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Media Release

S.E.T. for socio-economic growth

National Science and
Technology Forum

Lessons in Innovation from South Africa

Considering the innovation chasm

When attempting to take an academic concept through to commercialisation, there seems to be a gap. This inability of academic research to reach the market as products and services is known as the 'innovation chasm'.

This became a key theme of a discussion panel on 'Lessons in Innovation from South Africa'. The event was part of [ISPIM Connects Global 2020](#), an online conference that ran from 6-8 December 2020. The [National Science and Technology Forum](#) (NSTF) represented South Africa. The discussion panel was held on 7 December 2020 and moderated by Executive Director, Jansie Niehaus.

Celebrating the World of Innovation

[ISPIM Connects Global 2020](#) 'Celebrating the World of Innovation' was a 24-hour virtual event bringing together researchers, managers, business and global thought leaders to share insights on key innovation management topics. The event 'moved' around the world through 24 hours, starting in Japan and ending in Australia. The conference included further presentations, panels and workshops.

The [International Society for Professional Innovation Management](#) (ISPIM) is a community of members from research, industry, consulting and the public sector that focus on innovation management ie how to successfully create new products, processes and services from ideas to stimulate economic growth.

Technology stations at universities

The South African Technology Station Programme (TSP) enables universities to provide technology development services to small, micro and medium enterprises (SMMEs). The aim is to use innovative science, engineering and technology solutions for complex engineering challenges. TSP is an initiative of the Department of Science and Innovation and implemented through the Technology Innovation Agency.

Ms Nickey Janse van Rensburg is the Manager of Process, Energy and Environmental Technology Station (UJ-PEETS) at the University of Johannesburg. This technology station was awarded the NSTF-Lewis Foundation Green Economy Award at the 2019 NSTF-South32 Awards. The award highlighted their work in supporting more than 1000 SMMEs in the green economy. By offering subsidised engineering services, UJ-PEETS's assistance ranges from research and development to the demonstration of prototypes to industry.

Janse van Rensburg explained that triple helix collaborations are at the centre of what UJ-PEETS and other technology stations do, making higher education institutions more accessible. (The triple helix partnership is an innovation model describing interactions between academia,

industry and government for economic and social development.)

Universities need to be responsive to societal needs

A key challenge is embedding 'useful innovation' within universities' priorities, where the university becomes more responsive to societal needs. Janse van Rensburg noted that universities define their key performance indicators (KPIs) on training students, the number of publications and the impact number of those publications.

Institutions of higher learning need to include social development innovation, goals and metrics in addition to traditional output. Janse van Rensburg pointed to the [Times Higher Education Impact Rankings](#) as an example. This ranking assesses universities against the United Nations' Sustainable Development Goals. It's about shifting from research output and the value of publications to a more holistic outlook that includes impact on society.

A further benefit is that students and academics can rally around 'real problems'. She noted that academia and research tend to be abstract, whereas applied research projects must function effectively in society. She sees that students learn better and come up with more creative solutions in this paradigm.

Understanding pathways to innovation

Staying within academia, Prof Lindiwe Zungu, Executive Dean of the College of Graduate Studies at University of South Africa (UNISA), also spoke on challenges to innovation within South Africa with a focus on institutions of higher education. She, too, urged for further partnerships between industry, government and civil society to ensure that research addresses real challenges. Furthermore, she noted that there is a general lack of understanding about the pathways to innovation across the system.

Zungu is a multiple award-winning research professor and alumni of Harvard Medical School, as well as a Professor of Occupational Health and Safety. She was awarded the TW Kambule-NSTF Researcher Award at the NSTF-South32 Awards in 2019. This was in recognition of work done to cater to the health and safety needs of miners, with a focus on women. The work included developing guidelines to assist the South African mining industry.

As a result of her research, the industry implemented new protective gear designed specifically for women working underground. She has also addressed other health and safety issues including Post Traumatic Stress Disorder (PTSD).

