



NMMU Research and Innovation Report 2013

VISION 2020

To be a dynamic African university, recognised for its leadership in generating cutting-edge knowledge for a sustainable future.

VALUES

Ubuntu

Integrity

Excellence

Respect for diversity

Taking responsibility

Respect for the natural environment

Contents

Message from the Vice-Chancellor	02
Message from the Deputy Vice-Chancellor	04
Vision 2020 Research and Innovation Plan	06
Department of Research Management	08
Department of Research Capacity Development	09
Department of Innovation Support and Technology Transfer	10
Research Overview	11
• Institutional Research Themes	11
• NRF Rated Researchers	16
• DHET Research Output Units	20
Innovation Overview	22
Research Excellence	26
• NMMU Researcher of the Year and Faculty of Science Researcher of the Year	26
• Research Excellence Awards	27
• Innovation & Technology Transfer Awards	28
• Engagement Awards	28
• Performing and Creative Arts Awards	29
• National Equipment Programme – NRF	31
• Leading research in an under-researched area: Key Populations	32
Research Chairs	33
Research Entities	43
Research Capacity Development	53
The Scholarship of Engagement	60
 Faculty of Arts	66
 Faculty of Business and Economic Sciences	72
 Faculty of Education	82
 Faculty of Engineering, the Built Environment and Information Technology	90
 Faculty of Health Sciences	98
 Faculty of Law	106
 Faculty of Science	112
Doctorates	122
Research Masters	128
Patent Applications Filed in 2013	138
Exhibitions and Performances	139
Publications	140
Research Support	162

Message from the Vice-Chancellor



Prof Derrick Swartz
Vice-Chancellor

The 2013 NMMU Annual Research Report provides the reader with a beautifully illustrated summary of some of the most significant research and innovation activities undertaken by the University during this year. Naturally, a great deal of the research and innovation activities of our research community has a multi-year duration, thus signaling important continuities whilst also highlighting some fresh initiatives underway. Over the past few years, we have been attempting to frame and promote our core research and innovation activities in the context of NMMU's Vision 2020 "as a dynamic African university recognised for its leadership in generating cutting-edge knowledge for a sustainable future".

Over the past few years, we have been attempting to frame and promote our core research and innovation activities in the context of NMMU's Vision 2020 "as a dynamic African university recognised for its leadership in generating cutting-edge knowledge for a sustainable future".

Our goal, as the Report will hopefully reflect in various ways, is to locate the research mission of the University right at the epicentre of the grand challenges facing our country almost two decades after the formal transition to democratic rule in 1994. These challenges involve, inter alia, eradicating poverty and inequality, stimulating inclusive economic growth, building wholesome communities, and creating a non-racial, democratic society. Yet, as we know, the "national question" – the idea of creating a more equal, socially just and inclusive democracy in South Africa - has to be forged in a new and changing world. Economic globalisation, population growth and resource (water, energy, land, food) pressures, cross-border mobility and the revolution in information and telecommunication technologies have presented new challenges and possibilities for advancing national goals, particularly in respect of developing societies. Moreover, we have to undertake these challenges in the context of global warming and disruptions in climate and eco-systems.

We believe that centuries of advances in human knowledge, from the earliest discoveries of science and invention of technologies have created and presented us with a mixed "balance sheet" of human "progress". Our generation has the special responsibility to take a long and self-critical look at its lessons, unintended consequences and paradoxes,

if we are to avoid making bigger mistakes. If we are to harness the insights of new science and technology – read in both social and natural senses – to create a better human society, we also have to do so in respect of our natural habitat. We have to be mindful of the Janus-faced ways in which all science and technology could be used for either perilous or sustainable pathways of development - the interplay of the “light and shadows” of science and technology in society today. We remain exceedingly hopeful that our research community can help us to achieve greater wisdom in placing our best knowledge and technologies at the service of the ideal to create a more just, inclusive, equal and ecologically sustainable world; whilst also speaking truth to the new perils posed by human actions to the natural and social world in the Anthropocene.

NMMU researchers have been producing a growing corpus of outputs across the following institutional research themes:

- Sustainable local economic development;
- Advanced manufacturing and engineering;
- Cyber citizenship;
- Health and wellbeing;
- Nanoscale characterisation and development of strategic materials;
- Democratisation, Conflict and Poverty;
- Sustainable Human Settlements;
- Humanising Pedagogies;
- Coastal, marine and shallow water ecosystems;
- Science, mathematics and technology for society;
- Earth Stewardship Science;
- Biodiversity Conservation and Restoration; and
- Strategic Energy Technologies.

The University has increased its levels of strategic investment to stimulate the rapid development in these important research domains, in order to build critical mass, depth and impact. Although capabilities are not evenly spread, we are encouraged by the growing creativity of our research leaders. In 2013, we have seen strong support for NMMU’s research community, especially emerging and next generation scholars. We have also continued with, and in some cases brought new investments into, NMMU’s research infrastructure, including laboratories, equipment, library facilities and other research resources to enrich the research environment.

In addition to NMMU’s five (5) research Chairs based in the Faculties of Education, Engineering, Built Environment and IT, and Science, NMMU’s four (4) National Research Foundation funded Chairs - in Microfluidic Biochemical Processing, Shallow Water Ecosystems, Earth Systems Science and Law of the Sea and Development in Africa – are well underway in building up a new set of research enterprises, including training of doctoral and postdoctoral students in these new branches of research.

As the Report will demonstrate, NMMU’s links with industry is probably one of our most distinctive features, as we pride ourselves in fostering

strong, vibrant, mutually beneficial linkages with the wider economy in pursuit of national development goals. Whilst our remit is broader insofar as NMMU also conducts important basic and fundamental research, we actively engage with industrial communities to ensure our students have gainful employment, are prepared for the challenges of industry, and become creative innovators in the economy. Beyond industry, as you will notice, NMMU also actively engaged with social (civic) communities, as can be seen from our growing network of linkages with, and work in, schools, social welfare and healthcare institutions, legal firms and public courts, and community-based institutions.

I would like to sincerely express my thanks and deep appreciation to the NMMU research community for their commitment and passion in making a difference in the lives of communities blighted by poverty, unemployment, lack of economic opportunities and helping to do so in a socially and ecologically-sustainable manner. We are hugely encouraged by their contributions. My sincere thanks to the exceptional leadership of Professor Thoko Mayekiso, Deputy Vice-Chancellor: Research and Engagement, and her colleagues for making all this possible.

Derrick Swartz
Vice-Chancellor

Message from the Deputy Vice-Chancellor: Research and Engagement



Prof Thoko Mayekiso
Deputy Vice-Chancellor:
Research and Engagement

Research and Innovation activities at Nelson Mandela Metropolitan University in 2013 were characterised by attempts to embed a collaborative research and scholarship culture. As a result, a number of strategies were implemented to foster and enhance inter-multi-trans-cross-disciplinarity. The institutional research themes are increasingly being considered as one of the important avenues for collaborative research across the natural and social sciences. Important strides were made in this regard in 2013. At this stage, the collaboration was on setting the research agenda for each theme and embarking on research and scholarship projects. It is anticipated that in future, collaborative research outputs at NMMU will be produced involving researchers across a wide range of disciplines/professions.

One highlight in 2013 was the establishment of the AEON-NMMU Earth Stewardship Science Institute as a University-wide research institute to generate cutting-edge research and scholarship of humanity's effect on the planet.

One highlight in 2013 was the establishment of the AEON-NMMU Earth Stewardship Science Institute as a University-wide research institute to generate cutting-edge research and scholarship of humanity's effect on the planet. This will be done through the exploration of the need to differentiate between natural and anthropogenic changes in Earth-Life-Health Systems to address man-made global changes.

Our focus in 2013 was on deepening, through research and scholarship the integration of teaching and learning, research and engagement. As a result, there have been encouraging developments in relation to the Scholarship of Teaching and Learning, as well as the Scholarship of Engagement and what is increasingly considered as a socially engaged research.

Another strategy that was successfully implemented in 2013 was to use our international partnerships to enhance both the quantity and the quality of the research outputs. In line with this strategy, the Centre for High Resolution Electron Microscopy, one of the flagship programmes of the University, established a number of international partnerships in energy materials, novel materials and minerals beneficiation. These have contributed to the improvement of the impact of research outputs.

Another strategy that was successfully implemented in 2013 was to use our international partnerships to enhance both the quantity and the quality of the research outputs.

Nationally, we continued to build our research and scholarship on partnerships/collaboration that have been established with industry, science councils and government, Non-Governmental Organisations and other higher education institutions. This has provided us with a framework to conduct research that is responsive, relevant and addressing national priorities.

The NMMU continued to enhance South Africa's knowledge generation in order to produce world-class research outputs and translate advanced findings into products and processes.

Our commitment towards building the next generation of academics and researchers yielded the results we had targeted in 2013.

As a result, the number of staff with doctoral degrees (40.6%) continues to improve and is currently above the national norm of 38%.

On behalf of the Research Office, I would like to extend to the NMMU community our heartfelt gratitude for the support provided to us during 2013.

Prof Thoko Mayekiso

Deputy Vice-Chancellor: Research and Engagement

Vision 2020 Research and Innovation Plan



Strategic Priority:

To create and sustain an environment that encourages, supports and rewards a vibrant research, scholarship and innovation culture.

Strategic Goal 1:

To promote research and innovation, which contributes to local, regional, national and global sustainability.

Strategic Objectives

- 1.1 To establish and expand research and innovation partnerships, collaborations, networks and linkages nationally and internationally.
- 1.2 To identify and develop institutional research themes.
- 1.3 To promote the commercialisation of research outcomes in the form of products, processes and services.

Strategic Goal 2:

To create and support an environment that fosters research quality and productivity.

Strategic Objectives

- 2.1 To provide an enabling policy and funding framework to improve research quality and productivity.
- 2.2 To increase and diversify external and internal financial resources available to support research-related activities.
- 2.3 To provide appropriate research and innovation infrastructure and support.
- 2.4 To promote, recognise and reward research and innovation excellence.

Strategic Goal 3:

To develop and sustain the research capacity of staff and students.

Strategic Objectives

- 3.1 To attract, nurture and develop research potential.
- 3.2 To attract and retain research talent.
- 3.3 To provide support to emerging researchers, postgraduate students and postdoctoral fellows to become research active.
- 3.4 To create a culture of research in undergraduate students.
- 3.5 To enhance and improve the equity, gender and age profile of researchers.

Strategic Goal 4:

To promote a broad conceptualisation of research, scholarship and innovation.

Strategic Objectives

- 4.1 To enhance and foster the scholarships of teaching, learning and engagement.
- 4.2 To enhance and promote research responsiveness.

Department of Research Management



Dr Pieter van Breda
*Director: Department of
Research Management*

The core functions of the Department of Research Management are: to support established researchers; to develop, implement and manage research information management systems; to reward through incentives staff members who produce research outputs and; to provide strategic support to inter alia institutional research themes, research chairs and entities.

Vision 2020 aims to maximise NMMU's human capital potential, and research sabbatical is seen as a unique opportunity for self-development, to further enhance careers and to produce research, which supports University research priorities and strategy, specifically to improve research outputs and the qualification profile of staff. During 2013, a large number of staff members were granted research sabbaticals and in almost all instances the outputs indicated in the sabbatical leave plans were met.

A new policy on the division of DHET research output subsidy generated through research publications was approved and implemented. The purpose of the new policy is inter alia to increase the number and quality of DHET subsidy generating research publications, to ensure that the University performs consistently above the DHET research output norm set for NMMU, and to encourage staff members to publish their research in subsidy earning publications. In terms of the new policy, 27% of the Rand value of a DHET research output unit is allocated to researchers to sustain their research activities and 10% to Faculty RTI Committees to drive their research agendas in support of the faculties' strategic plans. A further 3% is earmarked to assist emerging researchers with research-related costs as well as conference attendance.

During 2013, a driver for each of the 13 NMMU Institutional Research Themes was identified and six themes were formally launched. Faculties have begun the process of identifying sub-themes. This is an extremely important exercise for the NMMU as the institutional research themes, underpinned by research chairs and entities, are seen as one of the key elements to give effect to NMMU's research strategy.

Established researchers managed to further enhance their national and international standing through research collaborations, successful NRF rating and re-evaluation applications and the publication of research findings. It is encouraging to note that there is a gradual shift from publishing in low impact journals to publishing in those with a higher impact. Linked to this, the 86 doctoral students who completed their studies in 2013 submitted 169 articles to journals of which 98 were accepted for publication.

Department of Research Capacity Development



Dr Blanche Pretorius
*Director: Department of Research
Capacity Development*

The National Development Plan (NDP) Vision for 2030 states: “(W)hile knowledge production is the rationale of higher education, high-quality knowledge production cannot be fully realised with a low student participation rate, a curriculum or environment that is alienating and does not articulate the vision of the nation, and an academic staff that is insufficiently qualified (only 34% of academic staff hold PhDs)”. Universities are continuously under pressure to grow their student enrolment rates in response to the country’s human resource needs whilst growing the next generation of academics who will not only become excellent researchers, but use this disciplinary knowledge creatively to inform their teaching. Investing in emerging researchers is vital within higher education given the aging profile of the professoriate as well as the imperative to transform the sector and ensure increased participation by women and to ensure equity.

Investing in emerging researchers is vital within higher education given the aging profile of the professoriate as well as the imperative to transform the sector and ensure increased participation by women and to ensure equity.

The sentiments expressed in the NDP provide the *raison d'être* for a professional support unit such as the Department of Research Capacity Development and encapsulate the main focus areas during the period under review, namely:

- Supporting postgraduate students through providing access to funding and offering a capacity development programme of workshops that aim to build an enabling environment.
- Facilitating opportunities for the NMMU’s academic staff to improve their qualifications and creating an enabling environment for emerging researchers to access funding opportunities for their research endeavours both internally and externally.

A strategic priority of the institution remains the need to increase its postgraduate enrolments and to ensure that the NMMU makes a meaningful contribution to increasing the human resource capacity within the national research and development system.

Department of Innovation Support and Technology Transfer



Ms Jacqueline Barnett
*Director: Department of
 Innovation Support and
 Technology Transfer*

The Department of Innovation Support and Technology Transfer is responsible for the protection and management of intellectual property owned by the NMMU through the core activities of attracting and assessing innovation disclosures as well as patenting and other forms of Intellectual Property protection. Where appropriate, intellectual property is assigned or licensed to a wholly-owned company of NMMU, Innovolve (Pty) Ltd, that undertakes commercialisation activities such as licensing and spin-out company formation. The Department also facilitates and negotiates external, research-related grants and contracts with a specific emphasis on intellectual property ownership issues.

In 2013, the NMMU continued to drive the late stage research and development of a number of significant innovations based on NMMU-owned intellectual property.

In 2013, the NMMU continued to drive the late stage research and development of a number of significant innovations based on NMMU-owned intellectual property. Many of the projects reported on are multi-year projects and take what may appear to be only incremental steps towards commercialisation each year. However, commercial plans are usually made while research is being completed, so commercialisation moves slowly even while the research is gathering momentum. Many of our projects are at a scale not normally tackled at universities and require new ways of thinking about our role as a university in this new innovation-led world.

NMMU has continued to play a role locally, regionally and nationally. In 2013, NMMU approved the establishment of an incubator, which will add significant value to the local economy and assist in fast-tracking our innovations. The Regional Innovation Forum has continued bringing research, industry and government together in the Nelson Mandela Bay and Cacadu District Municipalities. NMMU staff continued to play a major role in the Southern African Research and Innovation Management Association, the national association for research and innovation management leadership. Internationally, the Department's staff are playing a role in the professionalisation of technology transfer through work in the Alliance of Technology Transfer Professionals, a global association of leading technology transfer bodies from numerous countries.

The NMMU understands that technology transfer is a long-term activity that has the potential to provide significant societal benefit. We continue to make investments in developing capacity to drive the activities and to ensure our intellectual property is protected. We also attempt to make a difference across our country by developing capacity at other institutions to ensure that the fruits of research can be realised.

Research Overview



Institutional Research Themes

NMMU continues to make significant progress in its drive to create an environment that encourages and rewards research excellence, with the aim of improving the University's research profile.

Cyber Citizenship

The Institutional Research Theme of Cyber Citizenship was officially launched on 6 September 2013. The launch took place during a workshop titled: "The Cyber World of 2025 – a Future Dialogue". Pieter Geldenhuys, a futurist and expert in innovation and technology strategy, set the scene as main speaker. He provided a virtual glimpse of what cyber citizenship might entail in 2015. This futuristic sketch of the cyber world of 2015 was contextualized from an ethical, philosophical, legal, psychological, business, educational, and technological point of view by various subject experts. From subsequent discussions it was debated that cyber citizenship of the future will have to harmonise and balance what is technologically possible with what is ethically, philosophically and psychologically acceptable and good for mankind and also legally enforceable.

A number of projects addressing psychological aspects relating to cyber citizenship are underway. These projects address, amongst others, aspects related to: cyber-bullying, online-dating, online infidelity and the "cyberself". Cyber security is also well researched. A number of research projects related to cyber awareness and education are underway and similarly projects addressing the governance of cyber security. From a legal point of view, cyber-bullying and online banking security is being addressed. A number of research outputs in the form of journal and conference papers were generated during the year. As discussions and research continue in the domain of cyber citizenship, the intrigues and effects of the cyber world unfold and are addressed to the benefit of mankind.

Strategic Energy Technologies

Fossil fuels played a major role in the development of most industrial nations and much of the infrastructure developed is reliant upon this resource. In fact, the civilised world relies almost completely on fossil fuels for just about all aspects

of its existence – but these energy supplies are under threat. They are a finite resource – and will one day run out or become too expensive to use. For this reason – and the fact that fossil fuel emissions contribute to climate change and pollute land, sea and air – the race towards renewable energy alternatives has become critical. The world needs to secure a supply of reliable and affordable energy – and also effect a transformation to a low- or non-carbon, efficient and environmentally-friendly system of energy supply. NMMU researchers working under the Strategic Energy Technologies theme are determined to embrace this challenge – and, in so doing, help develop the local energy supply capacity for the Eastern Cape, while lessening the contribution of greenhouse gas emissions from the Province.

The theme provides a wide range of study opportunities in each of these areas and a comprehensive platform to support specialised, multi-disciplinary training in strategic energy fields, engaging with government, industry and other stakeholders for maximum possible impact. An Advanced Diploma in Renewable Energy is also being developed. Key research under the theme includes ground-breaking algae-to-energy technology, which could turn wasted coal dust into high quality clean coal along with a bio-oil blend for transport fuels.

Solar energy and wind energy are now tied to the campus grid – and both forms of energy have also been harnessed to develop a hybrid street light (the Twerly™), which has been commercialised. Other innovative research projects include a solar cooker, photovoltaic tracking (resulting in a greater energy yield over fixed photovoltaic panels), NMMU-patented segmented blade turbines for wind and hydro power, and the storage of solar thermal energy in a rock thermal battery. NMMU boasts its own photovoltaic testing lab (PVTl) to train students and serve the local photovoltaic industry, which houses cutting-edge equipment, including an outdoor electroluminescence (EL) imaging camera that also enables on-site photovoltaic testing. Researchers are also developing a large area light-beam induced current (LA-LBIC) mapping system for use on thin-film photovoltaic modules, to map electrical activity and provide electrical and material properties of the module.

NMMU boasts the country's second battery testing laboratory (the other is at the South African Bureau of Standards (SABS)). This laboratory is linked to the University's Uyilo e-mobility programme (a government initiative, through its Technology Innovation Agency (TIA)). In addition to conducting standard and specialised lab-based battery testing, the laboratory, in collaboration with the automotive industry, will be conducting research on the advanced lead acid batteries used in vehicle "start-stop applications", which is in line with international requirements for reducing CO₂ emissions. Research on energy statistics (i.e. resource and energy forecasting) and energy economics (i.e. energy demand and supply and the policies governing these) are a separate, but integral, part of the Strategic Energy Technologies theme.

Advanced Manufacturing and Engineering

The Advanced Manufacturing and Engineering theme are aligned with the strategic goals of NMMU's Vision 2020. This is achieved by promoting collaboration and sharing of resources between multiple departments on an inter-faculty basis. This approach allows for innovative solutions in the field of engineering, manufacturing and technology development, supporting human resources development, knowledge generation/transfer and commercialisation. The Advanced Manufacturing and Engineering theme supports: Automotive

Engineering, Assembly Processes, Friction Processing as a joining and repair technique, Production Optimisation (Lean Manufacturing), Renewable Energy (wind and ocean) exploring off-grid applications and technologies, Supplier Development for the broader engineering and manufacturing industries (support export readiness, job creation) and High Precision Fabrication for medical applications. During 2013, the theme has published a number of journal articles and conference papers to both local and international audiences. Postgraduate research projects concluded in 2013 ensured that twelve Masters and three PhD candidates graduated.

Engineering and advanced manufacturing underpins much of South Africa's economy and holds great potential for job creation and social upliftment. Through this theme South Africa's advance manufacturing industry has access to world-class research facilities aligned with creating a sustainable engineering environment that encourages skills development and nurturing a culture of engineering innovation.

Nanoscale materials characterisation, new materials and processes

The NMMU Faculty of Science houses world-class nano- and micro-scale materials characterisation facilities including the state-of-the-art Centre for High Resolution Transmission Electron Microscopy (CHRTEM). This research theme focuses on nano-scale materials characterisation and its application in the development of new materials and processes, and has sub-themes in physics, chemistry, botany and microbiology. Activities cover both fundamental and applied research, and boast a number of interdisciplinary research projects aimed at solving problems in the pertinent and diverse fields of medicine, minerals beneficiation and environmental management.

Nanoscale physics at NMMU focuses on two sub-themes; namely, nanophotonics and materials development led by Prof JR Botha (SARChI Chair: Nanophotonics) and Prof Jan Neethling (Director: CHRTEM) respectively. Besides providing facilities to the broader scientific community, the CHRTEM has a vibrant research programme focusing on the application of high resolution and analytical electron microscopy techniques in the characterisation of strategic materials in collaboration with local and international leaders in physics, materials science and engineering. The year under review was an exciting year for the CHRTEM with publications in high-impact factor journals, and successful local and international collaborations. Collaboration with the Idaho National Laboratory in the USA led to the discovery of the mechanism through which radioactive metallic fission products escape from the barrier coating surrounding nuclear fuel particles. This radioactive release mechanism has been a mystery for about 36 years. Collaboration was also initiated between the CHRTEM and the Department of Materials Science and Engineering at the Ohio State University in the USA. The focus of the collaboration will be advanced electron microscopy techniques, materials modeling and titanium alloys with the intention of developing the country's knowledge base and enhancing minerals beneficiation in South Africa.

Biological microscopy at NMMU saw a boost in 2013. The Botany Department (Prof Eileen Campbell), in collaboration the CHRTEM (Prof Mike Lee), assisted Dr Thomas Bornman from the South African Environmental Observation Network (SAEON) with the development of a diatom atlas. This work provides important

climate change indicator data, and is expected to continue in 2014. From the Department of Microbiology, an environmentally-friendly war has been waged against the false codling moth, one of the country's main citrus pests. Mr Patrick Mwanza, an MSc student from the Department of Microbiology and Biochemistry (supervisor: Dr Gill Dealtry) used the high resolution microscopes at the CHRTEM (co-supervisor: Prof Mike Lee) to improve existing bio-pesticide technology, with the goal of providing citrus farmers with a viable environmentally-friendly alternative to conventional pesticides. A postdoctoral researcher, Dr M Oosthuysen (supervisor: Dr Gill Dealtry), has been developing novel techniques using the atomic force microscope (managed by Prof JR Botha) to analyse cell surface changes associated with the adherence of human immune cells to a solid surface. This reflects changes occurring naturally when immune cells circulating in the blood enter inflamed and infected tissues. The development of medical microscopy at NMMU is on the cards for 2014 in a collaboration between the CHRTEM and Prof Saartjie Roux from the Department of Microbiology and Biochemistry.

The Department of Chemistry continued their work in the thermal stability analysis of TETROL and its pyridine and methylpyridine inclusion complexes (Dr Benita Barton), and in the development of functionalised polymeric nanofiber materials for the separation of platinum group metals (Prof Zeni Tshentu). Collaboration with Lonmin was initiated in 2013 and a small scale collaborative research project is due to start in 2014. Work on separation processes is to be expanded in 2015 to focus on urban mining of precious metals.

Health and Wellbeing

The Institutional Research Theme, "Health and Wellbeing", covers a spectrum of relevant areas that are of strategic importance. Various sub-themes have been identified, including the prevention, management and care of chronic and lifestyle diseases; HIV and AIDS; communicable diseases other than HIV and AIDS; community focussed healthcare; eHealth; health education; pharmacoepidemiology; drug design and development/ industrial pharmacy; and traditional medicine. The sub-themes are not mutually exclusive, and overlap takes place since most of the sub-themes are of a multi- or interdisciplinary nature.

A series of workshops and meetings took place during 2013 as part of developing the research theme. A workshop was presented in May 2013 by Dr Nolunkcwe Bomela on how to write a successful grant application. This was followed by a Health and Wellbeing Colloquium and Panel Discussion, which was attended by participants from NMMU and various stakeholder organisations. The Colloquium started with ten short presentations by researchers to give an overview of possible sub-themes under the main theme "Health and Wellbeing". The presenters were: Dr Ben Somai, Prof Maryna van de Venter, Prof Mark Watson, Prof Ilse Truter, Prof Rosa du Randt, Dr Jill von der Marwitz, Prof Naydene de Lange, Prof Darelle van Greunen, Dr Henri Maarschalk, and Prof Essie Ricks. Thereafter, an open discussion and brainstorming session followed and ideas were generated on how the theme should be developed to be both relevant to the community whilst also strengthening its academic research endeavours. During June 2013, Dr Blanche Pretorius presented a workshop on NRF Thuthuka grant applications (the process, the pitfalls and how to write a successful Thuthuka proposal). Dr Pieter van Breda gave an insight into how Thuthuka proposals are evaluated from the perspective of an NRF reviewer.

The Health and Wellbeing theme spans across disciplines and faculties, and strongly encourages collaborative research. The research conducted as part of the theme is of strategic importance to South Africa, and especially to the Eastern Cape. As the health-care landscape in South Africa is transformed, it is believed that the research conducted under this theme will positively contribute to achieving better health and wellbeing outcomes for all.

Science, Mathematics and Technology Education for Society

Some projects around the NMMU institutional research theme on SMTE for Society were concluded during 2013, while others were conceived anew. These new projects continued to focus on the "Big Questions" clustered around issues of access, relevance, and deeper understanding related to science, mathematics and technology education at the institution. The study on the effect of using Geographical Information Systems on the promotion of spatial cognition, spatial perspective and problem-solving drew to a successful conclusion and Ms Wilma Britz of Geosciences was awarded her doctorate at the April 2014 graduation ceremony. A paper on the topic has been submitted to the South African Journal of Geography. Research on language issues and the teaching of Pharmacology was brought to finalisation with the submission and acceptance of an article on the relationship between student achievement and general health vocabulary in the *American Journal of Pharmaceutical Education*. A new project in Pharmacy on the parameters relating to academic success in the Bachelor of Pharmacy technical support programmes was initiated by Dr Shirley Anne Boschmans. Ethical approval for the project, which is financially supported by NMMU, was attained in late 2013 and pre-tertiary performance baseline data has been generated for comparison with first-year academic performance.

Work on brain compatible blended learning for computer logic by Johan van Niekerk has continued in the Information Technology Department and a new project on developing an online writing heuristic for mechanical first-year engineering students was initiated. This project, which is also part of a ROUTE entity initiative spearheaded by the head of the Department of Mechanical Engineering (Prof Hannelie Lombard), is also supported financially under the NMMU institutional research theme. The project was designed in 2013 for investigation in 2014 in part as a Master's degree in Education study by Kholisa Papu.

Sustainable Human Settlements

The Institutional Theme on Sustainable Human Settlements is an interdisciplinary effort that is investigating antecedents for transformation towards sustainable and environmentally-friendly cities. The effort straddles the built, social, economic, institutional, and natural environments. Research projects under the theme range from urbanism, livelihoods, through to infrastructure design and development, maintenance, and settlement governance.

