

Internships

IN THIS EXPERIENTIAL learning programme, learners gain practical experience in line with their studies and research fields. They acquire core research and professional skills within a defined time period of up to one year.

It is of strategic importance for the CSIR to grow and strengthen the pool of entry-level professional researchers and to also bridge the typical chasm between academic and professional research work.

Dikeledi Pitso



Children's needs should inform transport policy

SINCE JOINING THE CSIR in July 2006 as an intern in the organisation's rural accessibility and development research team, Sipho Dube has been involved in research aimed at developing improved methodologies to ensure that the interests of children are at the forefront of policy and planning. With a BA (Hons) in environment and development studies from the University of KwaZulu-Natal (UKZN), the young intern is ideally placed to undertake the significant amount of fieldwork involved in his chosen field of research.

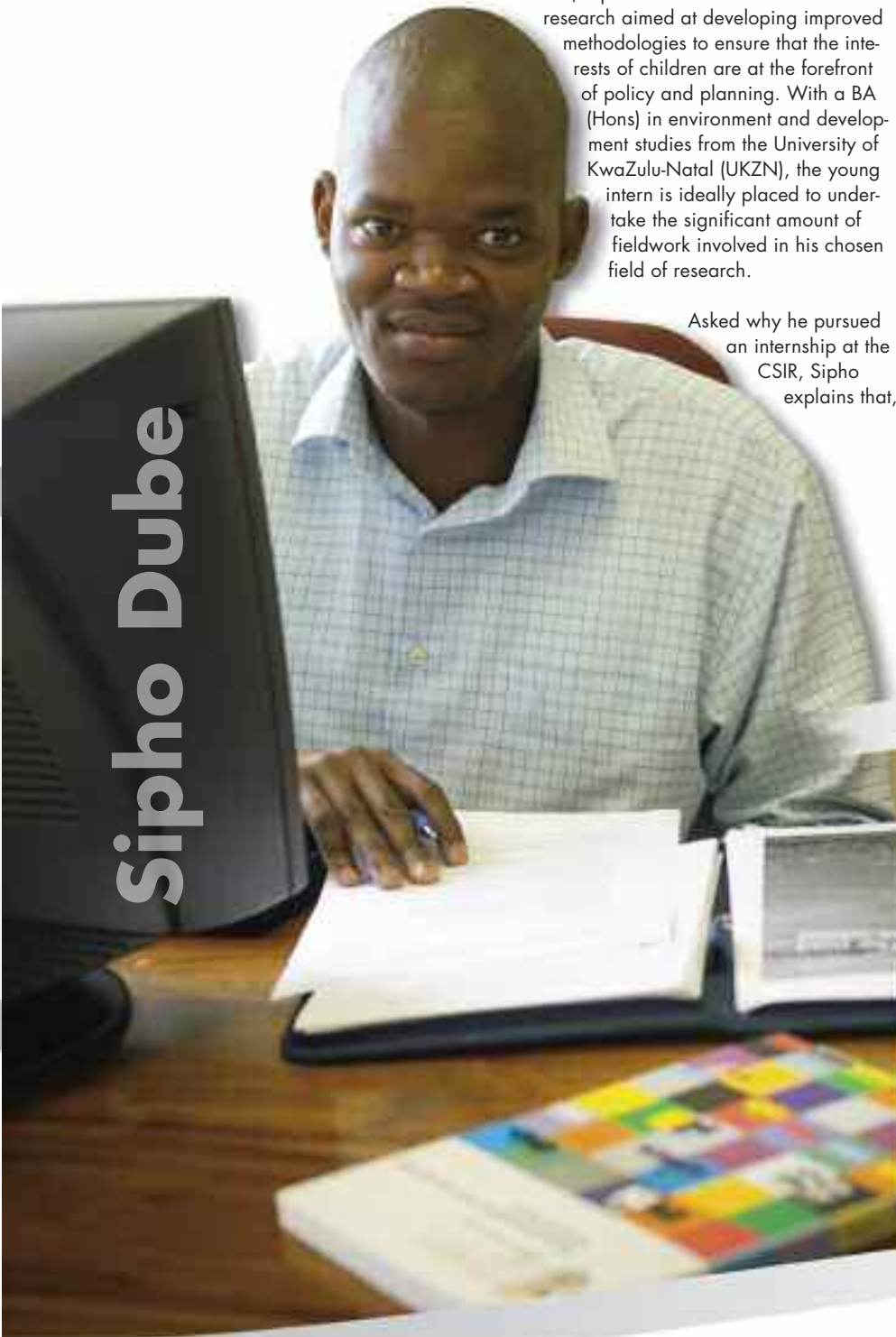
Asked why he pursued an internship at the CSIR, Sipho explains that,

