



Inspiring the innovation generation

The University of Pretoria (UP) is considered a leader in the region and is a recognised international player in the innovation space. The Faculty of Engineering, Built Environment and Information Technology (EBIT), in particular, has established unique capacity and expertise in this domain.

The University's Graduate School of Technology Management (GSTM) was the first of its kind in the country to offer programmes in engineering and technology management, and its Institute for Technological Innovation (ITI) was similarly the first of its kind to conduct research into the management of innovation. Furthermore, Enterprises University of Pretoria (E at UP) traces its roots to the Laboratory for Advanced Engineering, a consulting company that was established in the former Faculty of Engineering.

In addition to the formal technology and innovation management programmes that are offered, "innovation is spoken" throughout the Faculty, including in the innovative curricula of the respective departments, and the supporting world-class research activities. This is one of the reasons why EBIT's graduates are so sought after.

Innovation champion

In its efforts to encourage innovation and excellence in research, EBIT is proud to associate itself with remarkable alumni of the Faculty. One such alumnus is Prof Calie Pistorius, currently Director and Principal Consultant at DeltaHedron in the United Kingdom, which specialises in the management of innovation.

At UP, Prof Pistorius is well known for his role as Vice-Chancellor and Principal of the institution between 2001 and 2009, and for his significant contribution to the success of the University during this period.



→ Prof Calie Pistorius.

He is also a former Dean of EBIT, a former Head of its Department of Electrical, Electronic and Computer Engineering, and Director of the ITI. He served as Chair of the National Advisory Council on Innovation (NACI), a statutory body advising the Minister of Science and Technology (and through the Minister, the Cabinet) on policy issues pertaining to national science, technology and innovation strategies and policies.

Defining innovation

According to Prof Pistorius, "innovation" is one of those terms that has become a bit of a cliché. It is generally understood to describe what is new, novel and "out the box" – perhaps somewhat extraordinary.

"From a serious innovation management point of view, I like to think of innovation as having two components: both of which need to be present for a successful innovation," he says.



→ *EBIT is home to exceptional members of the Innovation Generation.*

The first component is invention. This involves the creation of a new product, process or service. It very often combines existing ideas with new ones. The second component is market acceptance. This is where the market decides whether it is going to adopt the invention. This results in the diffusion of the innovation into the market. "Technology does not adopt itself," explains Prof Pistorius. "It is people who make the decisions. If there is no market adoption, then the innovation remains an invention".

According to Prof Pistorius, it has been said that inventions create new knowledge, but innovations create new wealth. In this context, the term "wealth" should be interpreted widely. It may mean economic wealth, but it can also mean social, cultural or environmental wealth. "What is important," he says, "is that there is impact, and a difference is being made".

Surveys of business leaders more often than not indicate that "innovation" is one of their top priorities. There is a general recognition in business that innovation is important for growth and survival. However, at the

same time, while these surveys acknowledge the importance of innovation, many business leaders are not overly confident of the ability of their companies to fully understand the notion of innovation and how to innovate. "There is a dire need for those individuals who understand the process of innovation to share their expertise," he observes.

Prof Pistorius goes on to explain that innovation is not restricted to the technological field: it can take place across the board. There are many examples of innovations in social and political systems, finance and insurance, marketing and fashion.



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From the viewpoint of technological innovation, however, the major issues that business leaders need to deal with are that all companies rely on technology in one way or another, and that change is a key feature of all technologies. This combination implies that the dynamics of technological change and emerging technologies have a strategic impact on businesses, and present strategic opportunities, risks and threats that business leaders need to deal with.

It not something about which businesses really have a choice. If they choose to ignore innovation, it would be akin to "fumbling the future", as many companies that were once great have discovered. At the same time, many start-up companies that have embraced new technologies and business models of the new order have become very successful and have risen to become business leaders in industries that did not even exist a few decades ago.

How does South Africa rate in terms of innovation?

South Africans have always been very ingenious and inventive, and many innovations have originated in South Africa over a long time.

South Africans have also been very good at adapting technologies to local conditions and environments. The rapid diffusion of mobile technology and new applications that have been built on these technologies are good examples.

South African engineers and managers are generally held in high esteem across the globe when it comes to the management of technological innovation. The academic programmes in engineering, technology and innovation management at universities such as UP and the University of Stellenbosch are also considered to be top notch internationally.

Establishing an innovation generation at UP

Prof Pistorius recalls that when he was appointed as Vice-Chancellor and Principal of UP in 2001, the University's students and researchers were branded as "the innovation generation".

"This was also the title of the University's strategic plan at the time," says Prof Pistorius. "The thrust was to create an environment where innovation could flourish, focusing not only on the acquisition and creation of new knowledge, but also on the impact and the difference the University (its students, staff and alumni) could make." It was about achieving greater outcomes and proactively contributing towards shaping a better future.

According to Prof Pistorius, UP is known for its innovative approaches and entrepreneurial spirit; not only with regard to the nature of its research outputs and thrusts, but also the way in which it conducts its activities. It was the first university in the country to develop a large-scale e-learning programme using the internet, which benefitted both distance and residential students. It was also the first university to introduce a technology-enhanced integrated service centre for its students. "But I think it was the University's very successful structure of campus enterprises



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that best illustrates its commitment to innovation," says Prof Pistorius. These are vehicles through which the University's expertise is made available to the public through continuing education, consulting and commercialisation. These enterprises are active across the world and continue to be considered by many to be a truly world-class example of how a university's knowledge exchange and transfer should be done.

Becoming a recognised global leader

When questioned about the challenges tertiary institutions face to become a leader in the management of innovation, Prof Pistorius remarks that the University of Pretoria is already a leader in the management of innovation, certainly in a national

and regional context. "The challenge all universities face in this regard is to maintain and strengthen its leadership position in a global context," he says.

Universities across the world are increasingly recognising the value and impact of teaching programmes and research in the management of innovation. This is often linked to the promotion of entrepreneurship and the incubation of new businesses. In this regard, UP has a strong brand in the GSTM. "The challenge now is to become a recognised global leader," he observes.

According to Prof Pistorius, innovation drives economic growth. "It is therefore imperative that this is addressed in a national innovation strategy that should also focus on enhancing the nation's competitiveness. "Ultimately, however, it is not policies or strategies that create growth: it is people who create a better future through innovation," remarks Prof Pistorius. "It is very often a combination of innovations from different and sometimes unexpected areas that trigger the major disruptions. It is the "wave of creative destruction" that brings renewal and growth," he says.

One must be aware of the fact that the technologies and structures that may have served us well in the past, may have reached the end of their shelf life, and should be phased out. According to Prof Pistorius, the philosopher Machiavelli reminds us that innovators have always faced resistance from those who benefit from the status quo and only lukewarm support from those that are trying their best to imagine how the disruptive innovations will contribute to a better a better future.

It is very often not a question of "believing when they see it", but rather of "seeing it when they believe it". The task of an innovator is therefore not always an easy one, but innovators are the real heroes to be celebrated. These are the people who bring renewal and inspire growth and prosperity; sometimes against great odds. 🌟