Progress in this Institutional Theme in 2013, includes: the launch of the Chair in Education in Human Settlements by the then Minister of Human Settlements, Mr Tokyo Sexwale; development of the curriculum for the new Bachelor of Human Settlement Development degree to be offered from 2014 and the completion of the Seaview Sustainable Settlement Pilot Project (SSPP). The SSPP included construction of the Demonstration Unit, which was carried out during the Construction Day that took place in

September in Zwelidanga settlement in Seaview. A report on the Construction Day was completed and distributed to stakeholders.

There was a considerable level of research undertaken at Masters and Doctoral level within the theme. Successfully completed Masters and Doctoral projects include: The training of artisans for house building projects; problems experienced by project managers on housing projects; waste management: the case of construction and demolition waste; architectural design interventions toward improvement of construction health, safety and ergonomics; non-payment of residential property rates; the role of development finance institutions in building small emerging enterprises for property development; management of capital expenditure programmes and possible futures for the built environment as we go towards 2050. There is ongoing research in the theme in the areas of informal settlement development and service delivery protests; and Social Housing and sustainable settlements and low-cost housing provision. A number of journal papers, including the seminal "Jobs versus Livelihoods: Sustainable settlements within the transition paradigm" in *Human Settlements Review 1*, 2013, by Professor Janet Cherry, were also published under the theme.

Sustainable Local Economic Development

The Sustainable Local Economic Development Institutional Research Theme has six sub-themes namely: entrepreneurship, SMMEs and family businesses, local economic development, tourism, automobile industry and manufacturing, sustainability and ethics and social responsibility. The Unit for Applied Management Sciences and Family Business Unit resort under this theme. During 2013, a total of 30 international and national conferences were presented and 22 journal articles were published within this research theme. A total of 24 postgraduate studies have been completed within the six sub-themes: seven Masters, two Doctoral degrees, six MBA dissertations and nine BCom Honours treatises.

Earth Stewardship Science



Prof Maarten de Wit (right), who heads up Nelson Mandela Metropolitan University's Earth Stewardship Science Research Institute (ESSRI), shows a sample of shale rock to Eastern Cape Economic Development, Environmental Affairs and Tourism's, Honourable MEC Mcebisi Jonas.

AEON - Earth Stewardship Science Research Institute provides a trans-faculty, university-wide research and educational environment to seek consilient knowledge and engagement amongst earth and life sciences, engineering,

resource economics, human and cultural sciences through application, and dissemination of Earth Stewardship Science. A TopoAfrica Workshop jointly organised by AEON and Université de Rennes 1 (France) was held at the NMMU Saasveld Campus in George, 20-25 January 2013. TopoAfrica is a project for the reconstruction and quantification of the past topography of Africa over the last 250 million years. A key focus of the project is the reconstruction of the past topography of Africa (with spatial dimensions of 500km or more) through numerical models using geo-referenced multiple datasets coupling geology with sediment production and transport. The workshop brought together international experts in Earth Systems Science fields ranging from mantle dynamics to surface (physical/chemical) processes, sea level change, biodiversity, and geocodynamics. The workshop was attended by 50 delegates from France, Germany, USA, and RSA.

The Karoo Shale Gas is a research programme developed by AEON-ESSRI and initially proposed to the Eastern Cape Government in April 2013. The funding requested totals R16 million including a capital cost of R12 million, and aims at enabling NMMU researchers to undertake *Technical Evaluation and Socio-Economic Analyses of Shale Gas in the Eastern Cape*. This would in turn provide the Government with an independent scientific monitoring capability (through ESSRI Baseline studies) in framing its policy and strategic approaches to the massive potential development associated with the prospective resource that is Shale Gas. A dedicated Karoo Shale Gas website, www.karooshalegas.org, was setup in February 2013. During October-December, Prof de Wit spent research and development time at MIT in the USA to engage with the Terrascope programme and consolidate an exchange visit with MIT students to NMMU to be undertaken in 2014. He also visited shale gas fracking and production sites around Pittsburg, Pennsylvania, as well as discussions with technical and management staff at Halliburton. This has resulted in first-hand knowledge of the shale gas industry. Prof de Wit continues to advise the CEO of International Continental Drilling Programme (ICDP) based in Germany about future projects, and in November 2013 attended the decadal planning conference at GFZ Potsdam. A final report will emerge in 2014. He was also appointed to the Council of the American Geophysical Union, the world's largest geoscience society; specifically to partake in the AGU Task Force for future scientific trends.

The concept of Airborne Geophysics Observatory (AGEO) was developed as an enabling vehicle to track earth and human resources, ecosystems and the built environment. It is based on a collaboration between AEON-ESSRI, AEON's technology hub (EarthTECH, located at the Tshwane University of Technology from where observation networks particularly in airborne geophysics, seismology and magnetotellurics are being developed), and GyroLAG - an airborne service provider. The research and development collaboration between AEON at NMMU and GyroLAG has been formalised through a Memorandum of Understanding. AGEO was presented at the 13th SAGA Biennial Conference & Exhibition, Kruger Park, under the title: "Airborne Geophysics Observatory for Research and Monitoring: Coastal Ecosystems, Earth Resources, Built Environment". Africa Alive corridors aim to narrate a geological-biological-cultural story of Africa with everyone as co-custodians of over four billion years of unmatched irreplaceable heritage – in essence an autobiography of the continent told along 20 corridors.

Democratisation, Conflict and Poverty

Scholars from various disciplines and sub-disciplines are engaged with research projects around the complex challenges encapsulated in the theme, Democratisation, Conflict and Poverty. The Faculties of Arts, Law, Business and Economic Sciences and the Raymond Mhlaba Institute, the Centre for

the Advancement of Non-Racialism (CANRAD), and the Unit for Economic Development and Tourism, are some of the faculties and entities working in the various sub-themes. Research grapples with issues relating to nation-building, non-racialism and democratic consolidation in fragile, post-conflict societies with an emphasis on South Africa as well as the African continent. The NMMU is unique in producing postgraduate students who conduct focused research into conflict resolution, deep-rooted conflict in Africa and post-conflict reconstruction and development. There is now a hub of conflict-related research emerging with a community of scholars from South Africa and other African countries who are collaborating and publishing together. The new Department of Political and Conflict Studies situated in the School of Governmental and Social Sciences will further strengthen and consolidate this institutional theme and place NMMU at the forefront of this important research area.

Humanising Pedagogies

Research into issues of pedagogical orientations across departments and faculties such as, humanising pedagogy as embedded practices; curriculum renewal and the regeneration of intellectual cultures; research and professional cultures; social dynamics and institutional culture; development of pedagogical topographies; exploration into humanising pedagogy in post-apartheid South Africa; humanising leadership and; the meaning of a humanising pedagogy in practice and theory provides numerous opportunities for multi-trans and interdisciplinary research possibilities including collaborations.

Coastal, Marine and Shallow Water Ecosystems

The past year was a special one for Coastal, Marine and Shallow Water Ecosystems Research at NMMU. It (2013) marked the 75th anniversary of the discovery of the famed coelacanth and our team of researchers celebrated this event by publishing papers on a range of topics relating particularly to Algoa Bay. These included physical oceanography studies on upwelling and water circulation in the Bay, biological oceanography on fish, zooplankton, phytoplankton, as well as studies on coastal habitats such as sandy beaches and estuaries. At the end of the year, our researchers were lucky enough to be in a position to study the occurrence and impact of the first recorded toxic red tide along the southern and Eastern Cape coasts. We had been collecting baseline data for 40 months before this, which will prove invaluable in helping to understand the red tide. This event is likely to have ongoing implications for many years to come. The approval of a PhD in Oceanography during the year opened the way for a resurgence of Physical and Biological Oceanography research at NMMU in a multi- and interdisciplinary way not previously possible. The signing of a Memorandum of Understanding between NMMU and the South African Environmental Observation Network (SAEON, NRF), as well as the South African Institute for Aquatic Biodiversity (SAIAB, NRF) has important implications for coastal, marine and shallow water ecosystems research at NMMU and represents the “start of a new era of coastal and marine research in the Eastern Cape and South Africa” (as reported by the *Financial Mail Essentials*).

Biodiversity Conservation and Restoration

This theme reflects two major aspects of the natural environment in which the NMMU operates, both of which represent strategic research and training opportunities. The first aspect is the fact that NMMU is geographically located

in one of the most biodiverse areas globally, in both the marine and terrestrial contexts. Thus, two major marine biogeographical provinces about each other in the vicinity of the NMMU, together with a large number of estuarine systems in this area. In addition, the coastal zone in the proximity of the NMMU is extremely diverse. From the terrestrial perspective, the NMMU hinterland represents the only place in the world where three global biodiversity hotspots (representing nearly 10% of such hotspots globally) meet. In addition, at the biome level, the Eastern Cape Province is the most diverse province in South Africa. The proximity of a number of “big 5” national parks and reserves is unsurpassed anywhere else in the world. This wealth of biodiversity provides exciting opportunities for research and training, and also requires considerable knowledge and understanding if it is to be properly and sustainably managed. The second aspect relates to the fact that much of the natural environment in which NMMU is located has been modified to a greater or lesser extent by anthropogenic activities, and there is a considerable need to restore transformed and degraded systems. This restoration is aimed at both conserving and maintaining biodiversity, as well as better managing natural ecosystems for the benefit of human populations. This restoration must be based on robust science and requires considerable research to identify the best practices. There is also a substantial need for well-trained expertise to implement such practices. This theme also contributes to the NMMU’s commitment to serving the African continent, as many of the challenges and education needs across Africa includes aspects of biodiversity conservation and restoration, and ultimately the sustainable use of natural ecosystems. The theme also reflects the values of NMMU, particularly in terms of respect for the environment and taking responsibility.

There are a number of subthemes within which the larger theme is addressed, and these include:

- Conservation Biology • Animal-Plant Interactions • Resource Ecology
- Ecophysiology • Predator Prey Interactions • Transformation and Restoration Ecology • Resource Economics • Biodiversity
- Climate Change.

The Biodiversity Conservation and Restoration theme received direct institutional support from NMMU in 2013, through funding support provided to three research projects, which were identified as being relevant to this theme. A further two projects under the “Coastal Marine and Shallow Water Ecosystems” also dealt with biodiversity. This, however, reflects only a small portion of the research and postgraduate training that is relevant to this theme and that are being undertaken at NMMU, given the relevant research outputs reflected below. During 2013, 51 papers reporting (based on their titles) on research covered under the Biodiversity Conservation and Restoration theme were published by academics, researchers and staff at NMMU. This represents 25% of the papers published under the auspices of NMMU in 2013. These papers encompassed studies on a range of aspects relating to biodiversity, including conservation biology, restoration, animal-plant interactions, resource ecology, ecophysiology and climate change. The species dealt with in these studies ranged from birds (southern red bishops, Cape gannets), lizards and frogs to large herbivores such as black rhinos, African elephants, buffalo, Cape mountain zebras and sea turtles, including mesopredators (black backed jackal) and apex predators (lion and the great white shark). Research reported in these papers was conducted in a variety of freshwater, marine and terrestrial ecosystems, highlighting the unique fauna and flora found within South Africa and the importance of these ecosystems in maintaining biodiversity.

NRF Rated Researchers

Total number of NRF Rated Researchers at NMMU (2011 – 2013)

2011	66
2012	72
2013	73

Number of Rated Researchers per Rating Category (2011 – 2013)

RATING CATEGORY	2011	2012	2013
A1	2	2	2
A2	0	0	0
B1	0	1	1
B2	2	2	2
B3	5	4	4
C1	11	12	12
C2	18	23	26
C3	19	21	21
Y1	0	0	0
Y2	4	4	5
L	5	3	0
Total	66	72	73

Number of Rated Researchers per Faculty/Division (2013)

FACULTY	A	B	C	Y	Total
Arts			5	1	6
Business and Economic Sciences			5		5
Education			3		3
Engineering, the Built Environment and Information Technology (EBEIT)		2	11	1	14
Health Sciences		1	1		2
Law			2		2
Science	2	4	27	3	36
Support Services			5		5
Total	2	7	59	5	73

Rated Researchers

NAME	RATING	FACULTY/DIVISION	DISCIPLINE
Cowling, RM, Prof	A1	Science	Botany
De Wit, M, Prof	A1	Science	Geology
Watson, MB, Prof	B1	Health Sciences	Psychology
Branch, B, Dr	B2	Science	Zoology
Christopher, AJ, Prof	B2	Science	Geography
Kotze, P, Prof	B3	EBEIT	Information Technology
Perissinotto, R, Prof	B3	Science	Marine Biology
Roux, D, Dr	B3	Science	Ecology
Von Solms, R, Prof	B3	EBEIT	Information Technology
Adams, JB, Prof	C1	Science	Botany
Anandjiwala, R, Dr	C1	Science	Textile Science
Downing, TG, Prof	C1	Science	Biochemistry
France-Jackson, H, Prof	C1	Science	Mathematics
Gerber, TIA, Prof	C1	Science	Chemistry
Groenewald, NJ, Prof	C1	Science	Mathematics
Hattingh, DG, Prof	C1	EBEIT	Mechanical Engineering
Kerley, GIH, Prof	C1	Science	Zoology
Olivier, B, Prof	C1	Arts	Philosophy
Stretch, RA, Dr	C1	Sport Bureau	Sport Science
Vrancken, PHG, Prof	C1	Law	Public Law
Wagener, MC, Prof	C1	Science	Physics
Booth, GL, Prof	C2	Science	Mathematics
Botha, JR, Prof	C2	Science	Physics
Burgess, S, Prof	C2	Business and Economic Sciences	Business Administration
De Lange, N, Prof	C2	Education	HIV/Aids Education
Engelbrecht, JAA, Prof	C2	Science	Physics
Fabricius, C, Prof	C2	Science	Ecology

Rated Researchers			
NAME	RATING	FACULTY/ DIVISION	DISCIPLINE
Foxcroft, CD, Prof	C2	HEADS	Psychology
Gibbon, T, Prof	C2	Science	Physics
Govindjee, A, Prof	C2	Law	Law
Hurst, A, Prof	C2	Arts	Philosophy
Janse van Vuuren, HE, Prof	C2	Arts	Literature
John, PH, Dr	C2	Arts	Literature
Kakembo, V, Prof	C2	Science	Geosciences
Kotze, EF, Prof	C2	Arts	Literature
Leitch, AWR, Prof	C2	Science	Physics
Neethling, JH, Prof	C2	Science	Physics
Phaswana-Mafuya, R, Prof	C2	Research and Engagement	Social Work
Pistorius, PA, Prof	C2	Science	Zoology
Smallwood, JJ, Prof	C2	EBEIT	Construction Management
Strydom, NA, Dr	C2	Science	Zoology
Truter, I, Prof	C2	Health Sciences	Pharmacy
Van de Venter, M, Prof	C2	Science	Biochemistry
Van Dyk, EE, Prof	C2	Science	Physics
Van Greunen, D, Prof	C2	EBEIT	Information Technology
Van Niekerk, J, Prof	C2	EBEIT	Information Technology
Webb, P, Prof	C2	Education	Mathematics Education
Abou-El-Hossein, Prof	C3	EBEIT	Mechatronics
Arnolds, C, Prof	C3	Business and Economic Sciences	Economics
Botha, RA, Prof	C3	EBEIT	Information Technology
Calitz, A, Prof	C3	Science	Computer Science

Rated Researchers			
NAME	RATING	FACULTY/ DIVISION	DISCIPLINE
Farrington, SM, Prof	C3	Business and Economic Sciences	Business Management
Ferg, EE, Prof	C3	Science	Chemistry
Frost, CL, Prof	C3	Science	Biochemistry
Herselman, M, Prof	C3	EBEIT	Information Technology
Mayekiso, TV, Prof	C3	DVC: Research	Psychology
McClelland, CW, Prof	C3	Science	Chemistry
McGrath, P, Prof	C3	EBEIT	Mechanical Engineering
Naude, P, Prof	C3	DVC: Academic	Theology
Ocran, M, Prof	C3	Business and Economic Sciences	Economics
Pottas, D, Prof	C3	EBEIT	Information Technology
Radder, L, Prof	C3	Business and Economic Sciences	Marketing Management
Shakantu, W, Prof	C3	EBEIT	Construction Management
Singh, P, Prof	C3	Education	Curriculum and Educational Leadership
Van Der Merwe, A, Prof	C3	EBEIT	Information Technology
Venter, A, Prof	C3	Science	Physics
Wesson, JL, Prof	C3	Science	Computer Science
Zeelie, B, Prof	C3	Science	Chemistry
Du Plessis, M, Dr	Y2	Science	Computer Science
Mzilikazi, N, Dr	Y2	Science	Zoology
Steyn-Kotze, J, Dr	Y2	Arts	Political Science
Thomson, K-L, Prof	Y2	EBEIT	Information Technology
Tshentu, Z, Prof	Y2	Science	Chemistry

2013 New NRF Rating Application Outcomes

The following staff members were newly rated in 2013:

Prof Avinash Govindjee: C2



Prof Avinash Govindjee's research work focuses primarily on social security law and labour law, from regional and international perspectives. He has been involved in a range of labour and social-security related projects for various South African government departments and agencies, most recently in relation to the introduction of return to work arrangements in South Africa, and will shortly commence work on a similar project for the Government of Namibia. Prof Govindjee has published widely in South Africa and abroad on themes related to human rights, with specific emphasis on labour, social security and equality law. The panel that considered Prof Govindjee's application for rating were all convinced that he met the criteria of being an established researcher with a sustained record of productivity in his areas of expertise, which were found to be appropriately focused. His research work is having a discernible and significant impact at national and, increasingly, regional and international levels.

Prof Johan van Niekerk: C2



Prof Johan van Niekerk is part of the well-established information and cyber security research team in the School of ICT. His primary research focus is on

the human factors related to cyber security. He has been working on issues relating to the establishment of an information security culture within organisations, the education of employees regarding information security, and the use of technology to reduce the risks posed by humans involved in information security efforts. He is a member of several internationally established working groups in these fields, including IFIP TC 11.8 and TC11.12. He also runs an extensive cyber security educational campaign amongst schools in the Nelson Mandela Metropole. In an effort to improve the delivery of the cyber security message to the youth, Prof van Niekerk's current work focusses on the use of computer gaming as educational tools.

Prof Tim Gibbon: C2



Prof Tim Gibbon's area of research is high-speed telecommunication using optical fibre technology. Optical fibre is crucial for enabling next generation Internet, fibre-to-the-home and big data projects such as the Square Kilometer Array (SKA). The work itself is a fascinating blend of complex research challenges and applied real world technologies. As such, it is possible to both publish and collaborate with major industry players, thus bridging the gap between academia and industry. Prof Gibbon has been fortunate to work at, and collaborate with, a number of leading international universities. This has resulted in a healthy publication record and recognition by both academics and industry players as being an expert in his field. Prof Gibbon has also been extensively involved in training postgraduate research students. The mentoring and guidance that he has received over the years from the research group leader, Prof Andrew Leitch, has further been invaluable.

Prof Cecil Arnolds: C3



Prof Cecil Arnolds is an established researcher with a sustained record of productivity in the field of business management. His peers recognise him as having produced a body of quality work that attests to ongoing engagement with the fields of employee motivation, job performance and organisational commitment. He engages in practical and relevant national research that has added value in both the local academic and business environments. He publishes in a range of local and international journals, many of which are accredited and recognised. Prof Arnolds also researches leadership issues on the African continent and alternative businesses such as co-operatives. He further has a strong interest in the management and leadership of educational institutions in both the secondary and tertiary sectors. He is the Research Director of the NMMU Business School, teaches research methodology to MBA and DBA students, serves on many editorial boards of journals, and supervises many Masters and Doctoral students.

Prof Dalenca Pottas: C3



The multidisciplinary area of health informatics formed the basis of Prof Pottas's research over the past decade. Themes representing her interests include: electronic patient records, privacy and security of health information, and the design of health information systems that promote societal development. The predominant aim of the research was to achieve and promote secure, effective and efficient use of health information. Recognising that different settings produce different outcomes, an important objective of the research was probing of implications in the South African context. Following the release of *South Africa's National eHealth Strategy* in July 2012, Prof Pottas aimed to delineate research projects that can contribute to the implementation of this strategy. Her future research projects will emphasise key principles underpinning the *National e-health Strategy*, notably health information security and patient privacy, as well as contribute to improving South Africa's eHealth maturity with a view to supporting the National Health Insurance scheme.

Dr Mathys du Plessis: Y2

Dr Du Plessis's research interests all fall within the broad field of Computational Intelligence. The primary focus of his research has been on optimisation in dynamic environments by means of differential evolution. Another major research focus has been into the use of neural networks as physics simulators in evolutionary robotics. The initial phase of the research project involved the

creation of motion simulation neural networks for a differential steered robot and more complex robot morphologies. Current research is focused on the concurrent creation of simulators and controllers in evolutionary robotics.



Dr Joleen Steyn-Kotze: Y2



Achieving an NRF-rating is dependent on a variety of factors, of which a combination of individual commitment, drive and passion, and institutional support are central. Passion, drive and asking for help when it is needed are key to maintaining a research agenda and gaining recognition for your hardwork within the broader institutional framework. To this effect, factors that contributed to Dr Steyn-Kotze's research rating were the ability to capitalise on the support structures offered through teaching replacement grants and various workshops. Research, and more importantly, research learning as a lifelong process where skills development remains a constant requirement. Dr Steyn-Kotze's research is centred on the difficult democratic questions that characterise societies in transition, including nation-building, reducing inequality, and creating strong democracies and political stability in a non-Western context, particularly the African context; there is vast room for skills development and growth in this area. While the research focus falls within the broader field of comparative politics, the need to refine a research agenda around the lived democratic experiences of people is where her research agenda makes a strong contribution. Democracies cannot survive if the voices of all people, especially the marginalised, are not heard.

DHET Research Output Units

The research output units allocated by the DHET for research publications and graduating Masters and Doctoral students represent a crucial benchmark of research excellence and is based on successful Doctoral and Masters graduates and subsidies generated through academic publications.

Distribution of Doctoral Graduates by Faculty (2011 - 2013)

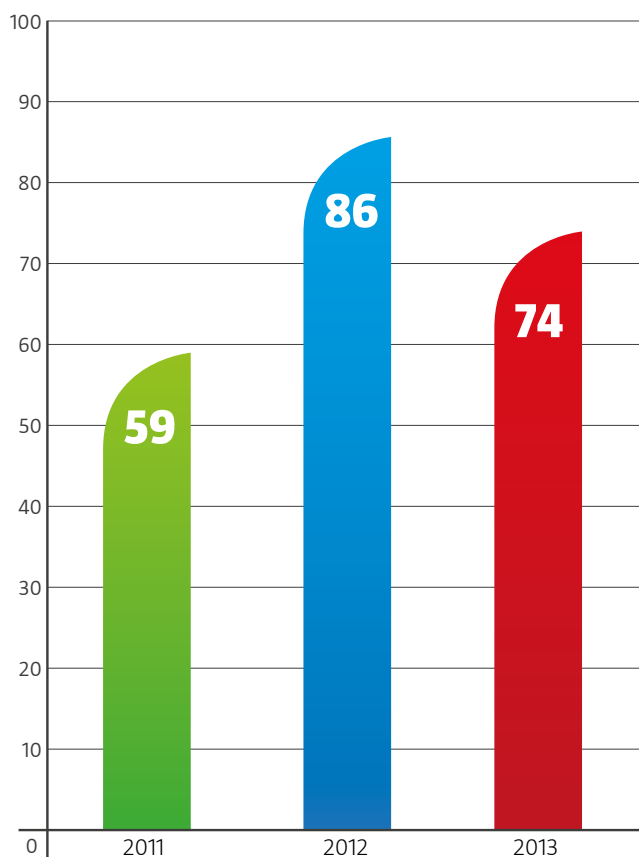
FACULTY	2010	2011	2012
Arts	8	6	9
Business and Economic Sciences	12	25	16
EBEIT	6	10	12
Education	6	8	9
Health Sciences	3	4	7
Law	-	4	3
Science	17	29	18
Total	59	86	74

DHET Research Output Subsidy Units (2011– 2013)

Year	Journal Articles	Books/ Book Chapters	Conference Proceedings	Publications Total	Research M & D Units	Total
2011	283.26	7.95	59.98	351.44	387.899	739.339
2012	268.52	4.22	38.79	311.53	393	704.53
2013	254.31	*	*	*	358	

* not yet available

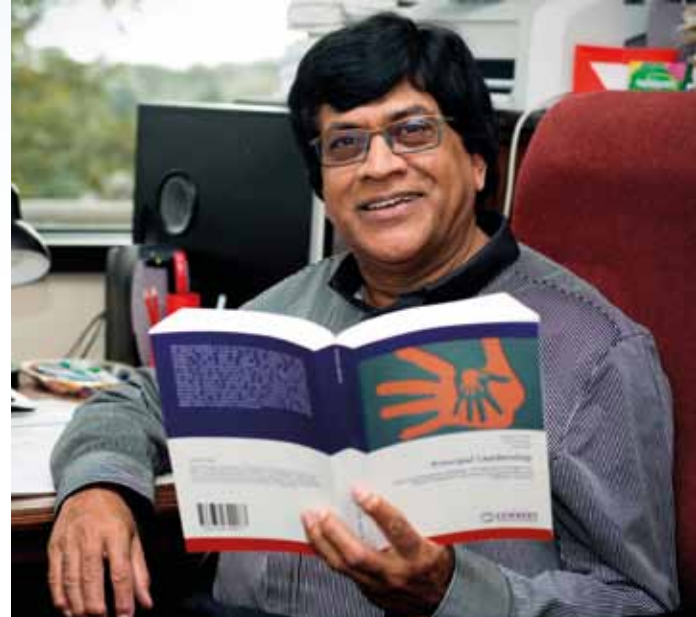
Number of Doctoral Graduates (2011 - 2013)



Research Masters Output Numbers per Faculty (2013)

FACULTY	MASTERS
Arts	16
Business and Economic Sciences	18
Education	15
Engineering, the Built Environment and Information Technology	20
Health Sciences	17
Law	2
Science	48
Total	136

Top 20 Researchers based on Journal Articles			
TITLE	INITIALS	SURNAME	UNITS
Prof	P	Singh	10
Prof	RM	Cowling	6.195
Prof	JB	Adams	6.047
Prof	TV	Mayekiso	5.83
Dr	E	Figueiredo	5.6
Prof	G	Olivier	5
Prof	R	Von Solms	4.67
Dr	EC	Hosten	4.577
Prof	TIA	Gerber	4.357
Dr	RB	Betz	4.297
Dr	ML	Crous	4
Prof	K	Abou-El-Hossein	4
Prof	GIH	Kerley	3.853
Prof	N	Phaswana-Mafuya	3.38
Prof	AWR	Leitch	3
Dr	L	Snodgrass	3
Prof	EE	Ferg	2.875
Dr	GJ	Measey	2.855
Prof	JR	Botha	2.775
Prof	PJ	Badenhorst	2.5
Prof	VA	Lawack	2.5
Prof	RS	Masango	2.5
Prof	M	Van De Venter	2.5



Prof Prakash Singh



Prof Richard Cowling

Innovation Overview



NMMU continues to drive innovation and technology transfer by creating awareness of Intellectual Property issues and through the protection, management and commercialisation of NMMU's intellectual property. The following is a brief account of the progress made in 2013 across the spectrum of innovation activities. Innovation projects at various stages of development and from various disciplines are also highlighted.

Intellectual Property

Seminars, workshops and information booklets on Intellectual Property were arranged by the Department of Innovation Support and Technology Transfer in 2013. These aim to raise awareness of intellectual property issues as well as to introduce staff and students to the basics of intellectual property, ownership issues, and relevant legislation. The seminars and workshops are given by patent attorneys and industry specialists. Highlights included a one-day IP Wise™ workshop in conjunction with the Southern African Research and Innovation Management Association (SARIMA) and the National Intellectual Property Management Office (NIPMO) in May 2013, as well as a visit by Ms Sandra Clelland of Von Seidels Attorneys who spoke about patents and designs and conducted one-on-one consultations with interested academics and students. The theme of 2013's campaign remained "THINK INNOVATE DISCLOSE" and was well received by staff and students.

