



College of Agriculture, Engineering and Science | Annual Report 2014

by Professor Deo Jaganyi



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Deputy Vice-
Chancellor and Head
of College (Acting)

The achievements of the College during 2014 can be summarised as exceptionally outstanding in all respects. The College exceeded its enrolment numbers, registering 105% of its target both in undergraduate and postgraduate. The College graduated 98 PhDs, which was 46% of the university total. Over R5 000 000 was raised to support the Access Programme.

Once again the College dominated UKZN's list of top 30 researchers by having 22 academics in that number. Academics in the College attracted significant research funding, the Food Security theme receiving R48 000 000 and the Renewable Resource Management theme getting R21 000 000. The College also recruited 172 postdoctoral scholars and supported 108 postgraduates.

Teaching and Learning

In 2014 the College celebrated another successful and productive year that saw a number of significant achievements. Starting with enrolment, the final numbers showed that the College exceeded its targets at every level both in size and shape. For undergraduates a total of 7707 students were enrolled (105% of target) a good number being registered in the Main stream, which has always been a big challenge. Honours numbers were 396 (102% of target), Masters 862 (104%) and 729 PhDs (116% of target).

An analysis of our 2014 graduation shows that the College surpassed its postgraduate throughput targets as outlined in the enrolment plan, graduating 98 PhDs (target 95) out of a university total of 211 i.e 46%, which included 8 staff members. 239 Masters (target 176) and 386 Honours (target 198) degrees were conferred. In total the College awarded degrees to 1938 students and conferred 46 diplomas.

The Land Surveying Programme was successfully accredited for the next five years by the relevant professional body PLATO. Support for our students in the Access Programme continued, with the College securing funding from Herman Bhetaver Trust (R100 000), the Industrial Development Corporation (R500 000), Nedbank (R250 000), Sasol (R1 000 000) and the Moses Kotani Institute (R3 240 000).

The College continued to invest in teaching and learning, distributing a total of R19 260 000 to schools to support both teaching and research equipment.

To improve the delivery of teaching and learning, two Schools - namely Mathematics, Statistics & Computer Science, and Agricultural, Earth & Environmental Sciences - were QPA-reviewed. The Implementation Plans of the Review recommendations are currently underway.

A number of our academics took the challenge to improve their teaching skills. A total of 107 academics attended and completed the University Education Induction Programme (UEIP) during 2014. In addition, 43 academics took part in the Teaching Portfolio workshop organised by the College.



This is the third year that the College has implemented the recruitment of Developmental Lecturers as part of its transformation strategy. To date 13 target candidates have been recruited and two have completed their PhDs and have been credentialed in to Lecturer positions.

Research

The College once again dominated UKZN's Top 30 researcher list, with 22 academics drawn from all five Schools included, illustrating the diversity of quality research occurring within the College. The top spot was retained by Director of the Research Centre for Plant Growth and Development, Professor Johannes van Staden. Second position was taken by Chemical Engineer, Professor Deresh Ramjugernath, whose Thermodynamics Research Unit is renowned for its contribution to South Africa's Fluorochemical Expansion Initiative. The top female researcher in the College was once again biologist and terrestrial vertebrate specialist, Professor Colleen Downs.

The recent UKZN internal audit review on Research Productivity showed that every School in the College exceeded its productivity target in both 2012 and 2013. The College in 2012 achieved 40.973 productivity units against a target of 28.500, whilst in 2013 the target was 28 770 and the College achieved 48 598.

Academics in the College continue to attract significant research funding of over a million per project. Under the theme Renewable Resource Management, three projects totalling R21 000 000 were funded: two Thrip biodigester food waste to energy projects, and a boil energy project in energy-poor deep rural areas. Under the Food Security theme, a number of research projects worth over R48 000 000 received funding. The UKZN Plant Breeding MSc for Africa, funded by the Alliance for a Green Revolution in Africa (AGRA) had the lion's share at approximately R28 000 000. Other projects include: ARC Collaboration Centre for Smallholder Farmer Development, GROW NUT-Growing partnership for higher education and research in nutritional epidemiology in DR Congo, Sustainable control of pre-and-postharvest of citrus fruit in South Africa and a number of Water Research Commission Projects. The theme Industrial processing and value production enhancement had one project, 'Customer Demand Driven Advanced Manufacturing Environments for Factories of the Future', funded under the NRF-Blue Sky programme to the tune of R4 000 000.

A number of research strategic initiatives were supported in 2014 using the College strategic funds. These included the appointment of 137 postdoctoral scholars at a cost of R16 400 000. In addition the College recruited 35 more postdoctoral scholars through external funding making the total of 172. A total of 49 young academics, 13 postdoctoral scholars and 76 Masters and PhD students were funded to attend a total of 33 local conferences and 61 international conferences at a cost of R1 380 000. The College also invested a total of R4 510 000 on 59 Masters and 49 PhD students, mostly Black South Africans.

To promote internationalisation, the School of Engineering signed a Memorandum of Understanding with McMaster University of Canada, formalising a valuable partnership and laying the foundation for research collaboration and student and staff exchange.

Data generated by UKZN's CIMEL sun-photometer apparatus used for monitoring to assess the quality of pollutants in the air was allocated a space on NASA's online Aerosol Robotic Network (AERONET). This ground-based sun-photometer was funded by South African National Space Agency through the School of Chemistry and Physics.

