Few African women graduating in science

Proportion of graduates in SA lags behind population demographics

Sarah Wild

frican women – the largest demographic in the country — are siggraduates at some of SA's top higher education institutions.

At the University of Stellenbosch and the University of Cape Town (UCT), African women — including those from the rest of the continent account for 3% and 16% of science graduates, respectively, the worst output of this demographic in the country.

Women represent more than half of science graduates at some historically black universities. At Walter Sisulu University, three of every five science graduates is an African woman. At the University of the Western Cape and the Cape Peninsula University of Technology, coloured and African women comprise 52% and 53% of their science graduates, respectively.

There is also a lack of diversity in science academia.

This is often blamed on a "leaky" pipeline: African women leave the sciences before they are qualified enough to be hired as academics.

According to the 2013-14 National Survey of Research and Development, Experimental there were about 2,100 African female researchers in SA, accounting for 12% of the total number of humanities, social science and natural science researchers. There is no breakdown indicating how many of these researchers are in the science, engineering or technology (SET) fields.

"We are losing out on a talent pool that can contribute by providing a different perspective and bringing a diversity of ideas, as we all see the world differently," says Nox Makunga, an associate professor in medicinal plant biotechnology at Stellenbosch University.

According to the Department of Higher Education and Training's 2014 data, African women comprise 32% of all science graduates. In 2014, about 26,000 people graduated with either a three- or four-year scirepresented among science ence degree. About 8,300 of

Phethiwe Matutu, chief director of human capital and science promotion at the Department of Science and Technology, points out that the number of African female science graduates does not lag behind SA's population demographics by a large margin.

AT THE UNIVERSITY OF STELLENBOSCH AND UCT, AFRICAN **WOMEN ACCOUNT** FOR 3% AND 16% OF SCIENCE GRADUATES

"If you consider that blacks, including Africans, coloureds and Indians, all together constitute 90% of the population, then about 45% of SA's total population are black women. If you take out coloured and Indian, then African women would be about 39%," she says.

"But 32% is not 39%, so we are lagging behind in terms of their representation.... It's not as bad as the levels of honours or masters or PhDs. That's where there is a major disjuncture."

Eugene Cloete, vice-rector for research, innovation and postgraduate studies at Stellenbosch University, says he can't think of a university that is pushing back against transformation. He acknowledges the diversity of the university's science graduates is a problem and says the university has instituted policies to attract and support African students.

"Stellenbosch University structurally had problems in attracting black students in general, not only in science, and

those were African women.



Root causes: Nox Makunga, an associate professor in medicinal plant biotechnology, says more role models and greater public visibility are needed to encourage African women to study science. /Trevor Samson

language was a big issue." Cloete says. "Science is difficult enough, and to do it in a language you don't understand

makes it impossible." In 2016, the university changed its language policy so that lectures are conducted in English. The university is also placing "economically vulnerable" students in residence and

has widened its feeder network to include admissions from previously disadvantaged schools.

"It is not an overnight fix, but five, six years from now, it will be different," Cloete says. "The school system is delivering more black women who can

study science and engineering." Prof Pilate Moyo, deputy dean for engineering and the

Graphic: KAREN MOOLMAN Source: SARAH WILD

built environment at UCT, says: "There has been a steady increase of female students in general, now at about 30% in the undergraduate programmes. do not have the split of this 30% in terms of racial grouping, but the cohort of black and coloured students is significant."

The University of Pretoria has the highest number of science graduates in the country. In 2014, it produced 2,477 – just under one of every 10 science graduates produced that year. Of that cohort, African women accounted for 20%. "Unfortunately, black stu-

dents are more likely to be disadvantaged by their school education and, globally, women are less likely to pursue careers in maths, science, engineering and technology," the university says in a statement. Institutions with a historically

high proportion of African women science graduates, such as the University of KwaZulu-Natal (UKZN) and the Cape Peninsula University of Technology (CPUT), say they have high enrolment.