Identification and Protection

During 2013, 22 disclosures were received from staff and students and five provisional patent applications were filed. Of the disclosures, 12 became new projects or were additions to existing projects and two are pending further information, meaning that 64% of the disclosures were potentially commercialisable. Two "international" (Patent Cooperation Treaty) patent applications were filed in 2013. Three South African National Phase Applications were also filed in 2013 and two patents were granted. One invention has been filed in a further five countries.

Management

Twenty-three projects in the pre-commercialisation phase were managed in 2013. This phase has four stages: pending research, proof of concept, building a prototype and market-ready. Projects managed across the stages were varied and at different levels of activity. Examples include automated guided vehicle technology, a formulation for easier removal of hair braids, battery health sensor, and mitigation of single bit upsets.



Battery Sensor

Commercialisation

A wholly-owned company of NMMU, Innovolve (Pty) Ltd, is responsible for the commercialisation of NMMU's intellectual property, which is licensed or assigned to the company from NMMU. Five projects were considered to be in the commercialisation stage in 2013, including two design projects being incubated in the Arts and Design Incubator. Four projects have been fully commercialised and the NMMU continues to be significantly involved in those projects.

Contribution to Local and Regional Innovation

NMMU champions the Regional Innovation Forum that is an initiative of 14 local organisations concerned about innovation. Created under the auspices of the Department of Science and Technology, the Forum brings together stakeholders from academia, industry and government to provide a voice for innovation in the region and to drive various innovative projects. The Regional Innovation Forum has held a number of events to discuss topics of interest, and hosts a website showcasing innovation events and information. Events in 2013 included a seminar on the energy in partnership with the Nelson Mandela Bay Business Chamber and the South African Energy Efficiency Association, a discussion on opportunities for composites and a lecture on financing the energy landscape.

The development of an incubator at NMMU was successfully proposed during 2013. The incubator, to be called Propella, will support, develop and grow new innovation-based enterprises in the local economy. Propella will operate as both a physical incubator and a virtual incubator and, while a key focus will be the commercialisation of NMMU technologies, Propella will also support locally-developed innovation-based enterprises that can take advantage of the networks into NMMU. Propella will be officially launched during 2014.

NMMU continues to play a role in supporting technology transfer activities at the other Eastern Cape institutions. This activity, supported by the National Intellectual Property Management Office, will continue in a mentorship role during 2013 when the universities create their own capacity in technology transfer.

Innovation Projects and Initiatives

Uyilo e-Mobility Programme

The Uyilo programme was launched in March 2013 by NMMU and the Technology Innovation Agency. The programme, hosted by NMMU, aims to develop viable infrastructure for the use of electric vehicles in South Africa. Establishment of the programme will enable application and solution-driven support to be provided to the emerging electric vehicle industry. The programme strives to encourage the entry of electrical vehicles to the South African market, but also to enable economic growth and to drive technology innovation. Since its inception, the programme has been supported by stakeholders from all sectors, including Powertech Batteries, Eskom, Sasol, Nissan SA, BMW SA, CSIR, Nelson Mandela Bay Metro, NMMU and TIA. The NMMU has a number of working electric vehicles, which it will use to test infrastructure.



One of the electric cars used for testing in the Uyilo e-mobility programme.

Development of Weldcore™ Technology

eNtsa, NMMU's Technology Station in the School of Engineering, has continued development of their Weldcore® technology. This unique engineering technology offers an efficient, cost-effective way to quantitatively test whether to replace engineering structures by removing representative samples from a potentially degraded material or repairing the sample site. New applications have been developed for the technology across a range of industry sectors, providing a suite of products and services that will form the basis for a spin out company.

Algae-to-Energy

The Micro-algae to Energy (MAZE) project being run by InnoVenton, NMMU's Institute for Chemical Technology, has undertaken an engineering study for the development of a one hectare demonstration plant. The demonstration plant will focus on algae cultivation in photobioreactors and the use of algae to bind waste coal to produce higher value coal agglomerates, Coalgae™.

Further work will lead to the development of a biofuel. The project has received significant funding from the Department of Science and Technology via the Technology Innovation Agency. NMMU's approach is unique and has attracted national and international attention. The project currently holds five patent application families in various stages as well as a trade-mark registration application that was filed in 2013.



Batteries of algae growth tubes in the greenhouse at InnoVenton.



Coalgae pellets after production.

Street Light powered by Renewable Energy

An entrepreneur has signed an option agreement with NMMU to commercialise an off-grid urban lighting system powered by a combination of a vertical axis wind turbine (VAWT) and photovoltaic (PV) cells that has been developed by NMMU. The system, trade marked as Twerly™, will allow for off-grid installation, providing clean lighting to urban and rural areas without the need for cabling, which reduces the risk of theft. A prototype unit has been operating at NMMU. Below are the Twerly lights that were installed in front of the IDZ building in East London.



"Twerly" lights at the East London IDZ

Arts and Design Incubator

The Arts and Design Incubator assists NMMU creative arts graduates to kick-start their businesses. In 2013, the Incubator became a new home for Ms Kelly Esterhuyse (under her label Kelly Mae) along with the previous businesses started by NMMU graduates, MooiMooii and MaXhosa by Laduma™.

Ms Kelly Esterhuyse works on wool and mohair designs and her collection consists of classic, classic with modern infusion and modern knit-wear designs. She won the Elle/Mr Price New Talent Competition in 2011 and launched a limited range at Mr Price consisting of tropical prints, knits and beautifully tailored pieces in 2012. She showcased her collection at the SA International Mohair Summit in October 2013 with the support of Mohair SA and NMMU.

Laduma Ngxokolo continued to develop his business and markets for his knitwear range (www.africanknitwear.com). He has moved his business to Cape Town for logistical reasons and left the Incubator during 2013. The NMMU continues to play a role in his business.



Ms Kelly Esterhuyse modelling some of her mohair knitwear collection.

Research Excellence



Prof Janine Adams

NMMU Researcher of the Year and Faculty of Science Researcher of the Year

Prof Janine Adams' research addresses key issues in the fields of aquatic botany, environmental flow requirements and estuary ecology. The sea-land estuary interface is occupied by diverse and specialized plant habitats such as mangroves and salt marsh. At this interface global climate change translates into a modification of salinity and inundation effects. An understanding of the effect of these environmental factors on plant growth and survival is required to predict, manage and adapt to climate change. Research determined the present state, distribution and population structures of mangroves in South Africa. The findings of this research provided input to SANBI's National Biodiversity Assessment and estuary management plans, which are a requirement of the Integrated Coastal Management Act of the Department of Environmental Affairs. An understanding of the responses of plants to changes in environmental conditions also provided input to the Department of Water Affairs' ecological water requirement studies.

In collaboration with a multi-disciplinary group of scientists from around the country, a study funded by the Global Environmental Facility investigated the feasibility of linking the Mfolozi River back to the St Lucia Estuary and the responses of the estuary to different management scenarios at the isiMangaliso World Heritage site. The research provided input on the estuary habitats and future adaptive management strategies. A modeling study on the effects of global climate and land-use change on the distribution of mangroves in South Africa was completed in collaboration with Rhodes University and the Vrije Universiteit Brussel, Belgium.

Although research is a continuum of outputs and achievements, 2013 was a productive year with 12 publications in accredited journals. Two chapters were also published in the book: *Ecology and Conservation of Estuarine Ecosystems: Lake St Lucia as a model*. High impact and quality research outputs were produced which have advanced knowledge on the conservation and management of South Africa's estuaries. Research successfully linked science, policy and management through extensive collaboration and networking with universities, institutes and government departments.

Prof Adams was invited to co-chair a special session on small estuaries at the Coastal and Estuarine Research Federation Conference in the USA (November 2013). She served on the scientific committee for the Western Indian Ocean Marine Science Association symposium in Maputo, Mozambique and was the invited South African participant on the review panel for the Belmont forum proposals on coastal vulnerability, which met in Washington D.C. In 2013, Prof Adams continued her role as President of the Southern African Society of Aquatic Scientists, a fellow of the Royal Society of South Africa and Eastern Cape branch representative.

Research Excellence Awards



Prof Shelley Farrington

Prof Shelley Farrington is an Associate Professor in the Department of Business Management. She teaches Business Management and Entrepreneurship modules at both undergraduate and postgraduate level. She is a founder member of the NMMU Family Business Unit and has been instrumental in negotiating NMMU's participation in the global STEP (Successful Transgenerational Entrepreneurship Practices) research project. Her research focuses on entrepreneurship, small business and more specifically family business. Prof Farrington plays a significant role in promoting a research culture in the Department of Business Management and has also mentored several colleagues in other departments. She believes that research provides knowledge that enables her to add value to both her students and society in general. She feels that it is this added value that enables her to make a difference.



Prof Naydene de Lange

Prof Naydene de Lange holds the HIV and AIDS Education Research Chair in the Faculty of Education. She draws on visual participatory research methodologies, such as drawing, photovoice and participatory video (also cellphilms), and uses these to research issues around gender and HIV and AIDS in schools and communities. A current project, *"Not leaving data in the dark"*, funded by the NRF, developed a digital archive to manage and re-use the visual data generated over the years, to further research on gender and HIV and AIDS issues. Using visual participatory research methodologies, which have elements of playfulness, is seen as a way to overcome being "sick of AIDS". Prof de Lange is committed to participatory research, which as research intervention, can contribute towards making a difference in the age of AIDS.

Innovation and Technology Transfer Awards

Continued Innovation Excellence



Prof Ben Zeelie

Prof Ben Zeelie is known as the visionary behind InnoVenton – an internationally-recognised Institute for Chemical Technology that he established just after the merger in 2005. As Director of InnoVenton, Prof Zeelie has spearheaded many applied research projects, the most prominent of which is the current “Algae for Biofuels” project that was recently recognised by Technology Innovation Agency (TIA) for fast-tracking, because of its importance to the country.

Outstanding Innovation Achievement



Prof Russell Phillips

Prof Russell Phillips received the Innovation Award for Outstanding Innovation Achievement. Prof Phillips has been involved with wind and solar energy research projects for a number of years and is continually looking for innovative ways in which to enhance the efficiency of the energy systems that his research revolves around. He has been involved in social projects in the erstwhile Transkei, installing wind turbines for schools in areas where there is no grid infrastructure for electricity. He is widely recognised for developing novel blades for turbines and his innovations for social benefit. Prof Phillips

and his research group are also currently in the final stages of developing a heat engine that will be able to generate electricity from solar heat stored in a rock thermal battery designed by the group. Cost effective storage of renewable energy is in his words “the missing link” in the industry. The Twerly hybrid streetlight, which runs solely on wind and solar energy was also developed by Prof Phillips and colleagues in the Engineering Faculty and is currently being commercialised.

Engagement Awards

NMMU Emerging Excellence Engagement Award



Dr Ronel Nel

Dr Ronel Nel – Turtle expert, Marine Biologist and Senior Lecturer in the Department of Zoology, has been involved in several significant engagement activities. To mention just two: with her team of assistants she hosted the sixth International Sandy Beach Symposium, delegates from 13 countries attended the Symposium, which was by all accounts a resounding success. It was 30 years ago that the Symposium was last held in South Africa. Secondly, Dr Nel organised and chaired the fourth meeting of the Marine Turtle Task Force in December. This important meeting, which took place at NMMU, was attended by 14 countries. The Task Force seeks to monitor the state of the world’s turtle population and recommends special sites for international turtle research.

NMMU Engagement Excellence Team Award



eNtsa

eNtsa is a leading research and engineering unit that is led under the guidance of its Director, Prof Danie Hattingh. This dynamic group of engineers,

technical staff, office professionals and researchers has over the past three years received various recognitions for their contributions and efforts within the field of friction processing. More recently, the group in conjunction with the Technology Innovation Agency (TIA), launched the establishment of the Uyilo E-Mobility programme at NMMU, which is a national initiative to develop Electric Vehicle (EV)-related technologies and skills. This group has also secured numerous industrial contracts for the NMMU that are effectively utilised to enhance academic knowledge and professional expertise. eNtsa continuously drives towards its vision of “engineering innovative solutions for a sustainable future” by embracing its slogan and operational culture of providing “innovation through engineering”.

NMMU Engagement Excellence Award



Prof Paul Webb

Prof Paul Webb is a professor of science education and the driver of the NMMU Institutional Research Theme: Science, Mathematics and Technology Education for Society. His interests are in promoting scientific literacy, language and learning in science and mathematics, the nature of science and indigenous knowledge, and the use of technologies for teaching and learning in science and mathematics education. Much of the research he has conducted in these fields has been enabled through engagement with schools and education departments in most of the provinces of South Africa. His work on promoting scientific literacy in schools has been published widely and particular recognition of his expertise is borne out of the fact that he had a paper solicited by the editor of, and published in, the renowned international journal *Science*.

Performing and Creative Arts Awards

Music



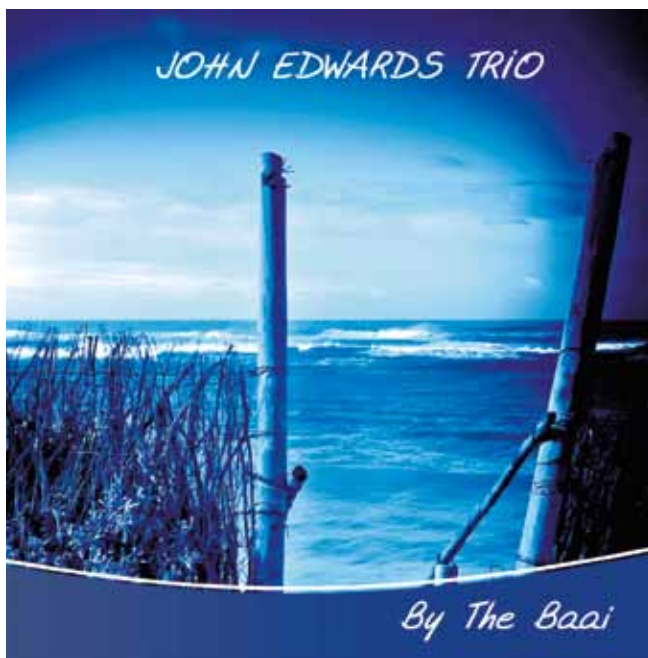
Mr John Edwards

Mr John Edwards is a jazz pianist/composer and educator. Originally from Durban, he graduated from the University of Kwazulu-Natal with a Masters in Jazz Performance, Composition and Arranging (*Cum Laude*) in 2004. Throughout his studies and subsequent academic career, he has maintained a parallel career as a professional composer/performer. Although his preferred medium is acoustic jazz- and much of his creative outputs through the years exemplify this, his musical versatility has enabled him to perform, compose and record in several musical contexts including rock bands, jazz/classical fusions, dance productions, cabaret, and cruise ship engagements.

Mr Edwards was appointed on a contractual basis as Jazz Studies Lecturer at NMMU in February 2010. He successfully applied for a full-time Associate Lecturer post in 2013. He was also successful in his application for the 2013 NMMU Performing and Creative Arts award in recognition of “Meritorious Creative Outputs in the Field of Music: Published Recording of Original Musical Compositions”. This published recording is in the format of a compact disc, which represents the culmination of many years of theoretical and practical study and work experience on his part in the interdependent domains of performance, composition and improvisation. The compact disc is titled “By the Baai” and comprises eight original pieces all of which are performed by the John Edwards Trio. The jazz trio features Mr Edwards on piano, Andrew Warneke on bass guitar, and Devon van Rooyen on drums. The recording was largely self-funded although some financial support was gratefully received from NMMU Marketing and Corporate Relations. It was recorded at the SABC studios in Port Elizabeth in October 2012.

He has continued to be productive in 2013 with regard to varied creative outputs and what follows is a brief illustration of this.

1. **Recording with Shawn Phillips:** In January/February 2013 Mr Edwards collaborated on an album with Port Elizabeth-based, internationally-renowned guitarist/vocalist, Shawn Phillips. He was approached by Phillips to play the piano and several other keyboard instruments on the recording. The album, Phillips' 25th recording and titled "Perspective" was released in October 2013.
2. **Launch of "By the Baai":** On February 23, 2013 the John Edwards Trio launched "By the Baai" with a well-attended public performance of the compositions that comprise the album. The concert took place in the South Campus Auditorium and the disc was on sale at the concert; sales were in excess of 100 copies.
3. **Performance at National Conference:** On 26 March 2013, the John Edwards Trio performed the original compositions that comprise "By the Baai" at the conference of the South African Society of Music Teachers (SASMT), which was held in the Music Department at Rhodes University, Grahamstown. This performance was at the invitation of the President of the Society and was included in the programme of events.
4. **Performance with FeyaFaku:** On 17 September 2013, the John Edwards Trio performed with internationally-renowned trumpeter, Feya Faku, in Isisusa, a large-scale public jazz concert in the Port Elizabeth Opera House. Mr Edwards initiated, devised and directed the event in collaboration with the NMMU Department of Arts and Culture who provided the financial backing. Feya is greatly respected in local and international jazz circles and the success of the collaboration indicates that the artistic and technical capabilities of John Edwards' jazz trio is of a very high standard. The repertoire for the performance consisted of original compositions by both Feya and Mr Edwards.
5. **Performances by the NMMU Big Band:** The Isisusa concert also featured the NMMU Big Band, which is directed and conducted by Mr Edwards.



Cover of John Edwards Trio CD.

The Big Band is comprised solely of NMMU music students (and Mr Edwards on piano) and the exuberant dynamism, musical ability and professionalism of this diverse collective reflects extremely positively on the University. Mr Edwards built the band up from scratch when he first started working at NMMU in 2010. Their numerous acclaimed performances (which include lunch hour concerts, Isisusa and the Vice-Chancellor's Cultural evening in October 2012) are the result of an extensive rehearsal schedule and testament to Mr Edwards' success in teaching the band members relevant concepts pertaining to jazz improvisation and performance. The band's repertoire has a particular focus on South African jazz and all the musical arrangements for the respective instruments are scored by Mr Edwards. The Big Band also performed at two well-attended public lunch hour concerts in the South Campus Auditorium in May and October 2013.

Visual Arts



Ms Andrieta Wentzel

Andrieta Wentzel received her Creative Outputs award for the life size bronze portrait of Bishop James Limba, founding father of the Bantu Church of Christ (BCOC). The portrait was produced on commission for the BCOC, in the Centenary year of the founding of the church. This artwork was installed near the railway siding at Kendrew, on a specially designed and constructed granite base. A second component of the commission is the creation of a 2.2 metre standing sculpture of Bishop Limba. This will be cast in bronze, and installed on the premises of the BCOC in New Brighton. The sculpture will be unveiled on the 26th December 2014.

Ms Wentzel actively encourages her art students to engage with the multiple artworks that she creates in-and-around the practical studios. She believes in the crossover of the real studio with the teaching studio, and the visualization/demonstration of the many processes and procedures that are inherent in the making process. Embedded in the complexity of processes is the conceptual basis for making, from which arises the research of images, visual references,

sources, materials, methodologies, histories, related details, and the contextuality within which the contemporary art work is created.

Ms Wentzel has recently returned from attending the inaugural collective Exhibition of the previous winners of the Helgaard Steyn Award (which she won in 2007), which was held in the Museum on the Wine Estate of La Motte. She produced three composite drawings for the show, which related to her ongoing interest in the exploration of "The Other", and how this "Other" is interpreted and represented within contemporary society.

Ms Wentzel is one of the Art School staff members who is pursuing practice based doctoral studies at the Stellenbosch School of the Visual Arts.

National Equipment Programme – NRF

In 2013 Profs Vincent Kakembo of Geosciences and Danie Hattingh from Mechanical Engineering received large grants from NRF under the National Equipment Programme (NEP).



Prof Vincent Kakembo and Mr Prevlan Chetty - GIS and Remote Sensing Processor at Southern Mapping GeoSpatial Company, Johannesburg.

Prof Kakembo was granted R1,005,000 by the NRF to purchase a Spectroradiometer. This amount was topped-up by NMMU with R501,746. The equipment captures hyperspectral remote sensing data and captures spectra for different plants and surfaces. It has fast, full-spectrum UV/VIS/NIR measurements (350-2500nm) with just one scan. It possesses the ability to tag spectra with GPS and digital camera imagery. It also has ultra-fast auto-shutter, auto-exposure, and auto-dark correction before each new scan and a built-in laser targeting for precision and accuracy. The instrument is therefore well suited for NMMU's current and future research work in hyperspectroscopy.

The spectro radiometer will improve understanding of narrow bands spectral information, due to the instrument's capability to collect spectral information in narrower bands within a wider range of the electromagnetic spectrum. Previously, NMMU only focused on broad-band imagery, losing out on the much needed hyper spectral data in the narrow bands. Hyper spectral sensors enable the capturing of spectral data in narrow bands.

The new equipment will strengthen research collaboration with NMMU's Centre for African Conservation Ecology, the Sustainable Research Unit at the George Campus of NMMU, and entities at Walter Sisulu University and the University of Fort Hare. It will also contribute towards joint research work on climate change vulnerability and ecosystem health with the University of Oldenburg in Germany.

One Doctoral and four Masters' students were identified to work on projects directly related to the new equipment.



Prof Danie Hattingh and Ms Nthatsi Kolozi (MTech Mechanical Engineering student) working on the WeldCore Platform.

Prof Hattingh from the Friction Processing Research Institute was granted R9,962,000 by NRF for a TruLaser Robot 5020 and this was supplemented by a R4,973,531 grant from NMMU.

The Tru Laser Robot 5020 was configured by the research team at NMMU with engineers from Trumpf to serve as a flexible laser process development research platform, mainly in aid of the advance manufacturing sector of the Eastern Cape and South Africa. The configuration allows for joining, treatment and optimisation of sheet metal fabrication as applied to the local automotive and component industry. The laser/robot configuration of the platform enables research and development in laser-joining and cladding as advance processing technologies and will contribute to high level human resource development to ensure transient from conventional joining processes to more production efficient processes. The laser metal deposition or scanner welding ability is certainly one of the abilities that hold the most potential for new research to be developed.

The impact of the equipment will be national and international. The research conducted will focus on conducting applied research in laser-joining and cladding processes and engineering product development that will support industry needs and development, with a specific focus on research questions that bring knowledge closer to commercialisation. The platform will ensure that the impact benefits society through improved product, processes and services, as well as enhanced industry competitiveness.

The current research in the field of Friction Stir Welding as an alternative joining technique was first established through a collaboration between NMMU and Plymouth University in 2000. The "new" advance manufacturing cell will provide the necessary infrastructure to support, maintain and increase NMMU's research ability in the field of manufacturing and materials.

It will enhance the researcher's ability to develop new and improved consumer products and processes, perform short-medium-and long-term exploratory research into product and process development on behalf of industry, access funding to assist with commercialisation of contract research projects and provide a major new focus area for the NMMU in terms of product and process technologies for the Eastern Cape manufacturing sector.

Four Doctoral and two Masters' students were identified to work on projects linked to the new equipment. Collaboration linked to the equipment includes the following entities: CSIR, ESKOM and the Universities of Plymouth (UK), Lund (Sweden), Farara (Italy), Sheffield (UK) and South Carolina (USA). The research is further supported by three internationally-based professors holding honorary and adjunct professorships with NMMU.

Leading research in an under-researched area: Key Populations



Prof Nancy (Refilwe) Phaswana-Mafuya

Prof Nancy (Refilwe) Phaswana-Mafuya, Honorary Professor at NMMU and Director of the Social Aspects of HIV/AIDS Research Alliance, is leading research projects in the highly under-researched area of key populations. She is the Principal Investigator of the two-year Key Population Implementation Science project funded by the Centres for Disease Control, entitled: "Leveraging community and peer-based approaches to enhance the continuum of HIV care from awareness of HIV status to viral suppression among men who have sex with men (MSM) living with HIV in South Africa".

The study is conducted by the HSRC in collaboration with Johns Hopkins University, Baltimore, USA and Emory University, Atlanta, Georgia, USA and the DTHF. This study will be undertaken in six sites within South Africa, namely: Port Elizabeth in the Eastern Cape; Khayelitsha and Gugulethu in the Western Cape; Pietermaritzburg in KwaZulu-Natal; Vhembe and Mopani districts in Limpopo; Nelspruit and Mapulaneng district in Mpumalanga; and Soweto in Gauteng. This study will use a stepped-wedged design in which three sites will be randomised to receive immediate onset intervention, and three sites will

receive delayed onset intervention. In the intervention sites, men who have sex with men (MSM) will be tested for HIV using the provincial algorithms. Men who test positive for HIV will receive a Point of Care (POC) CD4 count to assess eligibility, and if eligible, a POC creatinine will be performed, and they will be initiated on ART by a NIMART trained nurse. Men who are not eligible by both CD4 count and WHO staging will be assigned to a peer health navigator. The control site participants will receive the standard care provided by an LGBT-friendly clinic, which will receive training from the team.

Prof Phaswana-Mafuya is also Site PI of a four-year NIH and CDC funded study, entitled: "Methods of Prevention Packages Program (MP3), which is a combination package of biomedical, behavioural and community-level HIV prevention interventions and services for MSM in Port Elizabeth". The overarching aim is to develop an optimized combination package of HIV prevention interventions for MSM in Port Elizabeth, to develop preliminary data about the acceptability of the candidate package, and to develop a rational proposal for a subsequent larger efficacy trial to test the combination HIV prevention package for MSM. This study is done by the HSRC in collaboration with Desmond Tutu Health Foundation, Johns Hopkins University and Emory University.

Prof Phaswana-Mafuya will be serving as site PI (Port Elizabeth site) for the South Africa MSM Health Monitoring Survey: Integrated Biological and Behavioural Surveillance (IBBS) with Population Size Estimation using Respondent Driven Sampling (RDS) among Men who have Sex with Men (MSM). The South Africa MSM Health Monitoring Survey is an initiative of the Centres for Disease Control and Prevention (CDC) funded via the United States President's Emergency Plan for AIDS Relief (PEPFAR).

This survey is being designed and implemented by the University of California, San Francisco (UCSF) along with local collaborators, namely: Human Sciences Research Council, the South African National Department of Health (NDOH), and the Anova Health Institute. These collaborators are united in efforts to design and implement survey activities among men who have sex with men (MSM) in South Africa to measure HIV prevalence, related risk behaviours, and access to prevention and care services. The overall approach is based on standardized methods for integrated biological and behavioural surveys (IBBS) used around the world with adaptations for the South African context.

The study proposes five sites for conducting the study:

- Mafikeng (North-West Province);
- Polokwane (Limpopo Province);
- Bloemfontein (Free State Province);
- Kimberly (Northern Cape Province); and
- Port Elizabeth (Eastern Cape Province).

A Memorandum of Understanding is being finalised between the HSRC and UCSF.

Professor Phaswana-Mafuya is also site PI for MAC AIDS Fund study, entitled: "Characterising Strategies to Prevent Mother to Child Transmission of HIV among Female Sex Workers in the Eastern Cape of South Africa". The study is conducted in collaboration with USA-based PI, Dr Stefan Baral (Johns Hopkins Bloomberg School of Public Health, Centre for Public Health and Human Rights, Department of Epidemiology, Baltimore, MD USA) and Co-PI, Andrew Lambert (TB/HIV Care Association, Port Elizabeth, South Africa).

Research Chairs



DST/NRF Research Chair in Microfluidic Bio/Chemical Processing (SARChI)



Prof Paul Watts

Professor Paul Watts has been the holder of the SARChI Chair in Microfluidic Bio/Chemical Processing since February 2013. In summary, the overall objective of this Research Chair is to investigate how new technology may be used to build African research and chemical production capabilities utilising new technology such as micro reactors, continuous flow reactors and microwave systems. These reactors differ from conventional batch methods in that they use small tubes that are placed parallel to each other to produce compounds at far lower cost. If South Africa could develop such capabilities, it would make the country independent of global supply chains. The chemicals that can be produced through these new processes can be

applied in the manufacture of pharmaceuticals and fine chemicals. Apart from the cost and immediacy of supply advantages, chemical production in these reactors significantly reduces the hazards of chemical manufacturing. The ultimate goal is to build this capacity to the point where all parts of Africa are able to produce pharmaceuticals and chemicals at an affordable cost, and to meet immediate needs.