Awards and Achievements

Staff and students in the College have excelled across a number of disciplines in the five Schools, making an impact both locally and internationally. Notable awards include:

- Professor Orde Munro of the School of Chemistry and Physics won the South African Chemical Institute's (SACI) Sasol Innovator of the Year Award for his invention and patent of a novel class of anticancer drug candidates.
- Eminent Physicist, Academic and Senior Research Associate at UKZN, Emeritus Professor Manfred Hellberg, was awarded the highest honour of the South African Institute of Physics - the 2014 SAIP De Beers Gold Medal - for his outstanding contribution to the Discipline of Physics.
- Senior Lecturer in Geological Sciences in the School of Agricultural, Earth and Environmental Sciences, Dr Andrew Green, received the prestigious Emerging Scientist award from the South African Network for Coastal and Oceanic Research (SANCOR).
- Professor Mukwembi was awarded UKZN's Distinguished Teacher Award for 2014. He was also one of only five recipients in the country for a National Excellence in Teaching and Learning Award for 2014, in recognition of his inspiring approach towards teaching and championing Mathematics education.

In terms of outstanding students, Mr Lance Oom was named the best single undergraduate student and received both the LC Robinson and the Deputy Vice-Chancellor's scholarships; whilst Mr Muhammad Shoaib Ikram, Ms Jananee Padayachee, Mr Mark Chambers, Mr Nathan Sparks and Ms Zahra Essack all received Vice-Chancellor's scholarships. Ms Aadila Moola won the Pius Langa Scholarship, whilst Masters student Mr Kevin Chizoba Igwe won a Rick Turner scholarship for student leadership and community involvement. Fellow Masters student Ms Cerene Rathilall was awarded the prestigious Mandela Rhodes Scholarship. Other top achievers included Ms Candice de Boer and Ms Kimberleigh Govender. Mr Prenolan Naidoo, a Masters student, was awarded the South African Association of Engineering Geologist Student Award for 2013 for his Honours dissertation.

Our Mechanical Engineers made the College proud when iKlwa, the 2014 Solar Car built by a team of final year students and staff, finished first in the South African category and third overall in the 2014 Sasol Solar Challenge, proving once again the worth of UKZN's Engineering teaching and research.

Community Engagement and Outreach

Responsible community engagement featured prominently in the College's activities in 2014. The KwaZulu-Natal Sandstone Sourveld Research Programme, a research partnership between UKZN's School of Agricultural, Earth and Environmental Sciences (SAEES) and the School of Life Sciences (SLS), and eThekweni Municipality's Environmental Planning and Climate Protection Department (EPCPD), is currently nearing the end of its initial three-year phase. Plans are underway to continue the partnership into a second phase. The partnership is managed by Professor Mathieu Rouget's Land Use Planning and Management Research Chair and Dr Sean O'Donoghue of the Environmental Planning and Climate Protection department. This collaborative research partnership is centred on an endangered ecosystem within the eThekweni municipal area, the KwaZulu-Natal Sandstone Sourveld grassland. The research activities focus on biodiversity and climate change adaptation through local land use planning and management, in an effort to lessen the impacts of climate change and urbanisation on the area's ecosystems and its endemic biodiversity.



Another research project that relies heavily on community support is the annual Cape Parrot Big Birding Day (CPBBD), a community outreach and research project coordinated by Professor Colleen Downs and the Cape Parrot Working Group. This annual count of one of South Africa's endangered birds, which has been running since 1998, relies on community input and cooperation in terms of sighting and counting assistance, as the parrots are spread over a wide geographic area in the mistbelts of KwaZulu-Natal and the Eastern Cape. The Cape Parrot (*Poicephalus robustus*) is the only parrot species endemic to South Africa. The aim of this annual exercise is to determine their occurrence in the wild and obtain an accurate population estimate.

Finally, the College's commitment to learner education and upliftment continues unabated. Two new initiatives were launched in 2014 in conjunction with eThekwi Municipality and the Department of Education. A highly successful STEM (Science, Technology, Engineering and Maths) Career Symposium was held in April on the Edgewood Campus. This saw 2 400 grade 11 and 12 learners from 24 low quintile schools receive information on STEM career opportunities. In September, an equally successful subject information outreach campaign targeted grade 9 learners from 40 quintile 1 and 2 schools in the eThekwi area. Through fun and interactive science shows, academics and students from the College educated learners on the importance of taking core maths and physics as subject choices.

Campus Development

One of the major infrastructural achievement for the College in 2014 was the opening of the new Forensic laboratories in the School of Life Sciences on the Westville Campus. This set of unique laboratories will be used for the training of Honours students in the Genetics and Biological Sciences disciplines. It is a first for UKZN and the only facility in KwaZulu-Natal where students are able to undergo training using specialised equipment to qualify them for work in fields crying out for trained geneticists.

On the Howard College Campus, the R10 000 000 construction of Phase two of the School of Engineering /Unite building, as well as the R14 000 000 renovation of the Chemical Engineering Laboratories are on track and scheduled to be completed in 2015.

The R10 500 000 refurbishment of the Rabie Saunders building in Pietermaritzburg is likewise scheduled to be completed in 2015. The extension of the Chemistry building at a cost of R20 000 000 is at an advanced stage and construction will start soon. These projects are all DHET/UKZN funded.

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100 YEARS OF ACADEMIC EXCELLENCE

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville