in South Africa through its Participative Development Model (PDM) for Education (cfr. Annex A). Building upon 16 years of experience, Belgium Campus has successfully contributed to increasing access to higher education through grants and bursaries, decreasing the human capital gap and unemployment in South Africa through producing readily employable and adequately skilled ICT-graduates and the internationalisation of students and academics through international partnerships and exchange programs. This serves as a testimony to Belgium Campus' experience and success in **Education4Development** as well as the feasibility of its new project.

The Participative Development Model (PDM) for Education of Belgium Campus aims to equip students with the relevant and up-to-date skills to ensure that students can be employed immediately upon graduation and remain employed in the long run. This aim stems from Belgium Campus' belief that the key factor for curriculum development is employability. The PDM for Education of Belgium Campus operates through a continuous interaction with all stakeholders, namely industry, students, academia and larger society. This continuous collaboration between stakeholders creates valuable a 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.

Building upon the Participative Development Model (PDM) for Education, the next step towards Belgium Campus' Participative Regional Development Strategy consists of the establishment of the Incubation and Innovation Village, with the incorporation of the Master of ICT (Innovation). The Innovation Village will serve as **the platform where education, research and innovation meet through ICT and embark together on yielding tangible social impact, through purposeful research projects and enterprises.** By integrating ICT4D in Belgium Campus' Collaborative Innovation Ecosystem Model, the new research model will aim at transforming fundamental research into applied research into real-life application, integrating cutting-edge ICT-knowledge and fostering continuous collaboration between key stakeholders (i.e. business, university, government and society). With **ICT4Development** being the overarching tool linking the Incubation and Innovation Village 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.

The incorporation of Belgium Campus' networking approach between stakeholders as well as the key principles of place management will allow for the social outcomes of the Innovation Village to be transformed from local development into broader regional development, i.e. primarily the larger Southern African region. In order to ensure and sustain regional development through the Innovation Village, Belgium Campus commits to adhering to the key principles of place management by engaging with key stakeholders towards an integrated master plan for the larger region on a long-term commitment basis. This stems from the wish that external players and communities benefit from the outcomes and advantages of the Innovation Village, with the purpose of fostering broad regional development. To this end, the Innovation Village needs to evolve and grow with its broader environment and respond to its current challenges and future aspirations. In other words, projects and enterprises need to evolve in line with regional trends, emerging technology, business and consumer demands and community needs. The best way to achieve these aims is to build advanced and sustainable partnerships, already established through Belgium Campus' continuous networking approach with business, government, academia and society.

All of these factors come together through Belgium Campus' **Participative Regional Development Strategy** by which Belgium Campus takes up its role in development cooperation in South Africa and its larger regional environment, in at least three important aspects.

First, Belgium Campus' efforts in Education4D and ICT4D are an important driver for the integration of South Africa in the *globalized knowledge society* through a continuous collaboration between government, business, academia and society as well as through a larger process of ICT-mainstreaming. Thus, by imbedding ICT4D in its efforts, Belgium Campus uses ICT in the achievement of development goals but it also advances the integration of ICT in society. In addition, Belgium Campus seeks to produce adequately trained graduates in ICT that are readily employable, possessing solid technical skills combined with effective soft- and business skills. Involving students and researchers in the Innovation Village will allow them to enhance their competitive advantage by performing innovative research and setting up enterprises, leading them to employment and to be active participants in the upliftment of their regional environment. An advanced integration of South Africa into the globalized knowledge society and economy in the short to medium term is a strong incentive to prevent the emigration of high-skilled workers and to attract foreign and domestic direct investment.

Second, the Incubation and Innovation Village's immediate outcome will be the establishment of *innovative projects, start-ups, and small to medium-sized enterprises* (SMEs). SMEs are vital to South Africa's economic growth – as 2010 figures show that 91% of formal business entities in South Africa are SMEs, contributing to approximately 55% of national GDP and contributing about 61% to employment.[19] Characterized by their dynamic and innovative nature, SMEs are able to positively impact on job creation, service delivery, poverty reduction and economic growth. Taking into account South Africa's well-developed business infrastructure and sophisticated financial system and its geographical position as a prominent member of the Southern African Development Community (SADC), private sector development serves to advance South Africa's international competitiveness.

Third, Belgium Campus actively contributes to the achievement of the Post-2015 Sustainable Development Goals (SDGs)[20], in a direct and indirect manner. Projects, enterprises and spin-offs incubated in the Innovation Village will contribute to many of the seventeen SDGs through a focus on improving the lives of local and regional communities and by the use of ICT in an applied and innovative way. More directly, Belgium Campus' established ICT qualifications, the new Incubation and Innovation Village, and the Master of ICT (Innovation) collectively contribute to following SDGs (cfr. Annex D):

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

[19] Gabrielle Habberton and Kelly Notcutt, *Unlocking the growth of SMEs and local businesses in South Africa,* 2015. (Impact trust: http://impacttrust.org.za/blog/unlocking-sme-and-social-business-growth-in-south-africa/).