In the first year, Prof Watts established collaboration with three companies (Uniqsis, Wavecraft and Little Things Factory) in setting up the laboratory. The research equipment available enables the researchers to use a variety of innovative new technology to conduct research on new chemical processes at high temperatures and pressures. This represents the first laboratory in South Africa to have such research infrastructure.

Three new research projects were initiated:

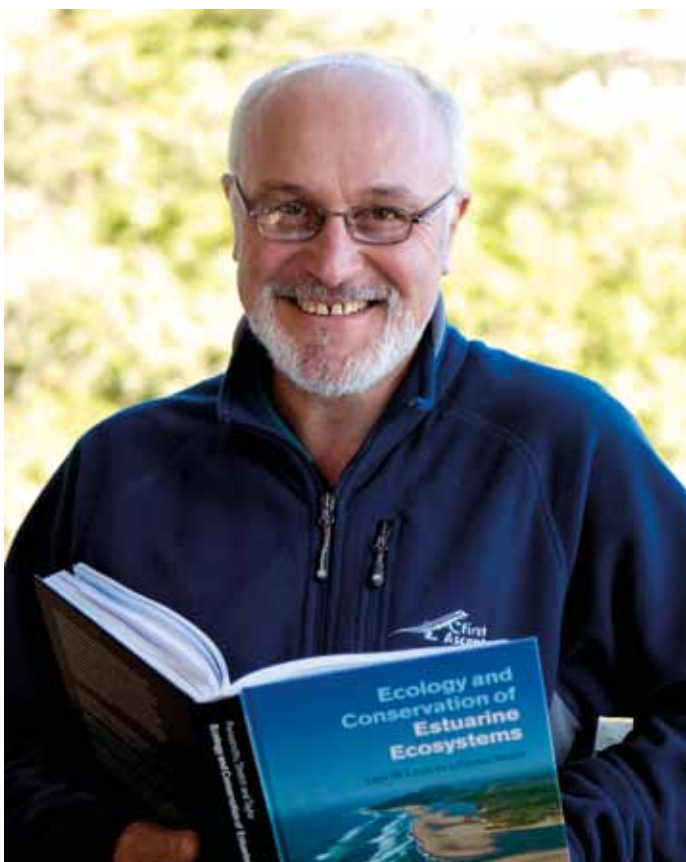
- a) **Development of a small production platform for citronellal processing.**
Citronellal is a natural product isolated from plants, which are prevalent in South Africa. One general vision is to be able to convert abundant natural resources into added-value chemical feedstock. In this project the raw material is being used to synthesize a range of different products and their chemical properties are being tested for a range of applications.
- b) **Scalable chemical manufacture.**
One significant advantage of continuous manufacture is that highly dangerous chemistry can be conducted safely as a result of the excellent heat transfer properties of the reactors. In Europe there are several examples of large scale manufacture in such systems, but the cost is prohibitive. This project is conducting research into making simpler, more cost-effective production technology.

c) Continuous flow synthesis of silicon compounds.

There is currently a shortage of silicon feedstock for many chemical applications. Conventional methods for the synthesis of silicon compounds are expensive and not environmentally-friendly. The challenge is to develop and optimize a continuous flow production platform for the direct synthesis of silanes, which may then be used to prepare many compounds.

Prof Watts is passionate about developing international partners, especially with BRICS countries. As such, he attended conferences in Brazil and India, where he gave keynote addresses. In total in 2013, Prof Watts gave five keynote lectures at international conferences, one invited lecture at an international conference and seven industry lectures/workshops in South Africa.

DST/NRF Research Chair in Shallow Water Ecosystems (SARChI)



Prof Renzo Perissinotto

The Chair initiated its official operations in July 2013, when Professor Perissinotto arrived on-campus from the University of KwaZulu-Natal (UKZN), Durban. Three of his team members, two MSc students and postdoctoral fellow, Dr Nelson Miranda, had arrived earlier in March-April, also from UKZN, and had already initiated the groundwork for the Chair. Following the arrival of another postdoctoral fellow from the University of Cape Town, Dr Matthew Bird, and a new PhD student from UKZN in August-September, by the end of the year the Chair's team was already substantial in capacity and fully functional.

The flagship project for 2013 focused on the rehabilitation of Lake St Lucia in the iSimangaliso Wetland Park. Research on the ecological functioning and biodiversity of this key estuarine lake, the largest in Africa, continues to have a major impact, both within the estuarine scientific community and the broader public. The Global Environment Facility (GEF) Project with sponsorship from the World Bank progressed towards its critical stage during 2013, with simulation models and recommendations now virtually ready to be submitted to Government for the implementation of a long-term rehabilitation plan for the estuarine lake. The iSimangaliso Park is already a major global tourist attraction and job creator in the northern KZN region and it is expected that the rehabilitation of Lake St Lucia will provide further impetus for development in the area.

The biodiversity census of Lake St Lucia, initiated in 2009, has now become one of the focal points of the Chair's operations. The new approach of making extensive use of specialised global expertise, and combining morphological and molecular taxonomy, has led to the descriptions of species previously unknown to science, both in St Lucia and elsewhere. Graduate students and postdoctoral fellows are now being trained with mentorship from group specialists and it is envisaged that other new taxa will be discovered and described in the near future. The importance of this cannot be overemphasised, as species are the building blocks of aquatic ecosystems and all are essential for their proper ecological functioning. The description of new species adds value to our natural resources and allows management decisions to be taken on a better-informed basis.

During 2013, the St Lucia project culminated in the production of a whole book, titled: *Ecology and Conservation of Estuarine Ecosystems: Lake St Lucia as a Global Model* and published by the prestigious Cambridge University Press in April 2013. It is a compendium comprising 21 chapters and 486 pages of integrated knowledge on the ecosystem functioning, conservation history and management of this complex system, which is also the world's first protected estuary. The book is already showing substantial impact worldwide and is likely to become a benchmark for international estuarine research and management in the forthcoming decade. Apart from this book, another ten articles were published in peer-review journals during 2013 by the Chair's team, on St Lucia and related estuarine systems. Oral presentations on St Lucia research findings were also made at the Coastal and Estuarine Research Federation Symposium held in San Diego, California, in November 2013.

The temporary wetlands of the Western Cape were also researched extensively during 2013, mainly through the involvement of the Chair's postdoctoral fellow, Dr Matthew Bird, who completed several studies initiated previously at the University of Cape Town. This work focused on the ecology of temporary wetlands, documenting their aquatic invertebrate communities and physico-chemical environments. The work resulted in two publications in 2013, both in the journal *Hydrobiologia*. Key results were also presented at the 2013 annual meeting of the Southern African Society of Aquatic Scientists (SASAQS) held at Arniston, Western Cape.



Prof Renzo Perissinotto (second from right) with members of the Chair's research team in the field at Seaview.



Prof Renzo Perissinotto (first from right) with members of the Chair's research team in the field at Lake St Lucia.

The recent discovery of extant tufa stromatolites on the Eastern Cape coast has led to the assembly under the guidance of this Chair of a substantial multidisciplinary investigation team, currently comprising botanists, zoologists, microbiologists, hydrologists, geomorphologists, inorganic chemists and others still in the process of recruitment. Stromatolites date back in the fossil record at least 2.7- 3.5 billion years and living marine colonies are currently only known from a few localities around the world, mainly in Australia and the Bahamas archipelago. They are generally regarded as "living fossils" and, therefore, there is globally a high demand for information on such systems. Their study may be instrumental in understanding the hydrospheric conditions that prevailed at the onset of life on Earth, as well as the processes that led to the origin of heterotrophy and the spread of life to freshwater bodies and land masses from the ocean. This multidisciplinary team will ensure that comprehensive investigations will be undertaken during the next few years within a project recently initiated at the Nelson Mandela Metropolitan University (NMMU), in collaboration with the South African Environmental Observation Network (SAEON), Rhodes University (RU), the University of KwaZulu-Natal (UKZN), and a number of overseas institutions. A "Research Letter" highlighting the discovery and their basic characteristics is currently in press in the *South African Journal of Science*.

DST/NRF Research Chair in Nanophotonics (SARChI)



Prof JR Botha

Professor JR Botha is a Professor of Physics at Nelson Mandela Metropolitan University and has been the holder of a national Research Chair in Nanophotonics since 2008. He is a Von Humboldt fellow, with extensive experience in the epitaxial growth of semiconducting layers and heterostructures, including quantum structures, and expertise in various electrical and optical techniques suitable for characterisation of nanostructures. He has over 90 papers published or accepted for publication in peer-reviewed international journals.

Professor Botha is involved in numerous challenging projects, including:

1. The development of InAsSb and related nanostructures for applications in mid-infrared detectors. This work includes the development of InAs/GaInSb strained layer superlattices and InAsSb quantum dots by MOCVD. MOCVD is a technique suitable for commercial scale deposition of semiconductors and offers control of the deposition process on the atomic scale.
2. The development of ZnO and MgZnO by MOCVD for ultraviolet detectors. This project focuses on issues such as p-type doping in ZnO (one of the outstanding issues preventing this exciting material from yielding high quality photo diodes), and the prevention of phase separation in MgZnO, in order to produce high quality ZnO/MgZnO quantum structures.
3. Chemical bath deposition of ZnO nanorods on silicon substrate for white light emitters. This work addresses the challenges of controlling the orientation and dispersion of nano seed crystals on silicon substrate, to act as templates for the formation of ZnO nanorods. It is also aimed at controlling the shape and size of the ZnO nanorods.

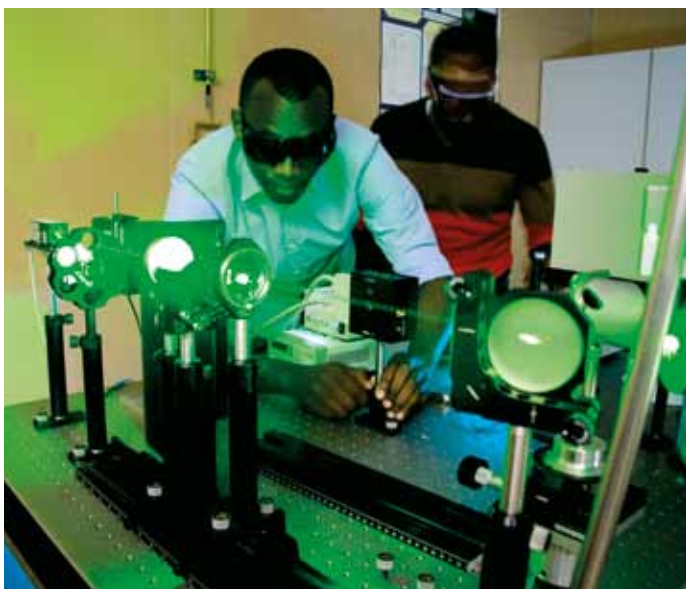
Apart from the very interesting fundamental phenomena manifesting themselves on the nano and quantum scales, and the challenges associated with manipulating and manufacturing semiconductor structures on these scales, this work is aimed at serving a local niche industry involving the manufacture of infrared sensors. Infrared sensors have a wide range of applications, ranging from missile tracking to atmospheric pollution monitoring and pharmaceutical process control. The latter two applications arise from the numerous absorption bands of hydro-carbons, water, carbon

oxides and gaseous sulphides in the 3 – 5 μm range of the infrared spectrum. The group recently achieved very promising results in this area of research, demonstrating InAs detectors with response comparable to that of commercial diodes available from the leading manufacturer of photo-sensitive devices in the world, Hamamatsu (Japan). The NMMU group is currently exploring funding mechanisms to take this research scale work to the next level.

Considerable effort also goes into the development of improved procedures for the manufacture of new materials and structures for light emitting and light detecting devices operating in the ultraviolet part of the spectrum. Recent results on the development of zinc oxide nanostructures, in particular, show promise for UV emission, which in turn can stimulate white light in an LED. The ability to produce high quality, high intensity white LEDs for solid state lighting is a world-wide endeavour, with a potential annual turnover of billions of US dollar.

This research group recently acquired a state-of-the-art scanning probe microscope courtesy of the NRF Research Infrastructure Support Programme and NMMU, valued at R7 million. This instrument is the first one of its kind to be installed in the Southern Hemisphere and provides morphological, mechanical, electrochemical, and electrical information of solids, polymers and biological material on the nano-scale. It is the fastest instrument of its kind on the market, allowing the monitoring of dynamic processes on a time scale of seconds. The ultimate height resolution is less than a nanometer.

Prof Botha says: “We strive to be at the forefront of international development and offer high quality postgraduate training. We have a suite of equipment second to none in Africa and several strong collaborations with overseas and local groups, which provide ample opportunity for staff and students to travel abroad. This type of academic exchange is vitally important to raise our international competitiveness.”



PhD students, Kharouna Talla and Zola Urgessa, aligning a laser beam for photoluminescence measurements.

DST/NRF Research Chair in Earth Systems Science (SARChI)



Prof David Bell

Highlighted research on Earth Systems Science represents continuing and new collaborations with colleagues in the United States of America. An investigation with R. Hervig and M. Guild from Arizona State University (ASU), of the boron isotope geochemistry of the upper mantle lithosphere beneath the Kaapvaal Craton of South Africa using in situ analysis by secondary ion mass spectrometry, revealed a greater range of $^{11}\text{B}/^{10}\text{B}$ isotopic variations in the mantle than has been previously recognised. These variations trace the geological path of water-rich fluids through the deep Earth, reflecting the complex series of processes that have affected the mantle root of our ancient continent. Results of the study were presented at the annual meeting of the American Geophysical Union (AGU) in San Francisco.

A collaborative project with R. Flowers and J. Stanley, from the University of Colorado, used U-Th/He thermochronology of accessory minerals in kimberlite pipes to deduce the timing of uplift and erosion of the South African land surface over the past 200 million years. The study showed that a major pulse of unroofing coincided with thermal events recorded in xenoliths from the underlying mantle, providing important evidence for a tie between surface and deep mantle processes. These results were published in the journal, *Geology*, and new data suggesting a spatially varying pattern of uplift with a second younger event related to drainage evolution were presented at the AGU annual meeting.

A new project to investigate the causes and timing of the oxygenation of Earth's atmosphere was launched in collaboration with several USA-based institutions with funding secured from the USA National Science Foundation. Prof Bell and Prof A. Anbar (ASU) co-convened and chaired a session at the annual Fall AGU meeting dedicated to this topic, titled: “Earth system oxygenation: an inside job?” and advanced a new hypothesis that oxidative titration of continental lithosphere by subducted fluids led to a progressive, but episodic increase in the redox state of recycled gases.

DST/NRF Research Chair in Law of the Sea and Development in Africa



Prof Patrick Vrancken

Before Professor Patrick Vrancken assumed his position as incumbent of the SARChI Chair in the Law of the Sea and Development in Africa on 1 July 2013, he continued to make a significant contribution to the development of the relationship between the South African Maritime Safety Authority (SAMSA) and NMMU in the field of marine and maritime studies. He also participated by invitation in the BRICS Maritime Trade Forum Durban in March, made presentations at the first Eastern Cape Maritime Conference in May and was appointed on the SAMSA Panel of Experts on Maritime Education and Training in June.

Although Prof Vrancken is focussing on the port legal frameworks of SADC States and State jurisdiction over foreign vessels in SADC ports during the first five-year cycle, he accepted an invitation to contribute to a fisheries crime symposium at the University of Cape Town followed by an Interpol fisheries crime workshop also in July. This led to him being appointed on the steering committee of PescaDOLUS, a new international research network supported by the Norwegian government and which focuses on the theoretical and practical challenges associated with a paradigm shift regarding the combatting of violations of fisheries law from a management approach to a criminal law approach.

Prof Vrancken continued his work on the 2050 Africa Integrated Maritime Strategy by, among others, introducing the instrument to South African maritime lawyers at the Annual Maritime Law Association Conference in August and examining the document, within the wider context of the African Union work, at an international piracy conference in September. At the same time, he made a significant contribution to the 2013 Conference of the African Association of National Maritime Administrations in October, before contributing to the CSIR/DST workshop on maritime technology held in Pretoria, as well as the further development of the scientific collaboration between NMMU and the Department of Environmental Affairs in November.

Prof Vrancken was also invited to participate in a book project led by the University of Pretoria and the Max Planck Institute for Comparative Public and International Law in Germany on *The Implementation of International Law in South Africa – Strengthening the Rule of Law by Following the German Model?*. This followed the submission of a substantial contribution to a new commentary on the *United Nations Convention on the Law of the Sea (UNCLOS)* due to be published by Oxford University Press in 2014.

A further achievement is the development of a website for the Chair (<http://lawofthesea.nmmu.ac.za>). The site not only informs the public about the researchers and the work done under the Chair, but also provides the widest range of resources and links on the law of the sea in Africa, available on the Internet. This initiative aims at making a contribution to addressing one of the main obstacles to research, and therefore development in Africa: the difficulty to access primary sources. At this stage, the site focuses mainly on South African and international resources and links, and is being continually kept up to date. However, the intention is to use the Chair's fast expanding research network on the continent to strengthen the comparative features of the facility, thereby making the site a very useful tool to support teaching and research in the law of the sea around the continent.

FirstRand Chair in Mathematics Education (SARChI)



Prof Werner Olivier

The FirstRand Foundation South African Mathematics Education Chairs Initiative is an outcome of the commitment of the FirstRand Foundation, in partnership with the Rand Merchant Bank Fund, to mathematics education in South Africa, with a special focus on teacher education and improvement of learner performance. It is being implemented in cooperation with the National Research Foundation, who administers the FirstRand Foundation South African Maths Education Chairs on behalf of the FirstRand Foundation. The FRF Chair in Mathematics Education at NMMU commenced in January of 2011 and was set up alongside three other university-based Chair positions nationally to help address the mathematics education crisis in the country.

The vision of the FRF Chair at NMMU is to:

- Improve the quality of teaching of in-service mathematics teachers at secondary schools;

- Improve the mathematics results (pass rates and quality of passes) in previously disadvantaged secondary schools;
- Research sustainable and practical solutions to the mathematics education crisis; and
- Provide leadership in mathematics education by increasing the dialogue around solutions for the mathematics education crisis.

The FRF Chair programme centres around the research and development of modern off-line teaching and learning models for NCS mathematics that are compatible with the challenging circumstances in the majority of schools in South Africa. The aim is to create innovative teaching and learning platforms and access to effective mathematics scaffolding support for both teachers and learners at the FET level. The past year saw the consolidation of a comprehensive off-line techno-blended teaching and learning model (TBM) for the secondary school system. This model was developed over a period of five years and now covers the complete NCS mathematics school curriculum at FET level. A number of innovative and exciting components are included in the model to assist teachers and learners in classrooms and elsewhere. These include flexible access to dynamic visual NCS mathematics video and PowerPoint lessons and syllabus content via mobile phones. The model allows for flexible and integrated use of calculator emulators, laptops and Android Tablets as part of the teaching and learning of mathematics. Specific components of the TBM model also aim at a broader agenda of harnessing modern mobile technologies for effective Mathematics support and to popularize the study of Mathematics and Science in secondary schools.

In 2013, the educational use of mobile technology to support the learning of school Mathematics became a reality when the FRF Chair programme managed to add new and innovative layers of independent curriculum support for Mathematics learners via Mxit. A pilot Mathematics Olympiad competition project, which ran exclusively on the Mxit phone system, was successfully implemented (for the first time in South Africa) in the Eastern Cape Province in June of 2013. The Mxit-based competition project will be extended to also include Physical Sciences in 2014 and will be offered to learners on a country-wide basis. A second mobile application was developed in 2013, which allows cost-effective and independent learner access to curriculum aligned Mathematics self-tests and feedback via the Mxit mobile system. Both Mxit-based Mathematics support platforms currently represent exciting additional components of the techno-blended teaching and learning models for Mathematics that are being researched.

A number of key school-based and other implementations of teacher and learner projects served as a living laboratory to inform a trans-disciplinary research and development agenda that is linked to the FRF Chair programme.

These include:

- Structured tablet assisted incubation of top Grade 11 and Grade 12 learners with potential from a number of districts in the Eastern Cape Province;
- Accredited skills upgrade of in-service secondary school teachers and FET college lecturers;
- Focused interventions to improve the content and technology pedagogy of NCS Mathematics subject advisors; and
- A GeoGebra-based professional development programme for in-service Mathematics teachers that is affiliated with the international GeoGebra institute that is based at Cambridge University, UK.

The R&D programme of the FRF Chair at NMMU also houses a number of postgraduate projects and collaborates with a number of other Mathematics engagement projects based at NMMU. Active project collaboration and links exist with national and provincial stakeholders in education. These include the Department of Basic Education in the Eastern Cape, the MERAKA Institute (CSIR) and various private sector partners.

GMSA Chair of Mechatronics



Prof Igor Gorlach

Professor Igor Gorlach has been the holder of the GMSA Chair of Mechatronics since its establishment in 2009. This past year has seen several milestones achieved by the Chair, with 2013 marking the completion of the first five-year phase of the agreement, as well as the signing of a three-year extension of the Chair. Additionally, 2013 saw a growth in project outputs and scope of activities for the Chair.

Automotive manufacturing and supplier operations are a key sector of the local industry, particularly within the Eastern Cape. The GMSA Chair of Mechatronics was established to leverage on the potential benefits of linking industry and academia within the inter-related fields of automotive and mechatronic engineering. The aim of the Chair is to foster a collaborative partnership between academics and students in the University environment and practising engineers in industry.

Although the primary partnership exists with General Motors South Africa, the Chair has strong links to other industrial partners and research institutions, with the objective to develop innovative solutions throughout the inter-disciplinary field of mechatronic engineering. The Chair functions to initiate and conduct both research and industry-based engineering projects.

In line with the objective of linking industry and academia, several projects with close ties to General Motors South Africa are undertaken by mechatronic engineering students each year. In 2013, three BEng students completed industry-based projects for GMSA, ranging from testing and validation equipment for use on a production line to error-proofing measures for aiding production personnel with assembly tasks. Undergraduate students also presented a variety of designs for the manufacture of a part manipulator to aid productivity and ergonomics on one of GMSA's production lines. In addition to benefiting industry, these projects provide invaluable practical experience for students.

An on-going project for the GMSA Chair has been the design and manufacture of an Automated Guided Vehicle (AGV) targeted as a cost-effective automation solution for use in industry. These mobile robots function as automated tuggers for tasks such as in-plant material collection and delivery. Two MEng students have worked on the project, and 2013 saw GMSA ordering two AGVs for implementation in their Struandale plant in 2014. In addition, the Chair has been working with the Innovation Support and Technology Transfer Offices on the project, and TIA sponsorship is anticipated from 2014 to further develop plans for commercialisation of the AGV. Continuing research and development activities on this project are taking place.



Prototype AGV undergoing testing.

The GMSA Chair also has a number of research collaborations with international universities and research institutions. In addition to continuing collaborations in the fields of robotics and machine tool modelling with partners in Germany and Italy, a new collaboration was established with the University of Luxembourg. This collaboration relates to advanced manufacturing technologies in general assembly, and included a research visit from Luxembourg to GMSA's Struandale plant in January. In a shift from the automotive sector, the Chair also signed a five-year agreement with the Energy Efficiency Specialisation Centre at UCT to conduct collaborative work on a major project for Eskom. The project aims to deliver sustainable improvements in Eskom's generation, transmission and distribution energy efficiencies. The first phase of the GMSA Chair's involvement focuses on the modelling of the control of coal-fired power generation plant processes and systems.

VWSA-DAAD International Chair in Automotive Engineering



Prof Udo Becker

The VWSA-DAAD International Chair in Automotive Engineering collaboration between the Nelson Mandela Metropolitan University (NMMU), Volkswagen South Africa (VWSA) and the German Academic Exchange Service (DAAD) has once again shown its worth through a number of successes achieved in the 2013 – 2014 financial year. The current three-year contract extension will conclude on 31 March 2015.

Masters candidate, Mr Marc Hochheuser, completed his MEng (Masters in Mechatronics) through the VWSA-DAAD Chair and was awarded the prestigious honour of "Top Masters Candidate at NMMU". Several NMMU and German exchange students have already registered to complete their postgraduate studies through the VWSA-DAAD Chair in 2014.

The close relationship with the VWSA Product Engineering Department continued to flourish, as several undergraduate projects were undertaken at the Uitenhage Plant. The majority of these projects were done by German exchange students from either Reutlingen- or Ostfalia University, with the "Rattle Roller" for the testing of vehicles being the most significant.

After the success achieved with the very first combustion engine, NMMU Racing vehicle (DibaOne), the racing team embarked on an exciting journey to design and build an Electric Racing vehicle, which was dubbed DibaE. The new electric vehicle motor is powered by Lithium Polymer batteries, targeting 0-100 Km/h acceleration in under 4.7 seconds.

Due to the high cost associated with building a Solar Car and a lack of

sponsorship, the VWSA-DAAD Chair in collaboration with the relevant project managers have decided to cancel the project. The project manager and students involved with the Solar Car team have, however, embarked on a new and exciting project, which entails the design and construction of an Eco-Car.

NMMU engineering students once again benefitted from the close relationship the University has with Ostfalia University, with Professor Schmidt presenting a one-day workshop on "Recyclable Materials" at the University. Professor Schmidt has been involved in several highly successful "green" related projects done for VWSA, which have included determining the recyclability of the Polo; the implementation of a waste flow management process; and determining the carbon footprint of the paint shop.

Projects were also done for VWSA as part of NMMU final year BEng projects. Students were afforded the opportunity to showcase their projects to VWSA Head of Product Engineering, Mr Tom Du Plessis, and his management staff. Mr Thomas Wilm and Mr Martin Dalemann from VWSA once again played an active role in ensuring the success of the 2013 BEng projects.

The major objective for 2013/2014 was to increase the level of research and innovation projects. These projects were done for VWSA, and were performed by final-year Mechatronics students.

Temperature Controlled Test Box for VWSA Weathering Tests

The overall aim was to design a temperature control system to monitor the temperature inside weathering test boxes being used by Volkswagen (VWSA) to carry out weathering tests in which the life cycle behaviour of components are simulated.



Weathering testing box for VWSA.

Development of a Low-Cost Line Following Automatic Guided Vehicle (AGV)

The aim of this project was to design and prototype a low-cost line following Automatic Guided Vehicle (AGV) for Volkswagen South Africa. The AGV will be used to deliver parts and materials within the manufacturing and assembly areas.



Final AGV carrying component shelves.

Development of a GPS - Navigated AGV for Agricultural Purposes

The aim of this project is to develop a GPS navigated AGV that can be used for agricultural purposes.



Final AGV design.

Automated Test System to Measure Hot- Spots in Automotive Headlights

The project topic describes the need to develop an automated test system that will be used to detect the presence of hot-spots in automotive headlights. The aim was to investigate, design and create a system to detect these hot-spots.



Photograph of the experimental setup in full sunlight.

Development of a Mechatronic Transmission Control System for the Drivetrain of the K71 Project

The overall aim of the study was to develop a transmission control system to enable shifting operations in the K71 drivetrain. To influence the dynamic driving properties of a Formula Student race car positively, the system had to allow a short shifting time. Other relevant characteristics were the weight of the system and the energy supply.

NMMU / Ostfalia University Exchange Programme

The NMMU has had a very fruitful relationship with the University of Ostfalia over the past few years with both staff and students benefitting from the student and staff exchange programme, which was established in 1998.

Each year, the exchange programme allows for undergraduate students to complete a five-month internship period at the partner university. This allows students the opportunity to interact with other students and also learn more about another culture. A total of 19 students from Ostfalia- and Reutlingen University completed their internship period through the VWSA-DAAD Chair at NMMU in 2013, with the majority of the students assigned to various projects involving industry partner, VWSA. These students worked closely with NMMU engineering students to successfully complete allocated projects.