Universities across the country are unable to meet the high demand for first-year places as the government subsidy to higher education institutions has been consistently declining for the past decade.

A common thread among universities with a high proportion of African women science graduates is role models.

"In an attempt to diversify our own academic staff profile, we launched the Khula programme in 2009," says Lauren Kansley, a media liaison at CPUT.

"It trains talented students to become academics and ultimately replenish the ageing academic staff, while meeting equity targets."

In 2016, Science and Tech nology Minister Naledi Pandor launched Sarchi 42: a tranche of coveted research chairs set aside exclusively for women professors. Prior to that, four of every five research chairs — of which there were 153 – were occupied by men.

At the programme's launch, Pandor said it aimed to give women "the opportunity that men have always had".

The South African Research Chairs Initiative, managed by the National Research Foundation. enables chairs to focus on research and training postgrad uate students.

UNFORTUNATELY, **BLACK STUDENTS** ARE MORE LIKELY TO **BE DISADVANTAGED** BY THEIR SCHOOL **EDUCATION**

"Countrywide, there is only handful of black South African female academics in science," says Cloete.

"To find black women professors — it's like a nugget."

According to the 2013-14 National Survey of Research and Development, Experimental African women represent 3% of academics with a PhD - a necessary requirement for becoming a professor.

In 2014, SA produced 1,130 science doctorates. Only four universities were responsible for just under half of those: UKZN (147), UCT (136), the University of Pretoria (129) and Stel-

lenbosch University (126). Of these, only UKZN met the national proportional average of African women, at 15%. At UCT, African and coloured women

each represented 7% of doctorates awarded, while at Stellenbosch University, they were 4% and 3%, respectively.

Cloete says part of Stellenbosch University's struggle – experienced by tertiary institutions across the country – is getting African women through the system.

A 2015 report commissioned by the Department of Science and Technology looks at the "leaky pipeline" of postgraduates. Using 2001 bachelor graduation data as their benchmark, the Centre for Research on Evaluation, Science and Technology found that of the 40,908 bachelors graduates from all disciplines, only 897 completed their doctorates by 2013.

In natural sciences, the 4,116 bachelors graduates of 2001 yielded 95 PhDs. In health sciences, 4,665 graduates resulted in 61 PhDs, while engineering and technology had 2,797 bachelors graduates, with 37 obtaining doctorates.

Even though PhD numbers are increasing — from 1,421 in 2010 to 2.258 in 2014 – the study found that the average time to complete an honours degree was three years, a masters degree, five, and a doc-

torate, seven. The report notes that the "progression and completion rates are the lowest for African students compared to the other races", and that the main reason

cited is financial. Black students often have to work while studying and are more likely than other students to drop out due to external pres-

Funding institutions have recognised this at a postgradu-

sures such as family.

ate level. During her 2016 departmental budget vote, Pandor noted

that the department invested R741m in supporting 14,500 postgraduate students, 67% of whom were black and 57% of whom were female.

Previous targets in 2014, were to have 71% of bursaries earmarked for black students and 55% for women by the 2016-17 financial year.

Makunga is an outspoken advocate of women in science. She has a long list of what needs to be done to attract African women into science.

"Role models, greater visibility of scientists in the public space, pay-gap issues linked to science and industry careers need to be addressed, mentorships, a better understanding of opportunities afforded by postgraduate studies and better basic education," she says.

"There are several factors which I think contribute to this. The STEM science, technology, engineering and maths careers are not seen as attractive by black women....

"Public visibility, I think, is crucial to increase numbers and to explain career options and what science careers for black women actually entail."

Matutu was a senior mathematics lecturer before she joined the Department of Science and Technology.

"What we are experiencing right now at universities, when students are talking about the decolonisation of their curriculum, what they are not seeing in front of them are African women," she says.

"You can't say it doesn't matter. It puts role models in front of the African students, who are women," she says.

The Department of Higher Education and Training had not responded to queries at the time of publication.

NARROW PIPELINE

HOW SA's BLACK FEMALE SCIENCE GRADUATES COMPARE