[20] United Nations (UN), *Sustainable Development Goals Proposal*, 2015. (UN: https://sustainabledevelopment.un.org/sdgsproposal).

Pilot project: SmartCity

Whereas the Incubation and Innovation Village facilities are expected to be fully operational by July 2016, the Innovation Village is already operational through several pilot projects – including the SmartCity Project, which aims to improve service delivery in the Pretoria city area. The SmartCity Project is currently being developed by Belgium Campus' Innovation Village in cooperation with the city of Tshwane.

The SmartCity Project utilises the Smart Connect System, which enhances effective communication between citizens and government service departments through one single point of communication. In addition, it serves as a tool to visualise all processes, requests and needs of stakeholders as well as the quality of service delivery. This communication system allows the municipality's top management to make accurate strategic decisions and the correct allocation of resources. In addition, citizens are empowered through the ability to communicate with the municipality's service departments and to follow-up on the progress of their requests.

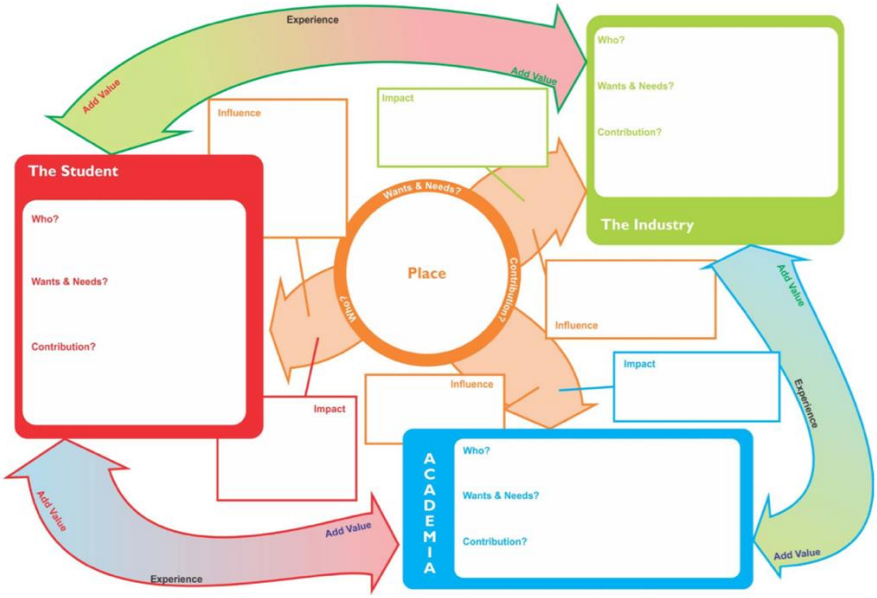
The SmartCity Project responds to an ever increasing need in South Africa, i.e. the improvement of service delivery with current service delivery being inefficient and lacking transparent communication channels between government and citizens. Immediate outcomes of the project include: the improvement of communication between all stakeholders, increased efficiency and transparency in service delivery, the collection of Big Data to facilitate government's decision-making and resource allocation and finally, restore trust between citizens and government's departments. The Smart Connect system is capable of being applied in other government departments communicating with citizens as well as other municipalities and provinces in South Africa.

As this SmartCity Project operates along the principles of the Belgium Campus' Participative Regional Development Strategy, the project has the ability to create social impact and change in the city of Tshwane and (if duplicated) beyond. The key factor in this project again lies with the advanced cooperation between key stakeholders, in this case citizens, government's service departments and government's top management. The Project adheres to 2 additional of the SDGs and its targets:

- Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Annexes

Participative Development Model (PDM) for Education

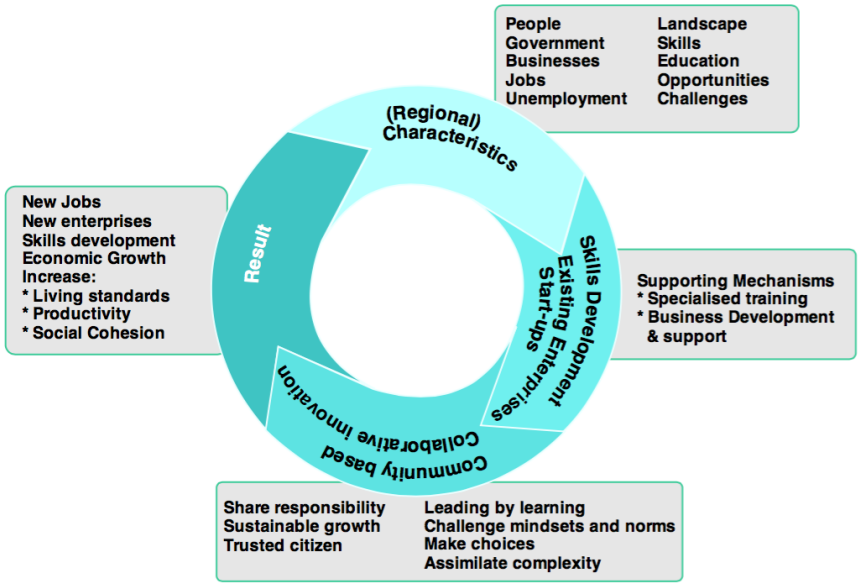


The **Participative Development Model (PDM) for Education** builds upon continuous consultation with and active participation of all relevant stakeholders, namely students, academia, the industry and larger society ("place"). The model assures that Belgium Campus equips students with the relevant and up-to-date skills to ensure that students can be employed immediately upon graduation and remain employed in the long run. It achieves this by putting employability at the forefront of its curriculum development, according to identified needs and input of all stakeholders.

The PDM operates through continuous interaction and revision with all stakeholders: *students* that develop intellectual ability and seek to build their academic and personal profile; *academia* that defines the curriculum and learning outcomes while keeping close contact with industry and larger society; *industry* that provides information on the skills and profiles required as well as insight on the working environment and context and *society ("place")* that provides input on goals, needs and challenges.

This continuous collaboration between stakeholders creates valuable positive feedback loops that allows for real impact by discovering tailored solutions and answers to the identified needs of all stakeholders. It is through the connection between students, academia, industry and larger society ("place") that Belgium Campus is able to provide its valuable and world-class-standard ICT education to its students.

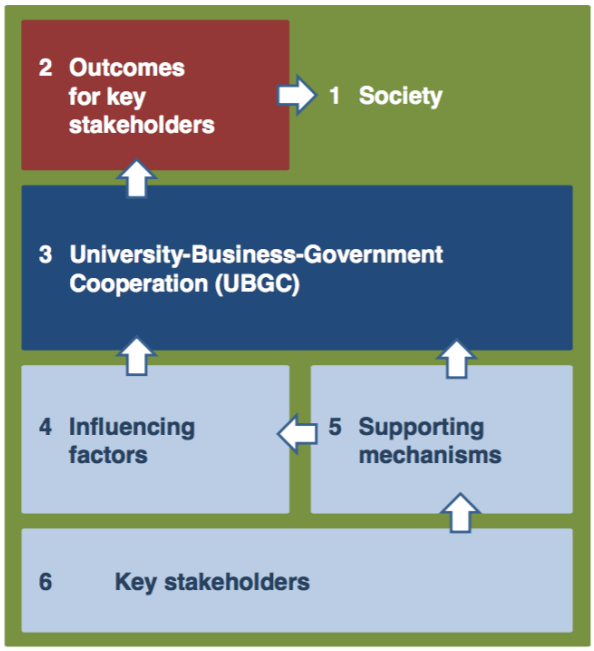
Collaborative Innovation Model for Regional Development



Building upon the University-Business-Government Cooperation (BGC) Model (Annex c) and the Model on the role of Universities in Regional Innovation Ecosystems (Annex d), Belgium Campus has developed its own unique regional innovation ecosystem model, namely the **Collaborative Innovation Model for Regional Development** which will be guiding the practices and processes of the Innovation Village.

By integrating place management into the innovation ecosystem model, a first step consists of mapping the needs and characteristics of the region in which the Innovation Village operates. Mindful of the identified regional characteristics and in order to develop impact-yielding solutions and applications towards those needs, the Innovation Village provides the necessary supporting mechanisms such as specialised training for skills development and business development and support to existing SMME's and start ups. In addition, a key feature of the innovation ecosystem model is the fostering of innovation through collaborative and extensive partnerships with all stakeholders. For this, several key principles are applied such as: shared responsibility, focus on sustainable growth, community-orientation, assimilation of complexity and creative thinking through challenging existing mind-sets and norms. The innovation ecosystem sees its value in the important results it yields such as employment, business and skills development as well as economic growth. The innovation ecosystem subsequently contributes to the economic and social transformation of the regional context, resulting in the identification of new needs and challenges for which the Innovation Village seeks to develop solutions and applications.