NMMU engineering students once again benefitted from the close relationship the University has with Ostfalia University, with Professor Schmidt presenting a workshop on "Recyclable Materials" at the University. Professor Schmidt, Dean of the Automotive Engineering Faculty at Ostfalia University, has been involved in several highly successful "green" related

projects completed for VWSA, which have included determining the recyclability of the Polo; the implementation of a waste flow management process; and determining the carbon footprint of the paint shop.



German exchange students.

HIV and AIDS Education Research Chair



Prof Naydene de Lange

The HIV and AIDS Education Research Chair, located in the Faculty of Education at Nelson Mandela Metropolitan University (NMMU), was initiated in 2009. The Chair aims to promote research and engagement within educational settings in general and within poor communities in particular. The role of the Chair is to provide academic leadership, conduct research, publish, supervise postgraduate students, ensure academic engagement, and facilitate learning processes within the field of HIV and AIDS. The fourth year has been exciting and generative, building on the work of the previous years (see website, <http://www.nmmu.ac.za/RCE>). Prof Naydene de Lange, holding the current Chair position, focuses on using visual participatory methodologies in addressing gender and HIV and AIDS issues, and integrating HIV and AIDS into the curriculum.

There are several research and engagement initiatives:

HEAIDS HIV and AIDS Education Community of Practice

The 2013 annual HEAIDS Education Community of Practice (CoP) meeting was held at Salt Rock, north of Durban, on 7 and 8 October. The CoP draws together teacher educators from the 23 higher education institutions. The teacher educators are nominated by their deans, who also fund their travel and accommodation. The commitment reflects the support of the deans in the integration of HIV and AIDS in the teacher education curriculum. Thirty-three teacher educators participated in the CoP meeting, with the theme of *Digital Spaces and HIV and AIDS integration*. Prof Dennis Francis, Dean of Education (UFS) and Chairperson of the Education Deans Forum, the keynote speaker, presented a provocative paper, *“Looking back vs. looking to the future”: Teaching sexuality education, Implications for teacher education*.

Digital media for change and well-being:

This project is framed by the critical need for innovative approaches to policy making in relation to the safety and security of girls and young women, particularly in the context of high levels of sexual violence and HIV and AIDS. While sexual violence is a global issue, the study specifically explores ways in which the participation of young women in a democratic society could be, and indeed must be, transformative. On 4-5 October 2013, a small group of young first-year women education students, hailing from the rural areas of the Eastern Cape, came together for a research workshop with Prof Naydene de Lange (NMMU) and Prof Relebohile Moletsane (UKZN).

The first phase of the project engaged the young women students in “cellphilms” making and focus group discussions, in relation to various issues that are associated with young women and sexual violence in the age of AIDS.



Girls viewing their cellphilms.

One of the envisaged outcomes of the project is to inform policy change, contributing to addressing sexual violence at university. The second phase of the project, where the issues raised in the cellphilms will be used to generate policy posters and action briefs, will continue in early 2014. This project feeds into a larger project, *Networks for change and well-being: Girl-led “from the ground up”* policy-making in addressing sexual violence in Canada and South Africa (SSHRC/IDRC, 2014-2020), led by Claudia Mitchell and Relebohile Moletsane.

Digital Voices of rural teachers in South Africa:

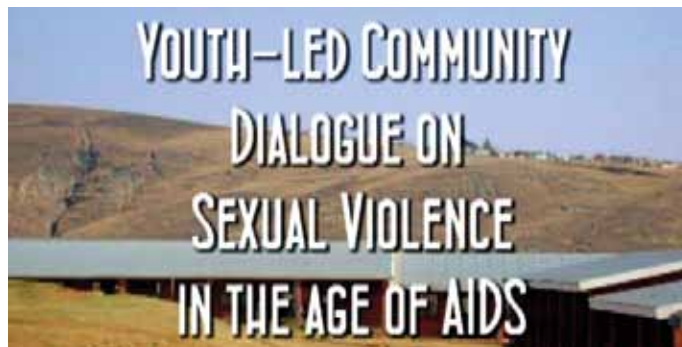
Digital Voices asks two key questions: what difference can the participation of rural teachers make to deepening an understanding of youth sexuality and HIV and AIDS; and how can these meanings be translated into more

nuanced understanding and treatment of critical social issues in community-based programmes and policy? This study aims to identify the ways in which the voices of rural teachers in two provinces of South Africa particularly hard hit by the AIDS pandemic (KwaZulu-Natal and the Eastern Cape) can become more central to meaning making when it comes to identifying and addressing critical issues of youth sexuality in the age of AIDS.

Not leaving data in the dark:

The project is premised on the idea that Social Science research in a South Africa-ravaged by various socio-economic ills, but in particular by HIV and AIDS should be pushing innovation in search of ways in which research could make a difference. One key way of doing this is by fully engaging participants themselves throughout the research process in new ways as knowledge producers, knowledge users and disseminators of new knowledge. Keeping in mind that research data has a limited life, that published research findings have a limited audience (mostly academic) and seldom reach the community, this proposed project is organised around the idea of “not leaving data in the dark”, but rather making it accessible to communities.

The project explores this in two ways: one, through extending the data in an already existing digital archive by linking it to other data sets to make “big data” (social science researchers often hear that large scale studies are more important than smaller studies); and two, through extending the community engagement with an already existing digital archive through such practices as participatory archiving, participatory analysis and re-use and re-mix of data, in addressing HIV and AIDS.



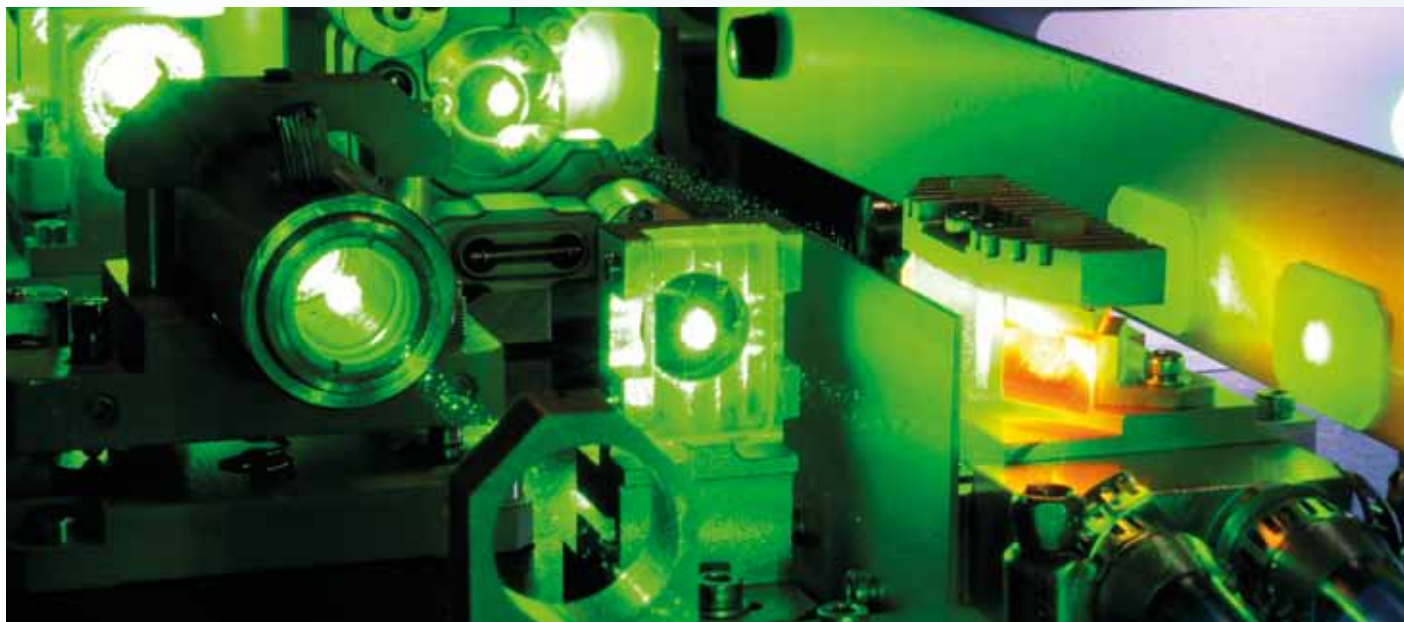
The video production.

The video will be used by the teachers to initiate community dialogue on gender-based violence in the community. They have also been invited to initiate a dialogue and engage with rural communities in Greyton and Pholela, in the *Networks for change and well-being: Girl-led “from the ground up”* policy-making in addressing sexual violence in Canada and South Africa.

Pre-service teachers talk about social justice across cultures:

This project focuses on identifying issues of social justice education from pre-service teachers’ perspectives based on their own lived experiences as students and pre-service teachers. The project straddles two universities and two countries, NMMU in South Africa (with Prof De Lange) and DePaul University in Chicago, USA (with Prof Monkman). Eight pre-service teachers at NMMU and four pre-service teachers at DePaul participated in this project, and it culminated with video conferencing between the two groups of participants on November 15.

Research Entities



Research entities are intended to position NMMU at the forefront of national and international research in relation to the institutional research themes. Research entities contribute towards the establishment of a vibrant research and innovation culture by creating a research environment that fosters and enhances multi-/inter-/cross-/trans-disciplinary research.

During 2013, there was a re-alignment of research entities resulting in some research institutes and research centres dissolving and re-emerging as research units, resulting in 28 registered research entities. At the highest level were institutes (two), followed by centres (seven) and units (nineteen). The entities fulfilled their mandates successfully during 2013 by producing high-level outputs in the following categories: peer-reviewed journal articles, books and book chapters, conference proceedings, Masters and Doctoral graduates, and patents.

- Peer-reviewed journal articles - 169
- Books and book chapters - 26
- Conference papers - 288
- Masters and Doctoral graduates - 118
- Patents - 5

NAME	LEADER	FACULTY
INSTITUTES		
AEON – NMMU Earth Stewardship Science Research Institute	Prof Maarten de Wit	DVC: Research & Engagement
InnoVenton: Institute for Chemical Technology and Downstream Chemical Technology Station and its sub-entities	Prof Ben Zeelie	Science
CENTRES		
Built Environment Research Centre	Prof Winston Shakantu	EBEIT
Centre for African Conservation Ecology	Prof Graham Kerley	Science
Centre for Energy Research	Prof Ernest van Dyk	Science
Centre of Expertise in Forecasting	Prof Igor Litvine	Science
Centre for High Resolution Transmission Electronic Microscopy	Prof Jan Neethling	Science
Telkom Centre of Excellence and its sub-entities	Prof Janet Wesson	Science
UNITS		
Action Research Unit	Ms Elsa Lombard	Education
Cyclic Peptide Research Unit	Prof Pieter Milne	Health Sciences
Drug Utilisation Research Unit	Prof Ilse Truter	Health Sciences
Family Business Unit	Prof Elmarie Venter	Business and Economic Sciences
Friction Processing Research Unit	Prof Danie Hattingh	EBEIT
Coastal and Marine Research Unit	Dr Derek du Preez	Science
Intercultural Education Unit	Prof Nonnie Botha	Education
Integrated Environmental and Coastal Management	Dr Derek du Preez	Science
Labour and Social Security Law Unit	Prof Adriaan van der Walt	Law
Labour Relations and Human Resources Unit	Prof Dave Berry	Business and Economic Sciences
Research and outreach Unit for Technology Education	Dr Hannalie Lombard	EBEIT
Science, Mathematics and Technology Education Unit	Prof Paul Webb	Education
Sustainability Research Unit	Prof Christo Fabricius	George
Unit for Applied Management Sciences	Prof Elroy Smith	Business and Economic Sciences
Unit for Economic Development and Tourism	Prof Richard Haines	Business and Economic Sciences
Unit for Lean Process Development	Dr Karl van der Merwe	EBEIT
Unit for Professional Ethics	Prof Cecil Arnolds	Business and Economic Sciences
Unit for Visual Methodologies for Social Change	Prof Naydene de Lange	Education
ENTITIES REPORTING TO THE DEPUTY VICE-CHANCELLOR: RESEARCH AND ENGAGEMENT		
HIV and AIDS Research Unit	Dr Jill von der Marwitz	DVC: Research & Engagement
Centre for the Advancement of Non-Racialism and Democracy	Mr Allan Zinn	

INSTITUTES

AEON - Earth Stewardship Science Research Institute

AEON-ESSRI provides a university-wide research and educational environment to seek consilient knowledge and engagement amongst earth and life sciences, engineering, resource economics, human, and cultural sciences through application and dissemination of Earth Stewardship Science (ESS). It will foster cutting-edge, internationally-connected, science and analytical learning using advanced tools and technologies in an environment that fosters solving complex problems through transdisciplinary science to explore sustainability for people and planet, particularly in Africa.

ESS is a new, broad intellectual field (discipline) in tune with contemporary global perspectives of the world and its complexities; it provides a far broader focus of study than that of "Climate Change", "Sustainability Science", "Development Studies", "Earth, or Global, Systems Science", "Conservation Management", "Ecosystem Analyses", etc. Its consilience approach seeks a deeper understanding of humanity's effect on the planet — that is accelerating along an exponential curve. This should give NMMU a leading research and engagement edge in people and planet issues of both local and global significance; and has the potential to make a major impact on the way Africa manages its (natural) resources - and how it responds to the many pressures on diversity, environment, and society; and how it relates to poverty and well-being.

Ultimately, the aim is creating an Africa-wide centre for ESS, with global participation that promotes co-curatorship and co-ownership across the continent, possibly through its flagship programmes "Iphakade" (Xhosa - observe the present and consider the past to ponder the future), and Africa Alive Corridors.

The scope of AEON-ESSRI is to foster cross-disciplinary and trans-disciplinary research to develop and implement ESS (one of the University's institutional research themes); to encourage greater inter-disciplinarity within NMMU where appropriate and suitable; to catalyse multi-mentorship of students, and change emphasis from simple information transfer to deeper understanding and intellectual synthesis through exploration. Solving complex problems linked to: earth resources, for example valuation of changing ecosystems; groundwater and energy (geothermal, unconventional hydrocarbons, renewable); state-of-the-art chemical forensic research; geo- and bio-engineering through mimicry of Nature; numerical analyses and computer simulations/applications; rural outreach and development programmes. A central task will be to explore, with a high degree of certainty, how to best differentiate natural from Anthropogenic changes in Earth-Life-Health systems, and to use this knowledge to assess, economically evaluate and buffer disruptive global changes induced by humans that directly affect these systems, but especially Africa.

Today's strongly connected, global networks have produced highly interdependent systems of exchange (people, money, food, knowledge, ideas) that we do not understand, cannot control well, nor are able to

evaluate their risks with the degree of certainty to avoid huge societal costs. A theoretical aim of ESS is to search for something fundamental about the dynamics of complex natural and social systems, about how such complex systems emerge, dissipate and interact at different scales about risks of systemic instabilities and signatures of resilience in systems: and how systems sometimes bounce back, yet at other times take unexpected turns, with or without external forces. ESS will explore these quests in trans-disciplinary ways, using examples taken from our planet, its ecosystems, its organic life, and human cultures, to learn more about interactive processes with their myriads of feedbacks.

AEON is the lead institute for UNESCO's ANESI programme (African Network of Earth Science Institutions) for Southern Africa.

Highlights and activities for 2013:

There was a TopoAfrica workshop held, which jointly organised by AEON and Université Rennes 1 (France) at the NMMU Saasveld Campus in George, 20-25 January 2013.

TopoAfrica is a project for the reconstruction and quantification of the past topography of Africa over the last 250 million years. A key focus of the project is the reconstruction of the past topography of Africa (with spatial dimensions of 500km or more) through numerical models using a geo-referenced multiple datasets coupling geology with sediment production and transport. The workshop was attended by 50 delegates from France, Germany, USA and RSA.

The Karoo Shale Gas is a research programme developed by AEON-ESSRI and initially proposed to the Eastern Cape Government in April 2013. This would provide the Eastern Cape government with an independent scientific monitoring capability (through ESSRI Baseline studies) in framing its policy and strategic approaches to the massive potential development associated with the prospective resource that is shale gas. A dedicated Karoo Shale Gas website – www.karooshalegas.org was setup in February 2013. During October-December, Prof M de Wit spent research and development time at MIT in USA to engage with the Terrascope Programme and consolidate an exchange visit with MIT students to NMMU in 2014. He also visited shale gas fracking and production sites around Pittsburgh, Pennsylvania, as well as discussions with technical and management staff at Halliburton. This has resulted in first-hand knowledge of the shale gas industry.

AEON manages a R6.1 million Earth system science research and capacity building projects within the national Global Change programme in South Africa. In 2013, the five peer-reviewed scientific and technical publications were published and the total number of students supported in ten South African institutions was 181 (43 PhD, 89 MSc, 49 Honours – including 51 students that graduated during 2013), of which there were 19 from NMMU. The total number of international rated peer-reviewed scientific and technical publications published by AEON at NMMU was five; and the AEON publication number at the end of 2013 stands at 116. The programme was extended for another three years until 2016. For more details about the 20 research programmes and national and international participation, see: www.inkaba.org.

InnoVenton

Leader: Prof Ben Zeelie



Prof Ben Zeelie

For InnoVenton, the year 2013 was dominated by three significant activities, namely the introduction of the Diploma in Chemical Process Technology as a formal programme within the Institute, the filling of the SARCHI Chair position in Microfluidic bio/chemical processing and the roll-out of the first Research and Development activities within this activity; and the developments within the Microalgae-to-Energy project. All of these developments are the direct efforts of the Institute to respond to specific strategic interventions and plans set at the start of 2010, including the shift in focus to include more Teaching and Learning activity into InnoVenton's offerings to provide a more stable financial basis in future, and shifting its Research and Development focus from more, smaller projects into much fewer, larger projects.

Financially, InnoVenton has managed to maintain a sound position, mainly carried by the substantial financial support received through the Microalgae-to-Energy project, the Technology Stations programme of the Technology Innovation Agency, and funding for the SARCHI Chair activities. The past year also saw a significant increase in the financial support towards Institute activities, these being mainly directed at supporting the introduction of the SARCHI Chair activities and a strategic intervention to support the introduction of the Chemical Process Technology programme.

In the Microalgae-to-Energy project the main focus was on the completion of the pre-feasibility/basic engineering study by Hatch Goba, which required a huge input. This interaction also led to several new developments in terms of microalgae cultivation (new reactor design patented) and Coalgae® processing (patented). Possibly the most important development is the low temperature pyrolysis of Coalgae® to produce a high quality light crude oil and a high-value clean coal. In the SARCHI Chair activities the main focus has been on the refurbishment of the research laboratory, recruiting the first three Doctoral students, and promoting the Chair activities locally and internationally. A direct result of the latter is the request by Fine Chemicals Corporation for the development of a new continuous-flow process for the production of an existing pharmaceutical active compound.

Demand for InnoVenton's assistance and expert services through its

engagement activities remained relatively stable during 2013 with a slight increase in turnover. Planned activities around the analysis and certification of manganese ores from the PE harbour in collaboration with Bidvest Logistics were delayed, and as a result the planned financial target was not achieved. Several automotive companies, however, showed renewed interest in the analytical and testing capabilities of InnoVenton and with a capital injection from the TIA towards specific testing equipment, we expect to see a significant growth in this area.

CENTRES

Built Environment Research Centre

Leader: Prof Winston Shakantu



Prof Winston Shakantu

The Built Environment Research Centre (BERC)'s scope of activities ranges from showcasing the NMMU Built Environment research brand, seeking and engaging in funded built environment research and supervising and promoting research partner funded Masters and Doctoral students. In 2013, the Centre's efforts in supervising and promoting the Construction Industry Development Board (cidb) funded Masters and Doctoral students reached a critical milestone in that all the students under that funding completed their proposal development stage and presented their research endeavours at a research colloquium attended by representatives from the funding body. A particularly noteworthy development was the completion and submission of the Centre's debut PhD output. Tim Froise, one of the beneficiaries of the Centre's cidb funding completed his research on *Building information modelling as a catalyst for an integrated construction delivery culture in South Africa*.

At the beginning of the second semester of 2013, the Centre in conjunction with the School of the Built Environment and the cidb-NMMU Centre of Excellence, introduced a "Built Environment Colloquium Series". Run over the University lunch hour from 12h00 to 13h00 in the Centre of Excellence, the series provides a safe environment in which the concept of a "community of scholars" has been utilised to provide a platform for delivery of research intentions, ongoing research, completed Masters and

Doctoral research proposals, and proposed journal and conference papers. The series has attracted external attention from some professional bodies seeking continuous professional development (CPD) avenues for their members. To this end, a number of individuals who are corporate members of their professional bodies have loyally attended the colloquiums. A beneficial consequence of the attendance of practicing professionals to the colloquiums has been the unintended industry experience based contributions to the presentations. The industry attendees have, through their contributions to the presentations brought their professional experiences to bear on the discussions, and thus enriching the colloquium experience and creating a win-win result for academics, students and practitioners. To some extent therefore, the colloquium series has become somewhat of an engagement activity and outlet.

In the year under review, Centre members also published 32 conference and seven journal papers. The subject matter covered in the papers is eclectic, depicting the kaleidoscopic nature of the research activity in the Centre.

Centre for African Conservation Ecology

Leader: Prof Graham Kerley



Prof Graham Kerley

The goals of ACE, as articulated in the ACE Strategic Framework (2012-2016), are summarised as: 1) to maintain a high level of research output as measured by scientific publications; 2) to provide high levels of postgraduate research training, as measured by the number of postgraduate students graduating or conducting their research training under the auspices of ACE, and by the number of new students attracted to work under ACE; 3) to build ACE's international recognition, with particular emphasis on increasing its profile in Africa; and 4) to continue to provide scientific information and advice, specifically in fields of the ecology and conservation of African ecosystems, especially in the Eastern Cape.

The following strategies have been adopted to achieve these goals: 1) identification of research opportunities within the core themes of the ACE Strategic Framework, and developing research proposals to undertake these; 2) raising research funding to conduct existing and new research projects;

3) prioritising the generation of research publications; 4) supporting postgraduate students through providing research opportunities, advice and facilities, as well as raising bursaries; 5) maintaining a web site to project ACE's profile; and 6) providing advice to a range of stakeholders from government to private reserve owners.

Key to this has been the adherence to the Strategic Framework document that guides ACE's activities for the period 2012-2016.

Highlights and special achievements:

A highlight of 2013 was the publication of the book *Historical Incidence of the Larger Mammals in the Free State Province (South Africa) and Lesotho*, with Andre Boshoff and Graham Kerley as authors. The book was published by the Centre for African Conservation Ecology, Nelson Mandela Metropolitan University.

The following students and staff received awards in 2013:

Prof Vincent Kakembo was promoted to Full Professor. Hayley Clements, Doug Makin and Sean Welman were awarded their MSc degrees, *cum laude*. Hayley Clements was awarded the S2A3 Bronze Medal for the best MSc. Liaan Minnie won the award for the best PhD talk at the annual Zoology Department Mini-Symposium. Adriaan Grobler won the best student presentation: Thicket Forum 2013, Grahamstown.

The following research outputs were generated as summarised below:

Refereed Scientific Publications	19
Popular Articles	3
Books	1
Book chapters	2
Reports	5
Conference Presentations	13
Postgraduate MSc degrees completed	4
Postgraduate MSc degrees in progress	10
Postgraduate PhD degrees completed	3
Postgraduate PhD degrees in progress	13

Centre for Energy Research

Leader: Prof Ernest van Dyk

The Centre for Energy Research (CER) aims to serve the energy needs of the region by conducting applied energy research and training students. Its staff and students make a valuable contribution to energy research and the energy field in general in South Africa. The CER also conducts contract research with several local and national companies.



Prof Ernest van Dyk

Highlights and special achievements during 2013 were:

- The CER established a photovoltaic testing lab (PVTL) – one of just two in the country. The PVTL was set up to provide high-level training for students in a professional testing laboratory environment and, at the same time, offer a much-needed specialised service to the local photovoltaic industry. The lab is currently managed by PhD student, Jacqui Crozier.
- The CER has acquired the country's first outdoor electroluminescence (EL) imaging camera. In the past, solar farmers would purchase a consignment of photovoltaic modules, and then send a representative sample of these delicate panels to a photovoltaic testing lab (PVTL) for testing to ensure they functioned at the level promised by the supplier. Thanks to the new EL imaging camera, one of the tests that could previously only be performed in a darkened lab environment can be done in the field – and the tests are the most accurate yet. The EL camera captures images of light, not visible to the naked eye, that are emitted by the photovoltaic panel to reveal material defects.
- Even in cloudy weather when there is no direct sunlight, a unique CER-patented hybrid Concentrator Photovoltaics (CPV) system can still produce power. The hybrid CPV system makes use of both concentrator cells (onto which direct sunlight is concentrated using lenses) and conventional PV panels to capture diffuse light. The use of both concentrator and conventional cells – combined with solar tracking – results in a much higher energy yield than conventional flat plate PV systems.
- The Twerly™, an innovative “off-the-grid” street light that harvests both sun and wind energy, was in the final stages of development in 2013 (prior to commercialisation in 2014). Harvesting both sources of energy ensures that it still comes on at night, even after days of rainy, sunless conditions – which is one of its main advantages.
- The CER tied a wind turbine to the University's power grid – a first for the University, one that follows on the successful linking of solar energy to the campus grid last year. The R45 000 turbine, which was manufactured in the United States and produces up to 2.8kW of electricity, is state-of-the-art, with built-in “intelligence”. Researchers call it a “plug and play” turbine – meaning you plug it in and it takes control. It downloads data to a PC via a wireless link and even emails daily reports to the physics and mechanical engineering researchers monitoring its activity.

- First public showcasing of Coalgae™: Innovative algae technology that could turn millions of tons of coal dust wasted annually in South Africa and elsewhere into high quality clean coal together with a bio-oil blend for transport fuels, was publically demonstrated for the first time. The pioneering technology was developed by NMMU's institute of chemical technology (InnoVenton) over the past three years, with funding from the Department of Science and Technology (DST) and the Technology Innovation Agency (TIA). Plans for the commercialisation of this technology are well advanced with the design of commercial-scale production facilities by international engineering company Hatch-Goba currently underway.
- Four articles were published in international journals.
- One international and ten national conference papers were presented.
- Three MSc students (one with *Cum Laude*) and one MCom (*Cum Laude*) student graduated.

Centre of Expertise in Forecasting (COEF)

Leader: Prof Igor N. Litvine



Prof Igor N. Litvine

The goals and targets set by the Centre of Expertise in Forecasting is to: 1) serve the forecasting needs of SA through training students and conducting applied research; 2) generate meaningful research that is applicable in the South African and international context; 3) to be a highly recognizable centre of expertise in forecasting world-wide; 4) raise the research profile of the Faculty of Science; 5) offer training and development opportunities for graduate students; 6) promote interdisciplinary research across the boundaries of faculties and departments; 7) complete all active commercial projects as per deadlines/contracts; 8) apply for at least one international and one national research grant; 8) complete at least two Masters degrees; 9) complete at least one PhD degree; 10) register at least one new PhD student; 11) complete at least three Honours projects; 12) apply for at

least one new commercial research project; and 13) register at least one Postdoctoral Fellow.

The strategies employed to achieve the said goals and targets during 2013 were to seek qualified external members (for Researcher Associate appointments) and to seek cooperation with international partners.

The following outputs were produced during the period under review:

- The completion of Phase 1 of the Forced Outage Rates project for Eskom.
- The Paired Comparison models for ambient temperature were jointly done with the University of the Free State.
- Two papers were published in international accredited journals.
- Two members of the Centre completed PhD degrees, namely: Dr MC du Plessis and Dr Danie Venter.
- Five Honours projects were completed.
- The 2013 phase of the TEST (ESKOM) project was completed: Risks mitigation in electricity generation and supply (Tertiary Education Support Program, Eskom Foundation).
- A two day workshop/training session was held on how to use Mathematica.

Highlights and Special Achievements

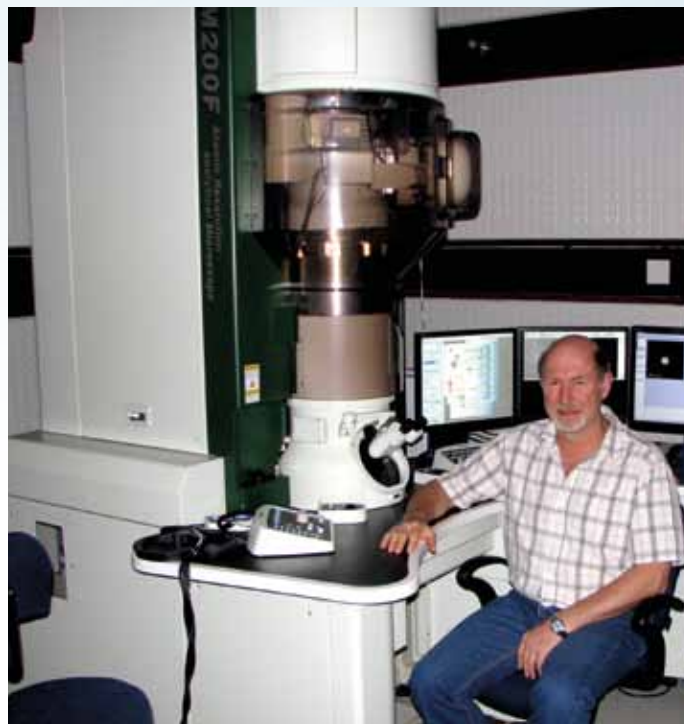
The Centre hosted a successful three day Third National Forecasting Conference in September at the Summerstrand Hotel. The Deputy Director, Dr MC du Plessis completed his PhD. Now the Centre has six members who holds Doctoral degrees (three permanent staff, one Postdoctoral Fellow and two research associates). The Director of the Centre (Prof IN Litvine) spent one month sabbatical at the University of Lorraine (Nancy, France). Two Professors from France (University of Lorraine and University of Lyon) visited our Centre for two weeks. Prof IN Litvine was appointed as a member of the examination Committee for PhD defence at the University of Lorraine - December 2013.

Centre for High Resolution Transmission Electronic Microscopy

Leader: Prof Jan Neethling

The research year under review, 2013, was an exciting year with publications in high impact factor journals, successful local and international collaborations and widespread recognition for the high quality of research outputs generated. The research conducted at the Centre covers both fundamental and applied industrial research and the use of high resolution transmission electron microscopy in solving important technological problems for researchers in South Africa and abroad has been successfully demonstrated.

The Centre for HRTEM held its gate review for the forming stage on 20 June 2013. It was agreed by the reviewers that the Centre sufficiently met the requirements for the forming stage and the Centre was commended on a job well done. Good progress has also been made with the development of postgraduate students and emerging scientists in materials characterisation using advanced electron microscopy techniques. One such case has been the extensive training in electron microscopy of a PhD student from the Centre for Materials Engineering at UCT.



Prof Jan Neethling

The Centre focuses on the application of high resolution and analytical electron microscopy techniques in the characterisation of strategic materials, down to the nano and atomic scale, in collaboration with local and international leaders in physics, materials science and engineering. The Centre focuses specifically on energy materials, minerals beneficiation and novel materials.

The successful collaboration with Idaho National Laboratory (INL) in the USA has led to the discovery of the mechanism through which radioactive metallic fission products can escape from the barrier coating surrounding the nuclear fuel particles. This radioactive release mechanism has been a mystery for about 36 years. Collaboration has also been initiated between the Centre for HRTEM and the Department of Materials Science and Engineering at the Ohio State University in the USA. The focus of the collaboration will be advanced electron microscopy techniques, materials modeling and titanium alloys.

Abstracts from staff and students from the Centre for HRTEM amounted to 47% of the total proceedings of the Annual Conference Microscopy Society of Southern Africa (MSSA 2013), with 16 first-authored and eight co-authored abstracts being presented at the Conference. Staff and students from the Centre for HRTEM won five prizes at the 2013 MSSA Conference, which included the FEI prize for the best publication in an internationally recognized journal, WIRSAM TESCAN prize for the most exceptional presentation at the Conference, SMM TECHNOLOGIES prize for the most innovative technique in microscopy used in SA, WIRSAM SCIENTIFIC prize for the best paper presented by a student author, and the ANASPEC prize for the best paper or poster using microscopy to address an industry-related problem.

Telkom Centre of Excellence

Leader: Prof Janet L. Wesson



Prof Janet L. Wesson

The Nelson Mandela Metropolitan University (NMMU)/Telkom Centre of Excellence mission is to serve the needs of the Information and Communication Technology (ICT) industry by developing highly qualified Masters and Doctoral graduates through applied research in collaboration with its industry partners. Four (4) of the CoE staff members have NRF ratings: Prof Andrew Leitch (C-2), Prof Ernest van Dyk (C-2), Prof Tim Gibbon (C-2), and Prof Janet Wesson (C-3).

Highlights and special achievements during 2013 were:

Distributed Multimedia Applications Unit

Prof Wesson and Prof Kotze were co-chairs of INTERACT 2013, which was hosted in Cape Town, South Africa from 2-6 September 2013. This was the first time that the IFIP INTERACT Conference took place in Africa. Simone Beets presented a full paper titled, "Managing Personal Information across Multiple Devices: Challenges and Opportunities. Human-Computer Interaction". Michael Kyazze won the prize for the best Masters proposal presentation at the African Masters Consortium, which was part of INTERACT 2013.

On 7 September 2013 Prof Wesson was interviewed in Cape Town and a brief video was recorded. The media team from NRF visited the Department of Computing Sciences on Monday, 9 September 2013, to capture more video footage on the campus, students and CoE-related projects.

The THRIP UbiServe project was placed third in the category "Innovation and Benefit to Industry Partners" at the dti Technology Awards function held at the Durban Exhibition Centre on 15-17 October 2013. Prof Janet Wesson attended the Digital Europe ICT 2013 event in Vilnius, Lithuania, starting 5 November 2013, as part of a small SA delegation. (<http://ec.europa.eu/digital-agenda/en/ict-2013>)

Optical Fibre Research Unit

"Modelling and experimental investigation of advanced PMD, nonlinear effects and modulation format on the performance of next generation optical fibre networks" is a collaborative project uniquely linking four African university research groups: Optical Fibre Research Unit (NMMU), University of Eldoret (Kenya), Makerere University (Uganda), and University of Carthage (Tunisia).

The Unit has had particular success in investigating the interaction between PMD, nonlinear effects, Raman amplification and polarization influences.

In June 2013, the OFRU was involved in the Science Discovery Week outreach programme hosted at NMMU.

Prof Xianbin Yu of the Technical University of Denmark, world-leading researcher in the field of high speed photonic and wireless links, visited NMMU for a research visit from 23-31 August 2013. During September, Prof Andrea Galtarossa of the University of Padova in Italy visited NMMU.

The Unit continued working with the Square Kilometre Array (SKA) technical design team. In February 2013 and August 2013 two experimental workshops were held at NMMU between the optical fibre researchers and the SKA technical design team. Prof Tim Gibbon attended an SKA International engineering meeting of the SKA held in Manchester in October 2013.

In July 2013, the OFRU visited schools in East London and Queenstown where it presented a show entitled: "Light, Lasers and Telecommunication". Organised by the Faculty of Science, the show was designed to promote science, education and NMMU.

Photovoltaics Unit

The PV Unit is also actively engaged in promoting public awareness of the importance of renewable energy technologies.

Prof EE van Dyk was elected deputy chair of the Renewable Energy Task Team of the Nelson Mandela Bay Business Chamber whose task team promotes renewable energy business and projects.

Dr FJ Vorster was re-elected Chair of the Applied Physics Forum of the South African Institute of Physics.

Dr RD Schultz received an award from the Applied Physics division for Best PhD poster presentation on "Spectral Shaping and Sub Cell Modeling of the Current Density of a HCPV Device as a Function of Operational Conditions" at the 58th Annual SAIP Conference, University of Zululand, in July 2013.

Mr MA Benecke received an NRF award for academic excellence (MSc *Cum Laude*) at the Energy Postgraduate Conference 2013 Gala Dinner, Cape Town, in August 2013.

A Provisional Patent Application filed on 27 September 2013, No. 2013/07270 entitled "Concentrator Photovoltaic Apparatus".

The Photovoltaics Unit collaborated with colleagues from the Physics Department at Oldenburg University in Germany on topics in PV and wind energy. New collaboration initiatives have been forged between a Spanish PV testing and verification laboratory, ENERTIS.

Through the PV Spoke funding model from the DST, the CER and the Photovoltaics Research Unit maintain strong links to the CRSES based at Stellenbosch University and the Fort Hare Institute of Technology.

HIV and AIDS Research Unit

The Unit is currently focussing on the establishment of two research niches in HIV and Nutrition, and research in HIV and Indigenous Knowledge Systems. Research partners include the Department of Health, the University of the Free State, Eastern Cape Aids Council (ECAC), Automotive Industry Development Centre (AIDC), PE Hospital Complex, and NMMU partners (Departments of Dietetics, IT, Campus Health Services and Pharmacy).

All the nutrition studies conducted have been supported by successful applications from the NMMU Research Themes Grant.

International research

The Unit has established collaboration with the College of Health Professions and Social Work in the USA. The project proposal has been submitted to the UNAIDS. It is entitled: "Health Seeking and the Continuum of Care among Black South African Lesbian, Gay and Bisexual Hate Crime Victims and HIV and AIDS".

Institutional research

Institutional research is ongoing. The team has been investigating food security, nutritional status, health status, wellness and the impact of learning outcomes among infected NMMU students as well as risk behaviour among NMMU students. The data obtained from these studies enabled the Unit to put posters across NMMU campuses, conduct a seminar with students at South Campus. They also published three journal articles in accredited journals and also have an HIV Learning Site for students.

Regional research

A research study entitled: Socio-Economic Risk factors of HIV Risk Behaviour and Household Food Insecurity in informal Settlements in the Eastern Cape was conducted during 2012 - 2013. A multi-centre research study that was conducted in 2012 - 2013 on growth velocity of HIV-infected and HIV-negative children with moderate malnutrition supplemented with ready-to-use supplementary food (RUSF), resulted in two poster presentations.

Collaborative research is being undertaken between ECAC and the Unit to determine the socio-economic risk factors of HIV- infection in informal settlements in the Eastern Cape. This data analysis is currently being done in collaboration with Dr Danie Venter of NMMU's Unit for Statistical Consultation. The Unit has further designed an HIV on-line learning site for NMMU students in collaboration with Dr Hermien Johannes from

the Department of Teaching Development at NMMU. In line with the development of the Nutrition Research niche in HIV, the Unit has developed a blended learning site on anti- retroviral therapy and renal disease in HIV infection, which allows dieticians to obtain part of their annual compulsory CPD points.

Collaborative research has also been initiated with the NMMU Dietetics Department in risk behaviour among NMMU students and the IT Department regarding the development of a nutrition screening mobile application. Collaborative research is further being done with the Automotive Sector (AIDC) on the Knowledge, Attitude, Practice and Belief (KAPB) studies in selected companies in the Eastern Cape Province and the PE Hospital Complex. The Unit is currently negotiating with the AIDC on the use of an application, which, will be designed with the collaboration of the ICT Department. A pilot study is envisaged on site for 2014. The Unit is also currently involved with the search of Technologies in Indigenous Knowledge Systems (IKS) and Technological Theories that speaks to IKS. This has presented an opportunity to cascade and strengthen interdisciplinary and interfaculty collaboration on research projects regionally, nationally and internationally.

Other Projects

Collaboration with NMMU IT Department and Prof Darelle van Greunen regarding the establishment of an AIDS portal. AFRO AID has sponsored the site and the contents and it will be managed and updated by the MRC Home Page, being managed by Dr Thomas Hilmer populating information for the Unit.

The HIV&AIDS Research Unit received ethics approval from REC-H during April 2013 for the above mentioned project. Data from the online survey in May 2013 among students (n=619) are currently being interpreted and the first article by Dr Gresse is in peer review with an accredited journal.

One of the main outcomes were that more than 30% of the sample reported episodes of binge drinking (more than 4-5 drinks in 2 hours for females and males respectively) in the last 12 months, which may negatively impact on other health risk behaviours (including HIV risk for intoxicated females especially). Binge drinking in this study was also significantly associated with poor eating habits and lack of exercise, which may influence quality of life and learning outcomes.

As there may be a small window of opportunity to impact on behaviour of first year students, the researchers have requested to repeat exactly the same survey among first year registered students during the second week of February 2014. No changes were made to the approved proposal.

Centre for the Advancement of Non-Racialism and Democracy (CANRAD)

CANRAD was launched on 23 March 2010 and has been functioning for four (4) years at NMMU. The Centre functions across the University working with Faculties, Divisions and Entities. It was instrumental in growing "Diversity Week" to "Diversity Month" during August as programming around Vision 2020 and the values of the University gained traction. The Institutional

Culture Enlivening Process currently in its second year is also a project managed by CANRAD.

In mid-2013 with the arrival of a new Entity, the “Centre for Integrated Post School Education and Training” a “Socially-Engaged Scholarship Forum” was launched jointly by CANRAD-CIPSET with two high profile engagements, namely:

- Dr Sibongile Muthwa leading discussion on “Women on the margins of the formal economy: Implications for social research, policy and engaged scholarship” on 24 June 2013.
- Profs Fred Hendricks, Lungisile Ntsebeza and Kirk Helliker on “Ongoing Land Inequalities in South Africa: What role for engaged scholarship”.

Both events attracted a cross-section of academics and graduate students from within NMMU as well as a small, but significant, contingent of organic intellectuals and activists in the Metro. By the end of 2013, CANRAD had also been given Ethics Clearance for starting the Research Study “Investigating intuitive understanding of non-racialism and framings of citizenship in the NMMU”.

While the research output has been modest in 2013 with Allan Zinn’s Chapter in *The search for quality education in post-Apartheid South Africa: Interventions to improve teaching and learning* (Sayed, Kanjee and Nkomo; Editors, HSRC Press, 2 May 2013), other academic endeavours have served to profile the Centre both nationally and internationally.

CANRAD led and organized the highly successful (150 attendees) “The Life and Times of Neville Alexander” International Commemorative Conference at NMMU from 6-8 July 2013. Speakers came from as far afield as Namibia, Germany, USA and the UK as well as from 11 universities in South Africa. The Conference Report is being finalised.



Conference participants broke into song as the Conference came to closure singing one of the multilingual songs much loved by Dr Neville Alexander.

CANRAD continues to build strong networks and partnerships locally, nationally and internationally to give effect to an important NMMU and national mandate in South Africa today. After successfully hosting the Anti-Racist Network in Higher Education (ARNHE) administratively for three (3) years, CANRAD handed over the reigns to the University of the Free State’s

Institute for Social Justice and Reconciliation. CANRAD also initiated the establishment of a four (4) Centre/Institute collaborative network that includes WITS, UKZN and UFS.

The CANRAD Seminar Series held monthly from February - November 2013 also attracted leading intellectuals as speakers, both nationally and internationally. The CANRAD Resource Centre contains over 50 DVD Titles (Dialogues/Seminars/Colloquia/Conferences). This valuable data source continues to be utilized by staff and students across faculties at NMMU



Enver Motala responds to the keynote address by Pallo Jordan on “The National Question Reconsidered” with Lybon Mabasa and Pallo Jordan seated at the table and the Dean of Education, Denise Zinn, in the role of facilitator.



A conference participant in a reflective moment reading a chapter in the tributes booklet “Enough Is A Feast”.

Research Capacity Development

In addition to its regular annual programme of research workshops, research capacity development (RCD) has undertaken two new initiatives, namely: a programme aimed at supporting younger staff in accelerating the proposal phase of their doctoral studies, as well as a process to enhance the research supervision capacity at Doctoral level.

Doctoral Proposal Development Programme

The NDP identifies the low percentage of academic staff who hold PhD degrees as one of the chief constraints to knowledge production within higher education. Currently, the percentage of academic staff who hold a doctoral qualification stands at 49%. Although this percentage compares favourably with the national average of 34%, the NMMU's Vision 2020 aims to increase the staff qualification profile to 60% by 2020. During 2013, the NMMU, in partnership with SANTRUST, initiated a Doctoral Proposal Development Programme. The programme accommodated 20 staff members who were able to develop and refine their doctoral proposals with inputs from local and international academics.

Doctoral Supervision Programmes

Parallel to the doctoral candidate programme offered, the respective doctoral supervisors attended two supervision workshops during the course of the year.

A further 26 NMMU staff members also participated in the NUFFIC-funded Strengthening Doctoral Supervision Programme. The latter programme is a significant national initiative to build the quality of doctoral supervision within the higher education sector.

Next Generation Initiative (NGI)

Since 2010, the NMMU has piloted a programme to grow the next generation of academics. This modest investment has seen the following scholars participate on the programme during 2013:

- Ms Samantha Kahts [Human Movement Science; Faculty of Health Sciences]
- Mr Bulelani Sokopo [Mathematical Statistics; Faculty of Science], and
- Mr Madinda Mashinini [Engineering; Faculty of Engineering, the Built Environment and Information Technology].



From left to right: Mr Madindwa Mashinini (Mechanical Engineering); DVC: R&E, Prof Thoko Mayekiso; Ms Samantha Kahts (Human Movement Science); and Mr Bulelani Sokopo (Mathematics).

Funding Support for Emerging Researchers

Internal funding opportunities available for staff at the University consists of two main streams of funding to its emerging researchers, namely: the Teaching Replacement Grant (TRG) and Research Development Fund (RDF).

The Teaching Replacement Grant (TRG) is a support intervention specifically targeted at the following:

1. Enabling space for staff to write for publication in DHET accredited publications by providing financial support towards teaching relief and thus reducing their teaching load for a specified period of time.
2. For teaching relief for staff members who have been granted research leave by their faculty committee in order to compile a research proposal for a higher degree.
3. Creating space for staff to spend dedicated time in completing specific aspects of research towards improving staff qualifications (after approval of a proposal).
4. Facilitating the opportunity for staff who are in the final stages of completing further qualifications in obtaining funding towards a research sabbatical.

RDF funding is available to NMMU staff members conducting research, who do not/are unable to access external grant funding. **The RDF is intended to provide funding primarily in three categories:**

- Seed funding for researchers who are in the process of studying towards a further academic qualification;
- Interim/bridging funding for new staff at the NMMU who have not been able to transfer their research funds from their previous employer; and
- Initial funding for researchers who have recently completed their doctoral qualification.

The basis of the application is a research project plan, which should give the reviewers sufficient information to decide whether the project is feasible and will make a contribution to the NMMU's Research Strategy.

Postdoctoral Fellowships

During 2013, the NMMU hosted a total of 29 Postdoctoral Fellowships. The funders of the fellowships were as follows: NMMU Council, NRF, Claude Leon Foundation, CSIR, SASOL, MRC, and SANParks. **Postdoctoral fellows were hosted by hosts within the following academic disciplines:**

- Languages and Literature
- Physics
- Chemistry
- Zoology
- Mathematical Statistics
- Biochemistry and Microbiology
- Mechatronics
- Textile Science
- Environmental Ecology
- Marine Biology



Dr Alastair Potts

Dr Alastair Potts is a Plant Ecologist, whose primary interest is in vegetation history. This history spans decades to hundreds of thousands of years. At present, despite South Africa's fine tradition of research in the palaeosciences, the available palaeo-archives in South Africa are still insufficient for resolving the past climate or vegetation changes with any degree of satisfactory resolution. A constraint in this area is that there are not enough researchers to fully investigate the palaeo-archives available plus the South African environment was often unsuitable for fossil preservation.

"The vagaries of the preservation of artefacts and fossils also affect what we know about the past" (Sally McBearty: *Sharpening the mind*).

In his area of research, Dr Potts uses a range of different techniques to catch glimpses of windows into the past. For example, he uses DNA in plants to track their history, because genes tell the story of a lineages history. This field is termed Phylogeography. He also uses species distribution modelling to build a mathematical model of a species niche under current conditions and then project this model onto potential scenarios of past climate (these scenarios are usually based on simulated using global circulation models generated by international teams of climate scientists).

Dr Potts's interests have dovetailed with archaeologists studying human evolution along the South Cape Coast. Archaeologists are finding the earliest evidence of human cognitive evolution in this region. Up until relatively recently, the general line of thinking in archaeological circles is that humans became smart in Europe. However, this recent evidence supports the emerging hypothesis that humankind became cognitively human on our shores – some 130 to 160 thousand years ago, as evidence gathered in places like Pinnacle Point Cave and Diepkloof begins to suggest.

Dr Potts is working with a large inter-disciplinary project to produce a "Palaeoscape–Model". This works contrariwise to Archaeology. In this sense that here the approach is to reconstruct the landscape, detecting what were the forces that worked on early humans, and see how those forces impacted humans, and then using archaeological evidence to test this. To build such a palaeoscape model requires researchers from a range of disciplines such as climatologists, vegetation modellers, anthropologists, agent based modellers, and super-computer scientists.

By his own admission, Dr Potts says"I am a small cog among many developing the Paleo- landscape...."

A key challenge to the vegetation modelling has been to obtain funding to advance the research on generating paleo-climate data, which is a prerequisite on which to build the paleo–vegetation reconstruction. These vegetation models will then be tested against independent lines of evidence, such as pollen in palaeo-archives or genetic data.



Dr Marisa Botha

Dr Botha's research aligns to one of Nelson Mandela Metropolitan University's current institutional research sub-themes on "Democracy education, Human Rights and Democratization". It also falls under the NMMU Institutional Academic Focus Area entitled "Culture, Communication and Language" and aligns with the Language and Literature Department's research focus on "Identity and Marginality in South African Literature".

This 2011 theme, which still has a few ongoing projects in the Department, pays attention to the previously marginalised in society, while interrogating aspects of identity formation in the transitional South Africa as it is reflected in language and literature.

South Africa has made great strides towards building a united nation since its democracy in 1994. As a country with a traumatic past and as a multiracial, multi-ethnic, multicultural and multilingual society, the challenges faced to reach this ideal of a unified “rainbow nation” are many. Idyllically, our society should move away from the notion of an individual “I” to a collective “we” and from a distinction between “the other” and “us”.

Since 1994, the publication of life narratives has multiplied exponentially mainly due to the previously marginalised adding their newly acquired voices to the South African metanarrative. As time has passed the genre of autobiography has increasingly supplied counter narratives expressing discontent with the status quo. Recently there has also been a surge in the publication of exile and prison narratives. The memoir is also still a popular mode of life writing in which the narrator represents the past and the present within a framework of their choosing. Literature is considered a reflection of the socio-political and socio-cultural concerns of the public. It is especially the counter-narratives and narratives of traumatic experiences, which suggest that the journey to a unified South African community is still in progress. Despite various studies regarding our country’s traumatic past and attempts at reconciliation, there are still unresolved issues. The work on trauma regarding the Truth and Reconciliation Committee testimonies has been beneficial to all concerned, but misunderstandings on topics of culture, religion and history, accompanied by racial and ethnic prejudice, are still rife.

It has been established that by accessing the obsessive or traumatic memories in the process of writing a narrative to be therapeutic. It has also been found that the reader of such narratives also experiences a degree of healing. As such, these narratives are the ideal research material to analyse for its representation of cultural memory, as well as for the role memory plays in the reconstruction of a traumatic past. This study is engaged in creating new knowledge that benefits our understanding of the world.

Ubuntu and Respect for diversity have been the key values. NRF funding enabled her to attend conferences, and to network with like-minded people.

Dr Romeo Gamatham researches the great advantages offered by fibre optics, which has led the world to using optical fibre for communication or data transmission. This all became a reality in 1970 when Corning proved the feasibility of using optical fibre instead of copper as a transmission medium. The fibre optics field has grown rapidly since. These developments have provided the world with a great solution; however, because of the rapid development, formal education as well as practical skills in fibre optics has lagged behind.

After graduating from the University of Namibia he completed his Honours degree in Physics at the Nelson Mandela Metropolitan University (NMMU). His interest was in optics; hence he pursued a Master’s degree in optical fibre communication at NMMU, starting in 2007.



Dr Romeo Gamatham

After obtaining his Master’s degree, he pursued a Doctorate in the same field. The Master’s degree provided him with a wide range of skills pertaining to equipment and introduced him to all the particular issues in fibre optics. However, his Doctorate was much more challenging and would provide him with more in-depth knowledge of fibre optics.

In 2009, he started his Doctorate with a research visit to the Technical University of Denmark (DTU), in Denmark. At DTU he joined the Metro Access group where they were studying ultra-wideband (UWB). The aim was to generate an ultra-wideband signal in the optical domain, transmit the signal over the fibre, then convert it to a radio frequency (RF) signal to be transmitted in the air and finally detect the RF signal with an antenna. The frequency spectrum of the RF signal was required, by the FCC, to fit within a frequency mask, where the boundaries were set by the FCC. The Metro Access group came up with an optical injection technique that generated a fifth order Gaussian signal that met this condition. The DTU stimulated his growth in research immensely as the research standard at the DTU is amongst the highest in the world. He was one of the co-authors of an international conference paper as well as a journal article.

Thereafter he returned to NMMU where he started working on the challenging topic of cross phase modulation (XPM). XPM is an optical non-linear effect. It appears at high optical powers and can lead to crosstalk. The aim of the project was to investigate the effects of XPM on a probe signal when in the presence of a high powered co-propagating pump signal. Many well planned experiments were carried out to prove the theory behind the XPM phenomenon. Changing the pump signals power has an effect on particular characteristics, such as the state of polarization of the probe signal. He effectively demonstrated these effects as well as their resultant impact, which may have deleterious effects on PMD compensators in wavelength division multiplexing (WDM) systems. The findings of this work were presented at various local conferences. Further the results of the work were published in an accredited international science/engineering journal.

Before starting his write-up for his Doctorate degree, he had the opportunity to visit the University of Padova in Italy for five months in 2009. The research group at Padova, under the leadership of Prof Galtorossa, a renowned expert in fibre optical communication, have a

long history in polarization mode dispersion (PMD) and nonlinear effects. The aim of the project for the duration of his stay was to experimentally prove counter propagating Raman polarization attraction. Spontaneous Raman emission has been used for Raman amplification in optical fibre. Recently, researchers realised that it is possible to use Raman amplification to achieve attraction of a probe signal to a single state of polarization by making use of the high power pump signal. The case of co-propagating polarization attraction has been demonstrated through simulation and experiment. Researchers from the Padova research group worked on trying to achieve counter-propagating polarization attraction experimentally. Results from the experimental work for counter-propagating Raman polarization attraction were published in the *Optics Express* accredited international academic journal, where he was listed as a co-author. This experience further enriched his knowledge and research experience; with respect to equipment, research topics, research strategy, and general academic research skills.

He returned to South Africa and completed his Doctorate in 2012.

The title of his Doctorate thesis is: "Nonlinear Effects with a Focus on Cross Phase Modulation and its Impact on wavelength division multiplexing optical fibre networks".

His Doctoral thesis received highly favourable remarks from local and international external examiners and reviewers.

In 2013, he registered as a Postdoctoral Fellow at NMMU in the Physics Department with the Optical Fibre Research Unit. His main responsibilities include assisting students with their research projects, demonstrating how to operate instruments, discussing student's projects with them for the purpose of finding a solution or to generate new ideas, proofreading student's academic papers, maintaining as well as fixing research equipment, assisting in sourcing and buying new research equipment, and overseeing directed functions in the laboratory.

Additionally, he conducts his research in the background, which is centred on FTTH. Fibre to the home (FTTH) has finally come to Africa. In the United States of America, Europe and Asia FTTH has already been implemented. The FTTH networks provide smart cities, which offer large bandwidth to users. Africa's unique socio-economic challenges and sprawling population distribution requires network technologies, architectures and business models applicable to the African case in order for FTTH to be a success in Africa.

The above summary of his academic journey is testament to his broad knowledge and skill in optical fibre. Over the years he has learned about the major effects an optical signal may encounter when being transmitted over the fibre namely; attenuation (absorption, scattering, bending loss), dispersive effects (modal dispersion, chromatic dispersion, polarization mode dispersion) and nonlinear effects (self-phase modulation, four wave mixing, cross phase modulation, Raman and Brillouin scattering). Dr Gamatham has a good understanding and experience in performing PMD measurements using different techniques, for example interferometry, Jones matrix eigenanalysis, polarimetric PMD measurement techniques and femtosecond analysis.