Thousands of children in rural areas throughout the developing world, including South Africa, brave the elements daily on their long walks to school. CSIR intern Sipho Dube is confident that research can play a significant role in ensuring that the needs of these children, transport stakeholders in their own right, are considered when national transport policies and strategies are formulated.

as an undergraduate, he used to attend lectures by Rob Hounsome, one of the CSIR's environmental experts. "I was intrigued and inspired by the idea of working for a national research council and the CSIR's strong focus on human capital development was a definite plus for me," he says.

Sipho is currently studying towards a Master's degree in geography at the UKZN, and is clearly passionate about the CSIR's research in the field of child mobility.

Sipho Dube



"Children and youths under the age of 18 have traditionally received very little attention in mobility studies in developing countries, despite the fact that affordable and reliable transport is critical in enabling access to fundamental services and resources, such as health care and education," he explains. "This is especially true amongst children in rural and peri-urban areas, for whom isolation, long distances, poverty levels, poor infrastructure and limited transport services inhibit access to services and resources."

Since the impact of infrastructure provision is seldom viewed from the perspective of children and the youth, little systematic research has been undertaken to inform policy and strategy formulation around rural accessibility issues relevant to this group of stakeholders. Siphso points out that, in the majority of cases where research concerning this group is conducted, it is carried out by adults, rather than integrating children's right to meaningful participation in processes directly affecting them. "Without children's active input into research issues affecting them, strategies and policies will continue to be devoid of the voices of the very people they impact upon," Siphso comments.

Some two years ago, the CSIR undertook a pilot study on the mobility and access issues impacting on South African children in rural areas. The study, which formed part of an international study to test a

child-centred participatory research methodology, illustrated that children were able to conduct research among their peers, as well as disseminate information and ideas around child-centred research among one another.

"The children enjoyed taking the initiative and being responsible for planning and conducting research," Siphso says. "They were clearly capable of generating relevant questions around a particular topic and developed the ability to probe more deeply into areas of relevance."

Building on the work undertaken in the pilot study, the CSIR is strengthening its knowledge base on issues around child mobility and participatory child-centred methodologies, and refining the methodology applied in the original study. The ultimate aim is to create an evidence-based toolkit and methodology to encourage government to engage children in the formulation of national policy.

Siphso has the good fortune to be mentored by CSIR researcher, Mac Mashiri, an expert in rural infrastructure and development research. "Mac is well known for his consistent and innovative contributions in