The University-Business-Government Cooperation (UBGC) Ecosystem Model



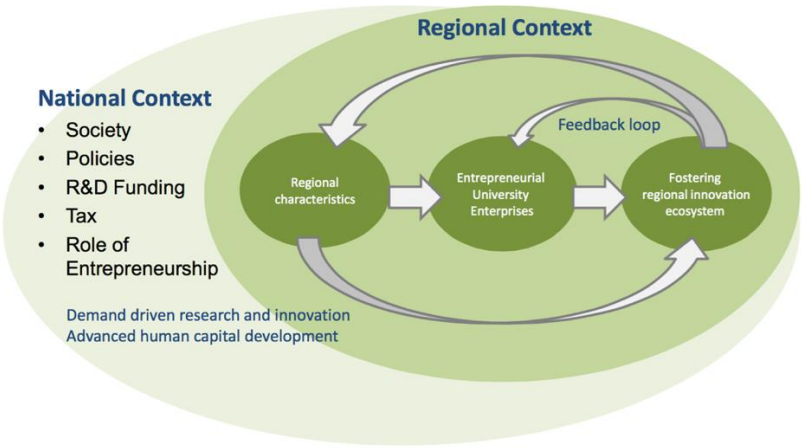
The **University-Business-Government Cooperation (UBGC) Ecosystem Model** of Belgium Campus was inspired by and builds upon the University-Business Cooperation (UBC) Ecosystem Model, published in the University-Industry Innovation Magazine (UIIM) in 2013.[21] The UBC ecosystem model serves to visualize how different types of university-business cooperation are formed and how value is created for stakeholders throughout the cooperation. Belgium Campus largely adopts the UBC Ecosystem model but adapts it to explicitly and directly include government and society as key stakeholders in the process itself.

University-Business-Government Cooperation (UBGC) is deemed to be essential to expand knowledge transfer across sectors and to contribute to the global knowledge economy, where increased competitiveness is a concern for each stakeholder: university (including students), business, government (at multiple governance levels) and indirectly also larger society. Cooperation is facilitated through supporting mechanisms such as cooperation strategies and frameworks while influenced by situational factors, drivers and barriers facing the different stakeholders. Designing a more holistic approach, the ecosystem model points to the different types of cooperation that can occur, such as academic and student mobility, curriculum development and R&D collaboration. Finally, the model demonstrates how UBGC can yield various direct outcomes for universities,

[21] Davey Todd, *Understanding Cooperation*, University-Industry-Innovation Magazine, 2013, (1).

business and government and indirect outcomes for the larger society, in the form of economic growth, employment and increasing living standards – contributing to larger regional development.

Role of Universities in Regional Innovation Ecosystems



Presented in the University-Industry-Innovation Magazine (UIIM) in 2013 by David Gibson and Lene Foss, the model visualizing **the role of Universities in Regional Innovation Ecosystems** serves to demonstrate the interrelation between regional characteristics, entrepreneurial universities and the regional innovation ecosystem.[22] The model identifies effective collaboration between business, academic and government ("Triple Helix") at the regional level as the key factor to integrate universities in the regional innovation ecosystem as a way to embark on its Third Mission to stimulate and sustain economic development – through stimulating entrepreneurship and innovation. The national and regional context in which the university operates constitute independent variables that influence the type of entrepreneurial university that directly impacts the regional innovation ecosystem development (dependent variable). In addition, the entrepreneurial university is impacted by feedback loops from the regional innovation ecosystem.

As an addition to the model, Belgium Campus positions itself as an entrepreneurial university that contributes to the regional innovation ecosystem in the context of South Africa, more specifically through the fostering of demand-driven research and innovation as well as advanced human capital development.

[22] Gibson David and Foss Lene, *Innovation Ecosystems*, University-Industry-Innovation Magazine, 2013, (1).

Sustainable Development Goals (SDGs): 17 goals, 169 targets

SDG 1: End poverty in all its forms everywhere

SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

SDG 3: Ensure healthy lives and promote well-being for all at all ages

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

4.3 by 2030 ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university

4.4 by 2030, increase by x% the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

SDG 5: Achieve gender equality and empower all woman and girls

SDG 6: Ensure availability and sustainable management of water and sanitation for all

SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all

SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

8.2 achieve higher levels of productivity of economies through diversification, technological upgrading and innovation, including through a focus on high value added and labour-intensive sectors

8.3 promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalization and growth of micro-, small- and medium-sized enterprises including through access to financial services

8.6 by 2020 substantially reduce the proportion of youth not in employment, education or training

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

9.3 increase the access of small-scale industrial and other enterprises, particularly in developing countries, to financial services including affordable credit and their integration into value chains and markets

9.5 enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, particularly developing countries, including by 2030 encouraging innovation and increasing the number of R&D workers per one million people by x% and public and private R&D spending

9.b support domestic technology development, research and innovation in developing countries

including by ensuring a conducive policy environment for inter alia industrial diversification and value addition to commodities

9.c significantly increase access to ICT and strive to provide universal and affordable access to internet in LDCs by 2020

SDG 10: Reduce inequality within and among countries

SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable

SDG 12: Ensure sustainable consumption and production patterns

SDG 13: Take urgent action to combat climate change and its impacts

SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at al levels

SDG 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

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