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UCT masters graduates' projects look to contribute to society

Professor David Cooper's recent book, *The University in Development*, highlighted the need for universities' research agendas to include a strong social development component. University of Cape Town students - some of which are graduating this week - are taking that to heart.

The engineer with corrosion-resistant guts

In 2010, he was granted a scholarship from the Concrete and Cement Institute to register for a master's degree in concrete materials and structural engineering at UCT.

In a journey that spanned nearly 7 years, Lesotho born Ntseuoa Motsieloa will graduate this week with a degree that he believes will make a valuable contribution to producing acid-resistant sewer pipes.

Motsieloa's story began in the rural areas of Maseru in Lesotho, herding his father's cattle, while attending St Benedict's Primary School in the small village of Ha Khanyetsi. Far from being discouraged by his school-leaving certificate that was not sufficient for direct entrance into UCT, Motsieloa enrolled for a Bachelor of Science degree in physics and computer science at the National University of Lesotho.

Inspired by the story of astronomer Dr Thebe Medupe, he set out to raise his marks. Motsieloa said: "Reading about his success journey despite poverty inspired me, and I also wanted to go to UCT, like he did." The hard work paid dividends when he applied (successfully) to study civil engineering at UCT in 2005. He graduated with a first-class pass in 2009, with his thesis rated the second-best in its category (cement and concrete materials).

The topic is relevant both in South Africa and globally, he says. "The consequences of the structural failure of these pipes are destructive; the closure of roads for repair and rehabilitation causes havoc, and may cost more than the repair itself."

What happens when that timber is converted from furniture to fuel source?

Research by Rissa Niyobuhungiro, who graduates from UCT this week with a master's degree in chemical engineering, could literally benefit the women and men on the street.

Her dissertation titled, *Investigation of CCA-Treated Wood in Informal Caterers*, suggests that the smoke from fires fuelled by such wood poses a significant risk to people and the environment at large. Chromated copper arsenate (CCA) is one of the chemicals used for the preservation of timber, aiding weather-resistance and keeping decay fungi and wood-attacking insects at bay. Today, a significant number of small (catering) businesses offering wood-fired food are a common sight alongside South African streets, and a significant number use CCA-treated wood to fuel their fires.

Niyobuhungiro said: "My research has really opened my eyes to the environmental impacts of burning treated wood and the associated health hazards to those exposed to the smoke who, unfortunately, are poor urban dwellers."

She describes her impending graduation as a "dream come true", and – credits her supervisor, Associate Professor Harro von Blottnitz, and other colleagues at the university with helping her achieve her goal.

No place to hide

Stacey Rukezo, soon-to-be master's graduate of the Department of Electrical Engineering built a radar transceiver that was, in part, derived from a project originally undertaken by UCT's Radar Remote Sensing Group from 2004 to 2007. Called the South African Synthetic Aperture Radar II (SASAR II), that project was designed as a 'flying laboratory' that could provide radar images of the earth's surface.

Her project is a modified, scaled-down version of the SASAR II radar, but uses some of the hardware from that project for a new line of research. Her transceiver is intended as a prototype for a 'network radar', which uses multiple receivers scattered over a large area.

Rukezo said: "This type of radar provides improved detection of moving targets, such as drug and contraband smugglers in small aircraft, and also poachers operating off the coastline."

A paper on her project, co-authored by herself, her supervisor Professor Mike Inggs and Dr Amit Mishra, was presented by Mishra at the International Radar Symposium in Warsaw, Poland.

Rukezo could not attend because of work commitments in Germany, where she is currently doing a STEP (Students' Experience Programme) internship in the department of environment perception at Daimler AG.

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