He has experience in working with optical transceivers and receivers, specifically in directly or indirectly modulating an optical signal and detecting it with a photodiode to be analysed on an oscilloscope. He can confidently perform and analyse bit error rate measurements. He also has sufficient experience in working with optical amplifiers. He has sound knowledge on how to control measure and analyse the state of polarization of an optical signal. Furthermore, he is familiar with a broad range of optical fibres and has an understanding of their differences as well as their advantages and disadvantages. He is proficient in MATLAB and LabVIEW programming languages. He is also very familiar with the software package VPI transmission maker, which is listed as one of the requirements. This software package is used in the laboratory to build optical fibre network test beds and to perform virtual experiments.



Ms Janine Christian

Ms Janine Christian focus area is Co-operative Governance and Ethics. The teaching and learning side of Co-operative Governance. However, she became part of a team developing teaching strategies for Diploma-type Accounting modules. This was collaborative research involving researchers from NMMU and Tshwane University of Technology (TUT). In the year under review, the team completed a literature review, and completed data collection. They will proceed to do benchmarking of the results that they are getting, to benchmark these against similar research done, nationally and internationally.

Trying to use blended learning, access to technology is a challenge. Trying to leverage economies of scale in order to get e-books. Funding is also a challenge, because a good number of students still have obstacles when it comes to funding their studies.

Excellence, which is one of NMMU's values, was the driving values. Students also need to get excellent service from their lecturers – the best possible service as it were.

Janine's advice for aspirant researchers is that you need to get started. It is somewhat of a daunting task to get started. Therefore, set time aside, to get started. Identify slots where you can set aside huge chunks of time. For example, taking your two hours, and building them to four, six or even eight hours, and taking this huge chunk of time to work where you are not distracted. It focuses the mind to work for a long time without interruptions.

It is important to call for help. Do not struggle too long on your own on a research challenge without eliciting help – someone else can come with a suggestion, or perspective, which opens your eyes and mind.

As a first time researcher, you need to spend some of your own time to get to research.



Mr Samuel Nzioki

Samuel Nzioki is working on the next phase of African political thought. Researching what the next generation of "sense makers", in the form of journalists and contributors to policy making, are seeing as the new paradigm. Since 1958, African political discourse seems caught in a time warp - its narrative stuck in neo-colonialism, and the sense of being oppressed.

The African plays from the position of victimhood, always confined to the idea of being oppressed. The agency of the African is therefore contained. His PhD research therefore explores.... "How we can exercise agency as Africans.... without waiting for validation from the colonial masters. There needs to be therefore a radical rethink about politics and economics. There is an urgent need to radically breakdown old thinking, and stop speaking the victim story."

His research is two-fold:

- Radical thinking of African political thought, with a finger pointing at Africans for complicity in perpetuating the victim story, and
- How do we create a new memory and a new paradigm?

It is important for Africa to stand up for itself. The works of political thinkers and researchers like Achile Mbebe are challenging Africans to take a close look at how we interpret African challenges. The African reality should make sense to our own selves first. It should be clear, when change is effected for example, that it is not just cosmetic change.

There is a dire need to..."rethink thinking" and create a new trajectory of African political thought. For example, whilst those outside Africa can perceive ethnicity as militating against democracy, Africans need to stand up and say..."there is nothing wrong with ethnicity". Ethnicity is not necessarily toxic to Africa. A balance should be kept in so doing not to present Africans as quaint relics of an era long past, as though to whet the cultural and political appetite of the western thinkers .

His research is therefore proposing a vary radical rethinking. How elections are perceived in Africa currently, should take a narrative that is outside the current critical canons.

The politics of patronage still plague Africa. Ghana struck oil on its land, but they continue to operate in the same old way, not thinking of new ways in which they, themselves, can extract this oil, and optimise the benefits for their own communities. He understands very well how a lot of African countries function, e.g. Kenya and Nigeria.

Attending overseas conferences, for example the one on "Media and Politics in Africa", held in London was key, as has been the funding to do research made available by the University.

Ubuntu has been key. Not in the denuded reductionist perception of "I am, because you are", but much more than that. Ubuntu is a spiritually-lived experience.

Samuel's advice to future researchers is that one should not do research for its own sake. "Undertake research that will make a difference. Understand that those who went before you, left you a legacy that you need to pass on to the next generation of researchers in a better way than you found it."



Ms Tarryn Rennie

Tarryn Rennie is an emerging researcher who has vast industry experience in Graphic Design as well as visual communication, nearing fifteen years in duration. Her area of focus is Experiential Branding. She is currently studying for her Master's degree, and benefitted from the Career Development Programme run by NMMU for emerging researchers. This programme was key in bolstering and boosting her confidence as researcher, but also enabled her to network with others.

Experiential brand activation is what she has been working on – in terms of looking at how brands can delight consumers. Located in the Department of Communication: Journalism, Media, Philosophy and Public Relations, she is able to take her research insights into class.

She has started presenting papers at conferences, and publishing in relevant journals in her field e.g. South African Journal of Art History (SAJAH).

Collaborating with Unisa, in terms of getting pointers vis-a-vis the post-graduate models that she teaches.

She further presented a paper at an international conference in Vancouver, British Columbia. During networking with other participants, she used the opportunity to benchmark the output of NMMU in terms of creativity in the design space.

She was granted three months sabbatical leave, which enabled her to consolidate most of the information that she required for her research project.

Her research is dealing with people's experiences, and how they respond to brands. For example, flash mobs lead to brand delight, and generate positive energy. Monitoring traffic towards certain brands in cyberspace falls under her purview in terms of experiential branding.

Social semiotics is the theoretical underpinning of what her research involves. Changing people's perceptions and behaviour, by the way ideas are visually interpreted can be quite exciting to observe. Tarryn advises aspirant researchers to be open and receptive to everything that is out there, be aware of what is going on around you. Over and above that, be impartial and unbiased, but simultaneously have a strong sense of ethics and commitment. Keep a journal to record ideas, and keep a scrap of paper, to record inspirations, because inspiration can come at any time, even in the wee hours."



Dr Marle van Eyk

Dr Van Eyk is working on extending the marketing mix within the game ranching industry. She points out in an article that "Conventional marketing mix [product, price, place, promotion] is inadequate for effectively marketing the offerings of game ranches". The extended marketing mix would therefore be inclusive of: people, physical evidence, process, packaging, performance, and personalisation. The crux is this: game ranchers need to think strategically, and make an effort to market their offerings – and be aware that they too are competing for consumers / customers. The game ranching industry can no longer afford to be complacent.

Publishing an article in a refereed journal, and attending international conferences in Germany and Italy set her on her trajectory – ably supported by an encouraging and experienced promoter. Highlights for her were workshop attendance with people who are experienced and learning from them.

Another key enabler for her has been attending the NMMU Career Development Programme, which focussed on research, teaching, community engagement, and leadership. She comments: “From such programmes, you get to know what is available. You network and you connect with people. [This really is a platform] from which you can launch your own career.”

Her main collaborator has essentially been her promoter, although as she attends conferences, she is meeting other scholars, with whom she will be engaging and creating opportunities for collaboration.

Within the Marketing Department there is a lot of support, and they have an “internal peer review” where they can read one another’s articles, and give one another feedback.

Dr Van Eyk’s tips to aspirant researchers are: be able to take constructive criticism, and grow from it; do not take it personally; take your research back to the classroom; be aware of industry needs; surround yourself with people who are supportive; and it is important to make time for research.

At this stage, Dr Van Eyk is promoting critical dialogue among students, and between students and lecturers.

The NMMU values of Integrity, Excellence, and Respect for diversity underpinned her approach to research.

The Scholarship of Engagement



Prof George de Lange
*Director: Academic Engagement
and Collaboration*

The traditional role of universities as society's primary generators and transmitters of knowledge is changing. Academic institutions form an important part of a highly complex learning society where discovery, learning and engagement are integrated activities that involve many sources of knowledge that is generated in diverse settings by a variety of contributors. This has resulted in a shift in the nature of university knowledge production, which includes trans-disciplinary and multi-disciplinary modes. Here knowledge is also being produced in the context of application, in addition to the more controlled context of an academic discipline and its paradigms. Technology has made access to knowledge, data, expertise and information widely available so that researchers now can draw upon dynamic, interactive knowledge networks external to the university. The expectations of the state, external stakeholders and broader society demand increased efficiency; as a consequence, the application and utility of knowledge produced by universities continue to gain momentum. One of the ways in which universities are responding to these expectations is through the Scholarship of Engagement and specifically through engaged research involving external partners.

One of the strategic priorities of NMMU is to position itself as an engaged institution that will contribute to a sustainable future through critical scholarship.

One of the strategic priorities of NMMU is to position itself as an engaged institution that will contribute to a sustainable future through critical scholarship. The University therefore ascribes to a holistic and systemic approach to engagement and views engagement as a fundamental idea and strategy infused into its core functions. Teaching and learning and research are enriched in the context of engagement, and engagement in turn is enriched through the knowledge base of the discipline being taught and researched. Its approach to engagement and scholarship is underpinned by the work of Boyer (1996) who postulated a much broader and holistic conceptualisation of scholarship. Instead of focusing exclusively on traditional and narrowly defined discipline – based research as the only legitimate avenue to further knowledge, Boyer's broader conceptualisation of scholarship proposes five interrelated dimensions of scholarship, namely: discovery, integration, application, teaching and engagement. The Scholarship of Engagement therefore consists of research, teaching, integration and application scholarship that incorporates reciprocal practices of engagement into the production of knowledge. It describes a host of practises cutting across disciplinary boundaries and the teaching, research and service and outreach functions of the university, involving academics communicating to and working both for and with their partners in the external community (Boyer, 1996).

Examples of engaged research activities include applied, project-based, action, participatory, collaborative and contract research as they relate to external partners and knowledge networks, which often takes place off-campus. Non-engaged research refers to basic research that is mainly campus-bound and laboratory-based.

Examples of engaged research activities include applied, project-based, action, participatory, collaborative and contract research as they relate to external partners and knowledge networks, which often takes place off-campus.

In addition to emphasis being placed on the development of a Scholarship of Teaching and Learning, the Scholarship of Engagement is advanced as a key element to enable the NMMU to respond and contribute towards the various communities it serves. Furthermore, the University supports the view that the Scholarship of Engagement is boundary spanning scholarship and that it can manifest itself as engaged scholarship in teaching, engaged scholarship in research, or engaged scholarship in outreach and service. It is viewed as scholarship guided by an engagement ethos that results in work connected in a coherent, thematic and scholarly manner. As the needs of external communities exceed the ability of the university to respond, specific priority and focus areas based on institutional expertise have developed, and this allows the university to maintain a balance between responsiveness and institutional autonomy.

Engagement is regarded as being scholarly when it requires the use, application and/or generation of knowledge that results from the scholarly work of an academic in collaboration with external partners and stakeholders. Scholarship remains at the core of an academic's activities and their interaction is about extending the knowledge resources of the university. It is core to the academic's disciplinary commitment and is not an "add on" to normal academic work in that it cuts across teaching, research and service in an integrated manner. The engagement activities of staff also often occur along a continuum in integrated "bundles of activity" forming part of a research-teaching-service and outreach nexus, resulting in teaching, research and service feeding into one another.

Through its Engagement Conceptual Framework, the NMMU recognises four, often integrated categories of engagement. These four categories are:

- Engagement through community interaction and outreach;
- Engagement through professional- and discipline-based service provision;
- Engagement through teaching and learning; and
- Engagement through research and scholarship.

The University's engagement recognition and reward criteria specifically reward engagement activities that have scholarly basis and place emphasis on scholarly outputs linked to the integration of all four categories of engagement. The variety of research-based scholarly outputs produced through the Scholarship of Engagement include books, book chapters, monographs, articles, reviews, papers, presentations, artistic and creative

endeavours, policy analysis, technical reports, artefacts, and impact studies.

There is a growing acceptance by researchers of a problem-driven approach to epistemology and methodology that is characteristic of contemporary scholarship and specifically of engaged scholarship. The language of engagement suggests an element of reciprocal and collaborative knowledge production that is unique to these forms of scholarship. Engagement requires not only communication to public audiences, but also collaboration with partners in the community in the production of knowledge. Researchers are moving away from acting upon a community or community-based problem to answer a research question. The researcher is now rather working side-by-side with various communities, practitioners and external knowledge networks to define the questions and methods, implement the research and to disseminate the findings. This requires of academics to create collaborative partnerships and organisations. If successful, this may lead to regional and national solutions and innovations that are sustainable and that will build the capacity of partners to address challenges and to find solutions and to build on opportunities.

There is a growing acceptance by researchers of a problem-driven approach to epistemology and methodology that is characteristic of contemporary scholarship and specifically of engaged scholarship.

Gibbons postulates the notion of the "agora", which comprises a "problem-generating and problem-solving environment" populated by academics and other "publics", including practitioners, designed to generate "socially robust knowledge", that is knowledge that will be demonstrably reliable in a broader range of contexts and not just in laboratory conditions (Gibbons, 2006). This process usually involves a process of "interaction between experts and others, each of whom may inhabit different worlds to interact effectively in transforming a problem into a set of research activities". Gibbons (2006) describes the problem around which they engage as a "boundary object" and the space where engagement happens as a "transactional space" involving two-way interaction. Internally engaged scholarship brings together academic staff and students in networks and structures called research and engagement entities designed to coordinate, inform, support and link staff to engagement opportunities. These structures provide a platform to academic staff to connect with partners, to facilitate quick responses to funding opportunities and to promote collaborative and multidisciplinary partnerships across the institution as well as to opportunities for participation in multidisciplinary campus-community partnerships.

As a comprehensive university, the combination of traditional university disciplinary knowledge with the technologies of the previous technikon, NMMU is able to respond to the demand for knowledge that transcends original disciplines and is able to provide multiple and interdisciplinary knowledge and technology that is required to solve particular problems in society. Institutional engagement enabling structures in the form of research and engagement

entities (Units, Centres and Institutes) promote closer working relations and partnerships between the University and the various communities it serves. The faculty-based and centralised identities are not only changing interactions between the University and its external communities, but also in terms of institutional spheres of government, industry and the University with specific reference to knowledge and technology transfer and the changing nature and role of the University in innovation and development.

As a comprehensive university, the combination of traditional university disciplinary knowledge with the technologies of the previous technikon, NMMU is able to respond to the demand for knowledge that transcends original disciplines and is able to provide multiple and interdisciplinary knowledge and technology that is required to solve particular problems in society.

A growing sign of the trend towards the Scholarship of Engagement is the number of research-based engagement projects registered in 2013 on the NMMU Engagement Management Information System, the number of entities that were established over the past three years, as well as the increase in engagement-related research outputs of entities. By focussing on the alignment of their academic strengths with business and industry and critical community issues on a local, regional and in some cases a national level, some of the faculty-based entities are developing specific teaching and research agenda's resulting in increased funding support and research productivity. Externally-driven state incentive schemes such as the Technology and Human Resources Industry Programme (THRIP), the programmes run by the Technology Innovation Agency and externally funded faculty-based structures such as Technology Stations and Industry funded and SARCHI funded Chairs have further contributed towards increased interaction and the formation of partnerships between the University and the various communities it serves.

A growing sign of the trend towards the Scholarship of Engagement is the number of research-based engagement projects registered in 2013 on the NMMU Engagement Management Information System, the number of entities that were established over the past three years, as well as the increase in engagement-related research outputs of entities.

The faculties and entities most active in producing scholarly outputs through engagement and collaboration with external partners and knowledge networks include:

- Faculty of Education (Science Mathematics and Technology Education Unit, the Action Research Unit, the HIV and Aids in Education Chair);
- Faculty of Engineering, the Built Environment and Information Technology (eNtsa, Volkswagen International Chair of Automotive Engineering, General Motors Chair of Mechatronics, Advanced Mechatronics Training Centre, Centre for Community Technologies);
- Faculty of Science (InnoVenton, Centre for African Conservation Ecology, Institute for Coastal and Marine Research, Sustainability Research Unit, Centre for Expertise in Forecasting);
- Faculty of Business and Economic Sciences (Unit for Economic Development and Tourism); and
- Centralised entities (HIV and Aids Research Unit, Earth Stewardship Research Institute, Centre for Post-School Education and Training).

Within the context of the integrated approach to engagement it is understood that engaged and non-engaged activities overlap, influence and contribute to each other and that a balance between the extent of engaged a non-engaged research should exist. Excellence in basic disciplinary research, however, underpins and remains an important prerequisite for the development of the scholarship of engagement.

The appropriate balance between these research activity types is set through a dynamic process of discussion and negotiations at institutional, faculty and departmental level. This dynamic interaction enables the University to adjust to changing circumstances and external pressures without losing its equilibrium. Meaningful engagement and engaged scholarship therefore requires an internal and external process of setting priorities through formal communication and the development of sustainable and long-term partnerships that are of mutual benefit and reciprocal in nature.

Meaningful engagement and engaged scholarship therefore requires an internal and external process of setting priorities through formal communication and the development of sustainable and long-term partnerships that are of mutual benefit and reciprocal in nature.

The House of Amajingqi joins hands with NMMU



Chief Sibongile “Ngwenyathi” Dumalisile of Shixini Great Place, Willowvale, a leader within the Xhosa Royal Kingdom and leader of the Amajingqi Traditional Council has, through his vision for his people, created opportunities and access to many opportunities for the 22 villages under the jurisdiction of the Amajingqi Traditional Council. In 2013, a Memorandum of Understanding was signed between the Amajingqi Traditional Council and NMMU. The primary aim of the collaboration is to not only create opportunities for research, but also active engagement in rural communities. In addition to that, the collaboration will bring about opportunities to develop rural entrepreneurship, give access to technology, and enhance the standard of education in the villages, to name but a few.

Earth Stewardship Science Institute

To date the collaboration included visits by members of the Earth Stewardship Science Institute under the leadership of Prof Maarten de Wit. Members of the Institute identified several opportunities in the natural beauty and environments around the three river outlets. These areas exhibit potential for limited, selected quality tourist development, and if marketed and developed with care, could attract limited, but high-paying tourists. Through a small investment, this can lead to job creation for a few local people and would ensure environmentally friendly behaviour and access to small-scale income opportunities.

Prof de Wit and his team identified several other opportunities that require further exploration. Some of these opportunities include the possibility of educational experiences through hands-on work in the rural area by postgraduate students. This can evolve into a rural laboratory for social learning and indigenous knowledge building for NMMU Earth Stewardship graduate students. In addition to these, an in depth field geological investigation will be launched along the coastal rock sequences to better understand the local geology relative to the shale-gas potential in the regional context of the Eastern Cape. In addition, it will entail the design of a GIS-based scientific database-management system for the area.



The natural beauty of the area suitable for tourism.

Rural Socio-economic Development

Subsistence farming is not uncommon in rural areas and Shixini Great Place is no exception. Geoscience-geography students are also researching the use of aquatic resources in rural livelihoods as part of a rural socio-development initiative. This initiative will not only focus on livestock farming, but also other forms that are suited to the soil types and availability of water in the area.

Govan Mbeki Mathematic Development Unit and Science support

The initial visit to the area allowed members of the GMMU to evaluate the needs of schools from a learner and teacher perspective in the village. Follow-up visits allowed the distribution of comprehensive resource material as well as onsite training for teachers on using tablet and netbook technology to support their teaching. This paved the way for two teachers from Dumalisile Senior Secondary School to attend the MATHSUP accredited programme and gain access to valuable resources.

The accredited programme, a laptop and TouchTutor resource materials were made available to the teachers in this school. As a result of NMMU interventions and requests to the Department of Basic Education, a total group of 30 Maths teachers from the Dutywa District (which includes Willowvale) were selected to do the 2014 MATHSUP programme. This includes the distribution of laptops and the TouchTutor Maths and Science support packages.

Career Guidance and Advice

Some 900 learners from schools in the 22 villages benefitted from an exhibition spearheaded by Marketing and Corporate Relations during 2013. Not only were learners afforded a glimpse of what is expected of them out in the workplace, but they also had the opportunity to ask questions regarding tertiary education and to receive first hand advice as to what they could potentially study towards.



Learners at the Career Day.

Technology Training

In partnership with the Chief of the Amajingqi, NMMU represented by the Centre for Community Technologies, have set up the first educational computer facility in this rural area. Currently, there are 14 PC's that are connected to the Internet making use of cellular technology. Prof Van Greunen and her team are working closely with the community of Amajingqi to offer suitable interventions using the technology. This is then also supported by the use of a solar charging station enabling the charging of not only laptops and Tablet PCs, but also cellular phones. Learners from the surrounding schools now receive computer literacy training every day of the week and have access to finding much needed information to complete assignments and access revision exam papers in preparation for the final matriculation examinations.



Chief Dumalisile receives the first Netbook PCs for the village from Prof Darelle van Greunen.

The computer facility not only boasts Internet access, but also printing facilities. Chief Dumalisile is leading by example as he has switched to the digital age and is seen using his tablet and technologies such as Skype to have meetings with potential partners around the globe. The digital age has also brought new opportunities to the aging parents of the Chief as well as other members of the community as they no longer have to travel for approximately 90 minutes to the nearest bank. They now make use of Internet banking and online transactions.

Future initiatives include the establishment of an annual cultural event to celebrate the unique culture of the Amajingqi Traditional Council. Such events will uniquely combine technology exhibitions with traditional dance and music as well as a food fare. As part of the Siyadala ("We are creating") Living Lab of the Centre for Community Technologies is uniquely combining applied research with engagement to use technology as an enabler in the lives of geographically challenged groups such as the members of the Amajingqi villages.



Mrs Dumalisile and a community member in the computer facility.



The elderly parents of Chief Dumalisile receiving training on how to do Internet banking from Yemisi Oyedele, a PhD IT student.

Socially Engaged Research



Mr Ivor Baatjes - Director: Centre for Integrated Post-School Education and Training.

CIPSET and Socially Engaged Scholarship

The Centre for Integrated Post-School Education and Training (CIPSET) is a Centre at NMMU that is currently implementing socially engaged scholarship through its work in the post-school sector – the Technical Vocational Education and Training Colleges, Community Colleges and civil society organisations involved in formal and non-formal education of youth and adults. The developing work of CIPSET attempts to inform policy and practice related to adult and community education (ACE), and forms the immediate context through which socially engaged scholarship is being developed as a demonstration of how the NMMU could be embedded through the work of such scholarship as the core of a transforming institution.

The core of the argument on which CIPSET's Community Education Programme (CEP) is based is the triple challenge of poverty, inequality and unemployment in our city; the unacceptably low levels of working-class participation in post-school education and the need for greater university involvement in community education and development. With the prospect of continuing high levels of unemployment and the deepening social crises in poor communities around poor social, educational and welfare resources, there is an urgency to connect ACE more strongly to local needs and problems, and to the interests and talents of community members. ACE, we argue, should be more closely linked to community development and community action.

Many youth and adults continue to suffer multiple disadvantages and a multitude of problems as a result of poverty, unemployment, poor health, hunger and inadequate shelter. Parents are also interested and concerned about their children's education, but their most pressing problems lie outside educational institutions, in the daily struggle of creating sustainable livelihoods and democratic community life characterised by often brave, resilient and resourceful ideas and practices in the face of the tremendous difficulties that result from an unjust socio-economic system. Alternative ACE programmes must be linked with community action that seeks to build a democratic society. In turn, community action to build a democratic society must inform community education and make ACE an essential component of community development and community events.

As a university-based socially engaged scholarship programme, the CEP aims to bring into existence adult and community education programmes that demonstrate what Community Colleges (CCs) could look like. In doing this work the programme recognizes the experience of people who are excluded from the formal labour market and makes explicit the global arrangement of power that shapes the relationship between education and training, the economy and society. It seeks to understand, from the perspective of poor and marginalised people, what kinds of knowledge and skills they consider worthwhile in building a more equal, just and sustainable society.

The purpose of this programme is also to inform the creation of CCs as sites for community education and training and community action through using a community participatory action research (CPAR) approach. The programme acts in support of emerging community-based education alternatives and aims to increase the space for such alternatives to take hold and become self-sustainable. Through building and sustaining mutually beneficial and truly collaborative partnerships with established community organisations, the project aims to establish a model for progressive adult and community education offered through CCs.

Working in the Community

The CEP commenced in 2013 following careful conceptualisation, which took into account the multitude of problems experienced by communities within which NMMU is located. CIPSET staff engaged in CEP, and members from the surrounding communities in Missionvale, constructed an approach to a community education and development model founded on a combination of PAR and Popular Education (CIPSET, 2013). Using a Freirian approach, the CEP designed a research process which is transparent, co-constructed, collectively negotiated based on the collective inputs and analyses of those involved in the CEP. The approach of the CEP is laid out in the Manifesto for Adult and Community Education (CIPSET, 2014). Its community mapping exercise, using transect walks by which to engage with communities, surfaced an understanding of a wide range of social issues in communities as well as their strategies in dealing with the realities faced by them.

Through this exercise, the CEP began to construct the framework for curricula which is rooted in, and reflective of, the daily and concrete experiences of people and communities. Through ongoing engagement and dialogue, the CEP is able to produce curricula that can be mediated using a variety of teaching methods and techniques, as well as in exploring a number of strategies to address community issues. Some of the activities and curricula of the CEP include community education events, a vast collection of community snapshots, which form the basis for constructing non-formal education programmes, digital stories, popular theatre, and the establishment of reading clubs. All these activities are connected to deepening the understanding of the social realities of communities and the production of educational resources for community as agents of their social action. The work of the CEP is in its infant stage and has begun to offer transformative possibilities at different levels. It has begun to: (a) engage with communities in the analysis of the issues that are important to communities; (b) mobilise communities to engage in seeking responses to existing social problems; (c) recognises the talents and capabilities of communities in addressing these; (d) opens up parts of the University to be directly involved in addressing social issues; and (e) informs government policy and practice in building community education programmes using a community-based approach.

Faculty of Arts

Creating tomorrow



■ School of Architecture

DEPARTMENTS

Department of Architectural Technology and Interior Design
Department of Architecture

■ School of Governmental and Social Sciences

DEPARTMENTS

Department of Political and Governmental Studies
Department of Sociology and Anthropology (incorporating History)

■ School of Language, Media and Culture

DEPARTMENTS

Department of Applied Language Studies
Department of Journalism, Media and Philosophy
Department of Language and Literature
Department of Public Relations and Communication Studies

■ School of Music, Art and Design

DEPARTMENTS

Department of Art and Design: Introduction Studies
Department of Applied Design
Department of Studio Art
Department of Music

| Dean's Overview



Ms Mary Duker
Acting Dean: Faculty of Arts

The Faculty of Arts enjoyed a highly productive 2013. Research outputs from conference proceedings, accredited articles and book chapters showed an increase over the 2013 academic year, as the Faculty's ongoing drive to increase research productivity across the disciplines paid dividends.

We produced nine Doctoral graduates in 2013, and in comparison with 2012 numbers, there was a significant increase in both Doctoral and Masters registrations, especially in the School of Language, Media and Communication. Numbers of Masters students in the Visual Arts departments increased, as part of a planned strategy to grow the postgraduate programme in the School of Music, Art and Design. Registrations remained consistently high in the Schools of Architecture and Politics and Government with the Masters in Public Administration (MPA) remaining the largest postgraduate programme in the Faculty.

We produced nine Doctoral graduates in 2013, and in comparison with 2012 numbers, there was a significant increase in both Doctoral and Masters registrations, especially in the School of Language, Media and Communication.

Our academics were extremely active in the pursuit of further studies in the year under review. Dr Enaleen Draai from the Department of Public Management and Leadership received her Doctorate in April, and Ms Nicola Darke from the School of Architecture obtained an MPhil in Conservation of the Built Environment from the University of Cape Town.

