



Unstoppable Nthatsi is scaling greater heights

Nthatsi Koloji has an unquenchable thirst for education, information and knowledge.

She simply cannot put her books down, although she obtained a National Diploma in Mechanical Engineering from the Cape Peninsula University of Technology in 2006 and immediately entered the world of work when she joined leading dairy and food corporation Parmalat as a trainee technician.

Several years after graduating, Ms Koloji, of Zastrom in the Free State, is still very much at it.

In 2012, she successfully completed

a Baccalaureus Technology degree in Mechanical Engineering at the University of South Africa.

A year later she proceeded to the Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth after she was afforded an opportunity to complete an internship in Mechanical Engineering.

But that, for her that was still not enough.

“At the end of the internship, I decided to enroll for a Master’s degree in Mechanical Engineering,” she says.

She then started working on her research project, which she started in 2014.

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Nthatsi Koloji ... "I have grown immensely"

Her studies were funded by the Nuclear Energy Corporation of South Africa (NECSA) and merSETA, through the Women in Engineering Leadership Association (WELA), of which she is a member.

Her research topic was, "Friction Processing of Thin-Walled Zircaloy-4 Tubes for the Nuclear Industry."

The topic involves friction welding of thin-walled tubes, machining fixtures, testing of weld joints in different methods and analysing the results.

It gives particular focus to the nuclear programme.

She says the research was about developing a friction welding technique for joining thin-walled tubes onto the end-caps to create fuel rods.

The reactors in the nuclear power plants at, for example Koeberg in Cape Town, make use of fuel rods for the cladding of fuel (uranium).

"A typical fuel rod consists of a thin-walled zirconium alloy tube welded onto the end-cap on both sides. At present, welding of the tubes onto end-caps is done using fusion-welding techniques," she explains.

"The fusion techniques melt materials to join them while in friction processing (welding). The joining takes place through the rubbing of materials to generate frictional heat and join at the temperatures just below the melting point.

"There are a number of advantages to friction welding, such as the process taking less time and not being harmful to the environment. These are some of the reasons friction-welding is proposed as an alternative joining technique for thin-walled Zircaloy-4 tubes for the nuclear industry."

Ms Kolozi enjoys the metallurgical

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aspect of the research and says she has grown immensely in her chosen field.

Asked about the challenges of her research project, Ms Kolozi says the welding of thin-walled tubes has been quite daunting.

"It is not easy to find the tube fixture [because it is very thin]. The testing of small samples is also a bit of a challenge," she says.

Ms Kolozi also led a group of young women on three technical projects at WELA: the solar power system for study rooms during load-shedding, connecting solar power to Eskom power, and modification of the existing table wheelchair user.

Just like any other woman in the engineering field, she is not immune to male scrutiny.

"To be a woman in a male-dominated field is always a challenge. My male counterparts have a perception of the role of women. Fortunately, they are very professional and very helpful.

"The under-representation of women in fields like science and engineering is still a concern, but of late more women have been entering these fields."

Though women represent one-fifth of the engineering student population, they constitute only 10% of the engineering workforce.

She says her role model is Professor Esther Akinlabi, who was selected as a member of the South African Young Academy of Science in 2014.

"What inspires me most about her is the fact that she completed her PhD degree in friction-welding at NMMU. She is now an engineering researcher at the University of Johannesburg."

Ms Kolozi is one of the women who are changing the face of engineering and positively influencing thousands of students.

She sees the growth and success of women in engineering as fundamentally important in contributing to job creation and for women to stake their claim in the all boys' club.

Her advice to other women who aspire to reach greater heights in engineering is that they must not stop searching for more knowledge and information.