Gradual improvement is also innovation

Prof Richard Walls, Associate Professor, founded and heads the Fire Engineering Research Unit at Stellenbosch University, called FireSUN. The research group develops fire safety engineering education while pursuing methods to improve informal settlement fire safety and structural fire design. Investigations include analysis of structures and materials in fire, forensic fire investigations, and more. He was awarded the TW Kambule-NSTF Award: Emerging Researcher at the 2020 NSTF-South32 Awards.

Informal settlements receive a great deal of political attention and millions can be spent on solutions. However, Walls said that historically there has been a lack of evidence around which interventions work or don't work, and why. Without this information, money can be misspent. For Walls, innovation can include "shooting down bad ideas" as well as promoting good ideas.

He noted that no single intervention is going to solve a problem like this ie dense housing with lots of combustible materials and energy sources like candles and paraffin stoves. With an evidence-based response, we can gradually move to reduced impact. While the ultimate solution is producing better homes, informal settlements aren't going away.

CSIR creates paths to innovation

Dr Vhahangwele Masindi, Principal Research Scientist at Council for Scientific and Industrial Research (CSIR) was awarded the TW Kambule-NSTF Award: Emerging Researcher at the 2020 NSTF-South32 Awards. He has made significant contributions around environmental monitoring and wastewater treatment. Masindi said that he has seen a dramatic drop in the quality of surface water resources. At the same time, the treatability index of surface water has increased drastically demanding high chemical loading to bring it to the required international standard.

Masindi has patented, piloted, and published on numerous wastewater treatment technologies. He has developed technologies for the removal of toxic and hazardous chemicals from acid mine water, municipal effluents, and contaminated ground water. These 'waste' chemicals are then converted into valuable resources with the aim of generating revenue to offset the running costs of the technology.

He noted that the CSIR creates a path to innovation for researchers, allowing research from the lab to go to pilot scale. There are also opportunities to work with industry, the up-takers of technology. Industrial partners also have input when developing technologies, ensuring it fits into a real-world context.

Business out of bridging the innovation gap

Dr Antonel Olckers is the CEO and Founder of DNAbiotec, a knowledge-based biotech company founded in 2001. The company has clients from 44 countries. Part of the company's services is to translate clients' IP into products and services thus helping clients take research results or data to market ie productisation.

Rather than seeing the traditional 'steps' to market as a pipeline (concept, research, development, productisation, manufacturing, and commercialisation), DNAbiotec approaches the innovation value chain as a network. Here every node is connected to every other node. It's a complex system with multiple actions connected to every node. On top of this are factors that impact on the network such as legal and the policy frameworks and ethics.

Olckers, herself, moved from academia to entrepreneurship. She said that she never expected the learning curve for a scientist entering the private sector to be quite so steep. This is a particular challenge in South Africa's National System of Innovation – people are entering into entrepreneurship and business well educated but not market ready.

South African Research and Innovation Management Association

Dr Andrew Bailey is the Senior Manager: Innovation in the Research Contracts and Innovation Department at the University of Cape Town. He is responsible for the protection of IP, implementation of the institutional IP policy, raising awareness of IP, as well as commercialisation of IP and technology transfer. He is also president-elect for [SARIMA \(South African Research and Innovation Management Association\)](#).

He says that SARIMA is for people who are guiding research to maximise innovation along the value chain. The association covers the SADC region, working on capacity development, engaging with various governments on IP policy development, and raising awareness among researchers about IP development. SARIMA is also a platform for promoting best practices.

Bailey sees SARIMA playing an important role, particularly around promoting upskilling and becoming internationally recognised as a registered technology transfer or research management professional.

About the NSTF

The National Science and Technology Forum (NSTF), established in 1995, is a broadly-representative stakeholder body for all science, engineering and technology (SET) and innovation organisations in South Africa, which seeks to influence policy formulation and delivery.

The NSTF Awards are unique in SA, recognising the outstanding contributions of individuals and groups to SET and innovation.

The science bursaries page provides information on bursaries and bursary providers for science, engineering and related studies.

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