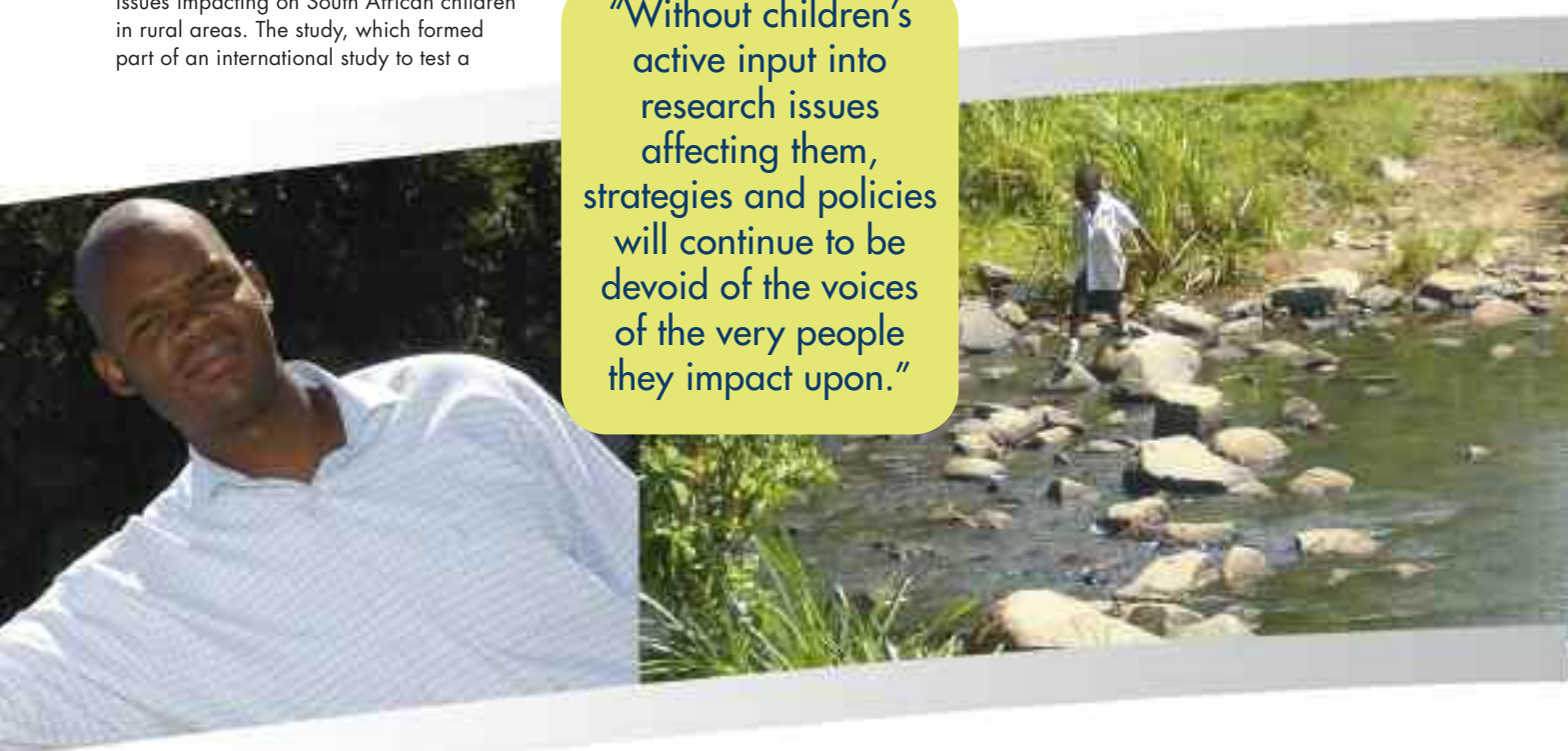
the field of rural infrastructure and development, and I am fortunate to have the benefit of his knowledge and expertise," says Siphso.

One of the highlights of Siphso's internship has been the opportunity to co-author a paper on the CSIR team's research findings to date. Titled *Unpacking child-centered approaches to child mobility and access research*, the paper is still to be published in a peer-reviewed journal. He is also contributing to a guide on research methodology for staff at CSIR Built Environment.

Asked about his plans for the future, Siphso indicates that he would like to continue his involvement in research that supports decision-making at national level. "The CSIR offers a multitude of opportunities to develop one's personal skills, and if offered the chance to stay with the organisation for the next few years, I would definitely do so." Also on the cards is a PhD, once he has completed his Master's. Children and youth in rural South Africa have clearly gained a committed champion who believes in the power of research to improve their quality of life.

- Deidre Lotter

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Science simplified: Intern's science roots blossom at CSIR

Very often the answers to the most complex of issues lie right under our noses. This is what Dikeledi Pitso discovered early on in life, and she has been inspired to find these solutions ever since.

DIKELEDI PITSO had her first encounter with mathematics at the age of two – counting daily taxi earnings for her grandfather's humble business. At the age of four, and in grade one, she had already witnessed a scientific innovation – seeing workers on the Free State farm where her mother was a teacher, cool water by simply wrapping a sack around a bucket and leaving it under a tree. “No electricity required – simply magic!” she quips, 16 years later and still impressed with mankind's ability to innovate.

Dikeledi, now 20, is an intern within the environmental and resource economics research group of the CSIR. She holds a BSc Hons in agriculture economics from the University of the Free State (UFS). “From my days as a learner at my mother's farm school, my dream has always been to have a degree incorporating science and economics,” she says. “I'm a problem solver and I thrive on the idea of contributing to others' social well-being through scientific innovations,” she adds.

The aim of her research group is to provide economically-sound solutions to environmental problems, through the application of environmental and resource economic principles and tools. The group is currently undertaking interdisciplinary research focused on integrating economics into sustainable environmental management. More particularly, the group is exploring new and exciting areas of research and has recently embarked on a new programme of research in ‘sustainability economics’, a transdisciplinary approach toward revolutionising economics so as to contribute to realising sustainable development. The group is also engaged in numerous research projects across a broad range of scientific fields including climate change, energy (particularly bio-fuels), water, biodiversity and human health.

Guided by her mentor, Dr Russell Wise, who is the research leader of the group,

Dikeledi is currently involved in a project focused on contributing to the development of a transdisciplinary environmental economics framework (sustainability economics) to support the advancement of sustainability science in South Africa. The project has adopted the development of biofuels within the energy sector as its case study.

According to Dikeledi, the ultimate objective of the research is to contribute to and support the advancement of sustainability science in South Africa, in order to ensure that development occurs in an equitable and environmentally-sustainable manner. “Further to this, the sustainability economics framework will be illustrated and tested through an application of the essential resource energy, something which is at the core of the socio-ecological system and which impacts on all facets of sustainable development.”



Dikeledi Pitso with Dr Russell Wise, her mentor

She learned about the CSIR's internship programme through the internet. The organisation's diverse research platforms caught her eye. "Where else would I have found a job that incorporates my two passions – economics and science?" she asks rhetorically.

Dikeledi will embark on her Master's studies soon. "I was ready to do it straight away, but was (fortunately) advised to gain some practical experience first," she says. "The theory is relevant, but I advocate for more practical work – applying the theory – at final-year level," she adds.

Ultimately she sees herself as an agriculture/environmental and resource economics consultant. "I will still be involved in research, as first-hand knowledge is required in advising policy-makers."

She is grateful for all the opportunities she has had in life. She credits her mother, grandfather, and the farm workers at her primary school, as the people who have had the most profound influence on her life. She also holds Dr Russell Wise in high esteem.

"I couldn't have asked for a better mentor," she says. "He values my input and gives me big challenges, which in turn afford me a chance to learn."

Dikeledi counts her internship opportunity as a blessing. "Had it not been for this job, I would have been a teller at a bank," she says, referring to a job she had accepted back in Bloemfontein upon completing her degree. "I guess I was desperate not to sit around at home waiting for opportunities."

She wishes more African students, especially girl learners, could take up maths and science at high school. "When I was in my first year, I was the only black South African woman studying towards this particular degree at the UFS, and that is sad."

"If learners can only be made aware of the science in their daily lives, and see maths at work in their surroundings, then half the battle in increasing their interest in these subjects would have been won."

When her mother once advised her to buy two shirts instead of a pair of jeans, arguing that she already had enough denim and that her budget was limited, Dikeledi didn't sulk. To the contrary, she was grateful for having learned another practical lesson. She thought to herself: "Gee, that is economics at its best!"

Nowadays, at the CSIR, Dikeledi uses her economics sense and environmental knowledge to make a real difference.

– **Lehlohonolo Mokhele**

"If learners can only be made aware of the science in their daily lives, and see maths at work in their surroundings, then half the battle of increasing their interest in these subjects would have been won."



Dikeledi Pitso and her mentor, Dr Russell Wise, discuss one of her potential MSc projects. The research will focus on comparing the financial implications of dealing with satansbos (an invasive alien plant) by letting the agents – insects (Leptinotarsa species) in particular – actively control the weed, as opposed to traditional methods, such as herbicides. The study aims to ascertain whether biocontrol, on its own, is an effective strategy for farmers to pursue. It will also demonstrate the benefit of biocontrol in crop production, especially for poor rural farmers who do not have access to herbicides