There were numerous research achievements, with highlights ranging from Prof Bert Oliver and Prof Peter Cunningham's keynote addresses at prestigious international conferences, to the increase in the number of research active staff. The Faculty Researcher of the Year award went to Dr Wendy Isaacs-Martin, and the emerging Researcher of the Year was Dr Enaleen Draai. Towards the end of 2013, Prof Helize Janse van Vuuren was appointed into the ranks of the distinguished professoriate, joining Faculty of Arts colleague Prof Bert Olivier who already holds the title of distinguished professor.

The Faculty Researcher of the Year award went to Dr Wendy Isaacs-Martin, and the emerging Researcher of the Year was Dr Enaleen Draai.

As befits a Faculty with a widely diverse range of social sciences and humanities disciplines at its core, there was intensive and varied engagement activity, ranging from the prestigious annual Raymond Mhlaba Memorial Lecture, presented in 2013 by the Minister of Public Administration, Lindiwe Sisulu, to the groundbreaking work being done by Drs Zoliswa Made and Linda Kwatsha, in their promotion of the isiXhosa language through their *Ntinga Journals* project.

The growing synergies that are being forged as a result of the engagement between the humanities and the sciences were evident at the 20 May 2013 Colloquium - *A Dialogue between the Human and Natural Sciences on a Sustainable Future* - with its keynote address by Prof Benda Hofmeyr from the University of Pretoria on "Sustainability and Challenges faced by Science in the Era of Neo-liberal Governmentality". In July, there was a co-hosted "Art meets Science meets Place" field trip on which Visual Art and Science postgraduate students and academics shared cultural experience and research agendas with visiting inter-national academics and their students.

Creative Arts engagement activities linked the University to the wider community in diverse and positive ways. The Music Department hosted a variety of concerts and performances and during the course of the year; their Jazz Unit was formally established. Mr John Edwards from the department was the recipient of the 2013 NMMU Award for Creative Outputs, an honor shared by Ms Andrieta Wentzel from Visual Arts. Visual Arts academics were awarded significant creative commissions and the Visual Arts Departments maintained a high profile at both local and national level, participating in the National Arts Festival and expanding their ongoing and positive engagement partnership with the Mandela Bay Development Agency.

Ms Mary Duker
Acting Dean: Faculty of Arts

Faculty Researcher of the Year



Dr Wendy Isaacs-Martin

Dr Wendy Isaacs-Martin was a programme leader of the Master's in South African Politics and Political Economy and a Senior Lecturer in Political Studies at the NMMU since 2008. Her research focused on Identities particularly religious, gendered, ethnic and national as well as the mechanics of scapegoating. She has published in accredited journals and presented papers at national and international conferences. In 2013, she led a project on Racial and Ethnic Identities in South Africa.

Faculty Emerging Researcher of the Year



Dr Enaleen Draai

Dr Enaleen Draai obtained her PhD in Public Administration in 2013 and was recognised as the emerging researcher for the Faculty of Arts during this year. Her research focus is client satisfaction with service quality. Her work has consequently focused on divergent related areas, which include, organisational trust, professionalism in the public service as well as organisational reputation management and co-production of service quality norms and standards. Her research interest lies in aspects of policy implementation and evaluation as it relates to enabling a client-centred approach to service delivery.

Her work on service quality is related to national policy prescripts and outcomes that focus on ensuring a client-centred focus on measuring, defining and redefining the level of, and applicability of, norms and standards that pre-defines the client experience in a service encounter periodically. Her work is aligned to developments in the discipline of Public Administration and Management in the international and developmental context.

Her PhD study focussed on measuring client satisfaction with service delivery for vulnerable clients who are social assistance beneficiaries in selected rural and urban centres in the Eastern Cape. The findings indicated that clients were generally satisfied with the level of service quality received. The study makes a number of recommendations for the improvement of service quality. These recommendations include revision of norms of set for service quality as well as training in functional areas to improve level of professionalism with which service quality is met.

Dr Draai published in the area of service quality during her PhD study as well as related findings with her supervisor and co-supervisor; Profs T Mayekiso and JD Taylor. She disseminated her research findings during 2013 by

presenting papers at two international conferences. She presented a paper at the Joint Congress of IIAS-IASIA, 1-6 June 2013: Manama, Bahrain titled "Futures of Public Administration: Professionalism and Leadership Paper: Professionalism in meeting social assistance: An analysis of interventions of quality" at The South African Social Security Agency. Secondly, she presented a paper at Lien Foundation 15-17 November 2013, Singapore titled: "Client Satisfaction: An empirical assessment of quality interventions for the provision of social assistance in South Africa".

Dr Draai plans on continued publication in her area of speciality as well as working on Doctoral work with both Doctoral and Masters candidates in related areas.

Media Studies



Dr Adelina Mbinjama-Gamatham

The main area of her research is Media Studies. After completing a BA degree in Media, Communication and Culture, Dr Mbinjama-Gamatham went on to study for a Master's degree, which was followed by a treatise titled: "Investigation of social media among teenagers in King William's Town". Her interest is mainly Social Media and Cyber Ethics. As she moved into the area of cyber ethics, there was a need for enhanced, deepened theoretical grounding, in order to be able to formulate a stronger problem statement in the area of cyber ethics. She made use of the works of Jürgen Habermas.

Doctoral research has its own demands, and one must approach such studies with thorough preparation. This therefore requires a thorough review of the literature. A thorough review of the literature is key, and is at the heart of the approach one will take in the Doctoral study. Her study resulted in her formulating cyber ethical guidelines for social media users. A lot of social media users are not always conscious of what they express through their usage of social media, and the sequel of what that could be.

The challenges of her studies forced her to focus. However, most importantly it taught her how to separate time at work, and time for studies and research. A creative and healthy balance need to be kept between the two.

Striving for Excellence and Ubuntu were the main values, which informed how she conducted her research. However, going forward, she envisaged collaborating with IT Specialists, Digital Forensics, Lawyers, Law Enforcement agents, and other Social Scientists.

The other key challenge for her is how the private sector adapts to social media usage.

Her tips for future researchers are: read widely in your field; pinpoint exactly how your study will contribute to knowledge in your discipline; not rushing into the study, until you have done a thorough review of the literature; and manage your time effectively.

Local Government



Dr Nompandolo Mfene

Dr Mfene's main area of research is Local Government. She is interested in the leadership and accountability as displayed by Ward Councillors in local government. Working with focus groups, she found that some of the ward councillors are lacking in self-management. It is therefore essential to capacitate them and provide them with training on EQ (emotional intelligence).

Anomalies were found on how ward councillors conduct their affairs e.g. convening meetings and not pitching up; arriving late for meetings, at times with no agenda. However, there are wards that are well managed and well run, in as much as there are those that are poorly run.

The perceptions and expectations of communities do not always dovetail with those of the municipality. Effective communication therefore becomes essential in ensuring that conflict is reduced, or totally eradicated.

Support from the Department of Research Capacity Development proved vital, as well as the teaching replacement grants that she received. She managed to take time off to hone her skills on research methodology, academic writing, and how to publish. She found attendance of the University's research writing retreat very important.

The academic workload proved the most exacting challenge. Having a substantial teaching load, almost militated against undertaking research. There is a need to balance research, teaching and writing for publications.

NMMU values that influenced her

Striving for Excellence, Ubuntu and Integrity informed her approach to research, and working with her research subjects – in this case the ward councillors, the communities, and the municipalities.

Her work was largely an individual effort, working with her promoter. Currently, she is exploring finding collaborators nationally and internationally. This will become feasible, as she attends conferences, networks with other scholars working in the same area, and as she publishes.

Dr Mfene's tips for aspirant researchers are to: identify a field of study you are passionate about; read extensively about what you want to study – your review of the literature must be thorough; in local government, it is also important to read the Constitution, and checking whether what is happening on the ground is aligned to the Constitutional requirements; do not conduct research for its own sake. Make it a point that the research you are undertaking is solving a real problem; and be thoroughly grounded in a theoretical framework, which will cast a light on what you are researching.

Units from Journal Articles

Name of Department	Units
Applied Language Studies	1
Journalism, Media Studies and Philosophy	10.5
Language and Literature	8
Sociology and Anthropology	2.163
Public Management and Leadership	8.333
Political and Conflict Studies	3.33
Applied Design	1
Music	2
TOTAL	36.326

A close-up photograph of a financial chart, likely a stock price chart. A red line graph is plotted on a grid. A pen is pointing to a specific data point on the line. The chart shows a general upward trend with some fluctuations. The y-axis is labeled with values like 1160, 1162, 1164, 4710, 4720, 4730, and 4740. The x-axis is labeled with dates like Nov 5, Nov 8, and Nov 12. The chart is printed on a light blue background.



■ School of Accounting

DEPARTMENTS

Department of Applied Accounting
Department of Auditing and Taxation
Department of Financial Accounting
Department of Management Accounting

■ School of Industrial Psychology and Human Resources

DEPARTMENTS

Department of Human Resources Management
Department of Industrial and Organisational Psychology

■ School of Management Sciences

DEPARTMENTS

Department of Business Management
Department of Management and Entrepreneurship
Department of Logistics Management
Department of Marketing Management

■ School of Economics, Development and Tourism

DEPARTMENTS

Department of Economics
Department of Development Studies
Department of Tourism

■ Business School

| Dean's Overview



Prof Niekie Dorfling
*Executive Dean: Faculty of
 Business and Economic Sciences*

The Faculty of Business and Economic Sciences has a well-established strategic planning process, which serves to guide its research initiatives. The longer-term plan of the Faculty is built around three primary focus areas, namely: building research capacity, embedding the Faculty research themes, and facilitating transformation within the domain of research. The Faculty made excellent progress converting its plans into action and results during 2013.

A range of initiatives and interventions were introduced by the Faculty in support of expanding and building its research capacity. These initiatives included: capacitating the research office; building research expertise through training initiatives and facilitating access to specialised statistical support services; facilitating the building of research teams; appointing research associates and research fellows; and providing research entities with seed funding as well as refining the workload system and its implementation.

A range of initiatives and interventions were introduced by the Faculty in support of expanding and building its research capacity.

The Faculty identified the recognition of research involvement and achievements as a mechanism to build research capacity. While it believes that the desire and drive to do research is foremost a function of intrinsic motivation, the Faculty deliberately worked on initiatives to recognise involvement and achievements in research. Through these initiatives it added an additional layer of reward, aimed at building further interest in research as an academic activity. The suite of recognitions included: providing comprehensive incentive packages for researchers; expanding the range of research awards through the provision of a new category, namely Integrative Researcher of the Year, that recognises inter- and intra-disciplinary research; and profiling research achievements at different forums and using different mediums.

In an attempt to further enhance capacity building the Faculty embarked on a research-focused, “grow-your-own-timber” initiative, which was supported, by among others, a mentoring programme for young and novice researchers under the guidance and mentorship of senior and established researchers. This initiative also recognised the potential of PhD graduates to add capacity. A programme was thus put in place to assist them with converting their research into publications and conference papers.

The Faculty views the embedding of its identified research themes as an important strategy to facilitate a more effective use of its limited research resource base. The sharper focus provided by its research themes, namely: Local Economic Development and Ethics, Governance and African Leadership, hold the potential benefits of not only generating synergies when different researchers work around the same theme, but also of supporting the development of centres of excellence. Initiatives to strengthen the research themes include financial incentives for theme-related research, guiding qualification-directed student research towards the themes and initiating an in-house Faculty journal to stimulate and accommodate publication of research.

The Faculty views the embedding of its identified research themes as an important strategy to facilitate a more effective use of its limited research resource base.

The Faculty was successful in taking its research theme of Local Economic Development to another level. NMMU declared this theme, officially named Sustainable Local Economic Development, to be an institutional research theme and assigned the responsibility to drive the theme to the Faculty of Business and Economic Sciences. It is anticipated that this declaration will not only provide an expanded platform, but will also stimulate more inter-, intra- and multi-disciplinary research with regard to this theme.

The Faculty is committed to transformation as embodied in NMMU's Vision 2020 Strategic Plan and this commitment is also reflected in the research endeavours of the Faculty. A number of initiatives were introduced to support emerging researchers in general and specifically black and female researchers, including mentoring, development interventions, and seed funding to attend local and international conferences. In this regard the Faculty's "grow-your-own-timber" initiatives are also coming to fruition and we are impressed with the early-phase achievements of our young colleagues.

The results we are seeing reinforce our confidence that we are on the right track. While results may vary in the short-term, the longer-term trajectory, across a wide range of input, process and output dimensions, reflect a strong positive growth. This unfolding growth trajectory has been made possible through the commitment, hard work and excellence of my colleagues.

I am extremely proud of the research achievements of the Faculty during the past year and excited about the multiple research opportunities created as well as our growing capacity to support continued and accelerated growth.

Prof Niekie Dorfling

Executive Dean: Faculty of Business and Economic Sciences

Faculty Researcher of the Year



Prof Shelley Farrington

Prof Shelley Farrington's research interest and focus lie in two areas, namely: investigating various entrepreneurial issues and challenges within the context of family businesses. Her long-term research vision is to combine the fields of entrepreneurship and family business, the focus being on aspects such as transgenerational entrepreneurship and measures of success, as well as entrepreneurial orientation and entrepreneurial intentions within the family business context.

Currently, her research focus in the area of family business is on investigating transgenerational entrepreneurship and the factors influencing this among family businesses. Investigating transgenerational entrepreneurship aims to understand how successful long-lived family firms ignite entrepreneurial thought and action across generations. The NMMU Family Business Unit is in the process of negotiating a collaborative agreement with Windesheim University of Applied Sciences, Netherlands on the global Successful Transgenerational Entrepreneurship Practices (STEP) project. The STEP project currently has more than 44 affiliates in countries all around the world. Participation in this project opens up doors for several international collaborations. Future research plans revolve around this project, investigating entrepreneurial orientation and the resource-based view within the context of family businesses, amongst others. Two Masters and one Doctoral student are already working on projects within the context of the STEP project.

Prof Farrington has a keen interest in mentoring young and inexperienced researchers, her philosophy being to "hold their hand through the entire research process, from topic to output". To date she has successfully assisted six colleagues in delivering three accredited outputs and she is currently mentoring four colleagues within the Faculty of Business and Economic Sciences.

Faculty Emerging Researcher of the Year



Dr Janine Krüger

The focus of Dr Janine Krüger's research is on valuation of businesses. The value of a business is influenced, inter alia, by customer satisfaction and retention as well employee satisfaction, retention and commitment. Therefore the projects she is involved with mainly focus on how these variables influence the performance of businesses, which ultimately influence the business valuation. Her Doctoral studies focused on the valuation of Internet-based businesses over an eight-year period using various valuation methods. The businesses investigated used various online retail strategies from providing information only to customers to online trading only. She presented numerous papers on her studies at national and international conferences and one of the papers was published as a chapter in an international book. She also co-authored journal articles with colleagues within the Department of Business Management as well as with a colleague at another tertiary institution.

Her future research plans include investigating various aspects within the financial planning industry as this is a fairly new industry. Due to the changing laws within this industry, many research opportunities are identified to be investigated. Currently, she is supervising/co-supervising two Doctoral and three Masters candidates working on research projects within the financial planning industry. The other research supervision of Doctoral and Masters candidates includes cash management of informal businesses, foreign direct investments at IDZs and medical schemes implementation.

It is important to Dr Krüger to share what she has learnt through her own experience with her colleagues. She is also a keen learner and therefore she enjoys co-supervision with her colleagues. The experience and insights she gained by co-supervision and co-authoring are invaluable as it broadens the research horizon. These experiences and insights she also shares with her postgraduate students to enrich their research experiences and to foster a passion for research.

Sustainable Development



Prof Janet Cherry

Prof Cherry's main area of research is Sustainable Development. Working at grass-roots level in informal settlements – with shack dwellers, and Amabutho for example - to empower the people to live in sustainable ways. The case in point is an informal settlement in Seaview, where Participatory Action Research (PAR) was used, together with ABCD (Asset Based Community Development), and PRA (Participatory Rural Approach).

The foregoing are basic tools used to help disadvantaged communities figure out for themselves how to resolve the challenges that they face. The people themselves are involved in figuring out what course of action to take, after doing asset mapping and resource mapping. It is thus a self-reliant model.

An SSPP (Sustainable Settlements Pilot Project) was cited as an example. Prof Cherry worked with teams in the community on an SSPP (Sustainable Settlements Pilot Project), who came with a plan to do a pilot construction. An integrated and self-reliant model was used to figure out how this pilot project would really be self-sustaining in terms of the following:

- Housing energy
- Sanitation
- Clean water provision
- Income generation
- Food supply

For example, people could figure out on their own, that sand is a resource, and alien trees could be used, and cut up to form door frames. The first phase of this project has been completed. Innovative and out of the box creative thinking is sought in this realm. Sustainability is at the centre of things. It is about survival within the context of climate change, and using natural resources in a sustainable manner – solar energy for lighting, wind turbines to allow for better ventilation, and Methane from human waste used as an energy source. This is about maximizing local resources to meet local needs.

The real challenge is breaking out of the academic convention, and doing action research that is underpinned by a grassroots approach. Students are not equipped to do this kind of research. It is really about working with members of the community and letting them find the solutions to the challenges that they face.

The launch of the book, *The solidarity Economy alternative*, is indicative that people can solve their most complex challenges. People produce and provide solutions themselves.

The Mondragon, in Spain – a success story of co-operative economies - is one of the examples that illustrates that people can find sustainable solutions to their challenges.

Advice for researchers in this area of work

- You have to be persistent; you also have to be patient.
- Championing human settlement research is not easy – for a variety of reasons.

Sustainability in the Private Sector and Higher Education



Mr Riyaadh Lillah

The main focus of Mr Lillah's research is sustainability in the private sector and Higher Education. He approaches sustainability from an environmental perspective. Believing that... "If we take care of the planet, the planet will take care of us...and allow us to grow economically in the future".

His belief is that it is not enough to know about sustainability, but to apply that knowledge and skills, and have the right attitude and the right values to want to make a difference. Not just talking the talk, but walking the walk as well. It is key to realise that research does not need to be stagnant, but must be alive, and implemented (applying its findings, and not allowing the thesis... "to gather dust".

Sustainability has three components to it: Economic, Social and Environmental. Integration of all these three is therefore important. Both Higher Education and industry often neglect to see this interrelatedness. It is crucial to see the links.

This need to see the link therefore requires leadership that is visionary and having a long-term view of sustainability; but also has a sense of ethics.

The Department of Business Management, there are an abundance of mentors and a collegial spirit of mentoring. There is a large cohort of young academics, who are all enthusiastic about research, and are ready to bounce ideas of one another. They have infused a sense of healthy competition among one another. The Department prides itself on... "growing their own timbre" and they have the "best research culture".

It is imperative to put in the hours, and work consistently, and not in stops and starts. You need to work smarter, but most crucially, put in the hours. Managing time and balancing responsibilities among teaching, research and engagement.

There is a great spirit of working together, and collaboration takes place within the Department.

Mr Lillah's tips to aspirant researchers are:

- know what you are passionate about. There are ups and downs in the research process;
- therefore if you research a topic that you love, you can withstand the vagaries of the research path;
- you should be driven by your passion to make a difference. Work on your research on a consistent, even daily basis;
- find mentors, but also surround yourself with other good researchers.

Units from Journal Articles

Name of Department	Units
Applied Accounting	2
Business Management	6.841
Management Practice	0.5
Marketing Management	1.998
Tourism	1
Human Resources Management	1
Industrial and Organizational Psychology	6.167
Economics	4.5
Development Studies	1.5
Graduate School of Business	2.175
TOTAL	27.681

NMMU Family Business Unit

The Unit's first goal for 2013 was for the NMMU FBU to become part of the International STEP project. Established in 2005, STEP is a collaborative research initiative that aims to understand how successful long-lived family firms ignite entrepreneurial thought and action across generations. We achieved this goal in the following manner: The NMMU Family Business Unit, under the leadership of Prof Elmarie Venter and Prof Shelley Farrington, conducted the first interviews and case study with the family members of the well-known Tavcor Motor Group. The family manage the Volkswagen, Audi and Suzuki Dealership Group, which operate mainly in Port Elizabeth and George. Two Masters projects have been generated from this case study and are currently in progress.

Its second goal was to bring Prof Pramodita Sharma to South Africa. Professor Sharma is the Sanders Professor of Entrepreneurship and Family Business, University of Vermont, and the Global Director of the STEP project, Babson College, as well as the Editor-in-Chief, *Family Business Review*. Prof Pramodita Sharma visited NMMU during the week of 9-14 September as a guest of the NMMU Family Business Unit, housed in the School of Management Sciences. She was the keynote speaker at two gala events titled: "The art and craft of publishing in International A-listed Journals" and "Entrepreneurial Family Firms: Growing the family business across generations" respectively. She also liaised extensively with the NMMU FBU and the Department of Business and School of Management Sciences.

Its third goal was to have a family business research meeting during the Annual SAIMS Conference that was held at the North-West University from 15-17 September 2013. Joint research and possible alliances with other South African universities were initiated at the conference.

Its fourth goal was to meet with their affiliate member and partner university in the STEP project, namely the Windesheim University of Applied Sciences. Prof Elmarie Venter, Director of the NMMU Family Business Unit, visited the Netherlands from 9-12 October. She attended a seminar on family businesses. Three of the oldest family businesses in the Netherlands such as Bavaria were the guest speakers. The fathers and sons of these three businesses were speakers. Prof Venter visited the Windesheim University of Applied Sciences, where the Dutch Family Business Unit is hosted. She gave a lecture on "Entrepreneurship in South Africa with a special focus on family firms". She also visited their Entrepreneurship Hub and discussed possible exchange and the STEP collaboration with this university.

Its fifth goal was to achieve high quality research outputs. They achieved this goal by producing several international and national conference papers, accredited journal articles, Masters, MBA and Honours treatise students, a book, and several talks.

Prof Shelley Farrington (member of the FBU) was the Faculty of Business and Economic Sciences Researcher of the Year and also received a Research Excellence Award from NMMU. Two papers presented at international conferences won First and Second runner up Best Paper Awards, while one of the papers presented at a national conference were nominated for Best Paper Award.

Unit for Applied Management Sciences

The Unit for Applied Management Sciences represents the research pillar of the School of Management Sciences. The UAMS act as the consulting and research arm for the various departments comprising the School of Management Sciences (Business Management, Logistics, Marketing Management, as well as Management and Entrepreneurship). The mission of the UAMS also contributes to the achievement of the mission and strategic direction of the University and Faculty of Business and Economic Sciences. The Unit strives to develop socially and technologically competent professionals from diverse cultural and geographical backgrounds through sustaining, generating and imparting advanced knowledge by means of research, consulting, teaching and networking. The Unit strives to create an environment that encourages and supports a vibrant research culture in the School of Management Sciences and to develop mutually beneficial partnerships locally and nationally as well as internationally.

Objectives

The main objectives of the UAMS are:

- To establish, maintain and grow a creative research culture in the School of Management Sciences.
- To study and conduct research in the fields of business management, entrepreneurship and business development.
- To promote the principles of entrepreneurship at all levels of the population.
- To disseminate relevant information among particular stakeholders.
- To provide advice to stakeholders through training and consultation.

Collectively, all of the above objectives converge in economic and business development with a focus on job creation and entrepreneurship. The Unit also strives as far as possible to align some of its research activities to the institutional research theme of sustainable local economic development, which is linked to the sub-themes of entrepreneurship, SMMEs and family businesses; and local economic development and ethics and social responsibility. Many of the outputs are testimony of research conducted within these institutional research themes.

The UAMS research outputs in 2013 were: 28 international published conference papers, eight DHET accredited journal articles, eleven Masters and eleven Doctoral students, 16 BCom Honours treatises; and ten BTech treatises.

Unit for Economic Development and Tourism

The Unit for Economic Development and Tourism experienced distinct success during the period under review. It expanded the projects under its purview, showed a significant increase in terms of the various research outputs, and has attracted financially substantive projects for the near and middle terms. It is also providing the secretariat for two significant local and regional economic development ventures, namely the Eastern Cape Local Economic Development Education Forum; and the HEI Local Economic Development Consortium. It has also continued its involvement in the NMB Maritime Industry Cluster.

Given the expansion of activities on most fronts, the question of upgrading the Unit to a Centre will be accorded serious consideration during the strategic planning exercises scheduled for late 2014.

A number of its projects feature prominently in the relevant reports on the engagement and outreach activities of NMMU. **In addition to the interventions discussed above, these include the following:**

1. Training Interventions

1.1 Training intervention and filming of LED M&E DVD: Amathole District Municipality

Based on the results of a training needs analysis on behalf of municipal officials, which was conducted during 2012 for Amathole District Municipality (ADM) and in consultation with Amathole District officials, an SLP on Monitoring and Evaluation was offered to ADM officials as well as officials of ADM local municipalities. Further, a DVD has been produced, which highlights the challenges and successes of LED projects, which is to be used as a learning tool for the Amathole District Municipality and their LED officials.

1.2 Training intervention "Introduction to LED": Eastern Cape Provincial Department of Local Government and Traditional Affairs

A Local Economic Development Secretariat meeting was held in February 2013. One of the agenda items was the capacitation of the LED assistants that would be working in all the local municipal offices in every district of the Province. It was decided that the Short Learning Programme: "An Introduction to LED" should be delivered in order to ensure that these new LED officials would be an asset to their districts.

The Short Learning Programme: "An Introduction to LED" was delivered in East London between the 30th of September and the 4th of October 2013. Twenty-three LED assistants were trained and found competent on the Short Learning Programme.

1.3 MBDA: Youth and Development

The Unit was approached by the Mandela Bay Development Agency (MBDA) to conduct a training intervention for 20 Youth and Child Care Workers in the Helenvale Area. The Short Learning Programme (SLP): "Youth and the Challenges of the Developing World" was presented initially to 20 youth workers identified by the MBDA. A unique feature of the programme was that it was presented in Helenvale, which made it more accessible for the participants. Seventeen students completed the SLP. The Certificate Ceremony was conducted on Thursday, 10 October 2013.

1.4 NUMSA: Shop Stewart Training

The first stage of the NUMSA Education programme was completed during 2012. In February 2013, the Certificate Ceremony was held with national TV coverage. Continuing dialogue with NUMSA head office was undertaken for the balance of the year to negotiate the way forward with regards to continuing education for the class of 2012 and new shop stewards entering the programme. The Unit is currently negotiating the establishment and offering of a second SLP focussing on an "Introduction to Political Economy".

1.5 Blue Crane Development Agency: Social and Emerging Entrepreneurs

The Blue Crane Development Agency (BCDA), via the Cacadu District Municipality, approached the Unit during 2012 regarding a need for an urgent intervention to support the entry into and sustainability of previously disadvantaged individuals and groups in the Cradock/Somerset-East Area into the challenging world of business.

The proposed initial solution to this problem was the creation of a Small Business Development and Management Resource Centre for the purpose of assisting these individuals to become sustainable business people. The intention is to enrol these potential business persons into a capacity building enterprise programme as "Business operator apprentices". A more modest version of the above-mentioned project officially commenced in June 2013. It is funded by the Cacadu District Municipality.

Individuals are holistically assisted with the start-up of their enterprises together with assistance with the institutional requirements. They are mentored and systematically up-skilled in the finer art of small business management with the objective of them being sufficiently skilled to be independently integrated into the broader business community. The programme continues.

1.6 GM South Africa Foundation Partnership

The GM South Africa Foundation sponsored 27 students to complete the Short Learning Programme and the Challenges of the Developing World during 2013. This is the result of a partnership that was initially formed during 2011 when the SLP was first registered.

1.7 Research Implications

Provision has been made for reflection research on selected aspects of the projects mentioned above.

2. Research and Applied Research Activities

Research and applied research initiatives included the following:

2.1 Country in the Eastern Cape: Past, Present and Future Trajectories Conference

The Conference was hosted jointly by UFEDT, NMMU and Fort Hare Institute for Socio-Economic Research (FHISER) in November 2013, this Conference attracted both local and national academics.

The aim of the Conference was to showcase current and emerging research work on the restructuring of rural and urban regions in the Eastern Cape, the relationships between these regions and centres, and the development policy and planning implications of such work.

A special issue of the *Journal of Development and Leadership* is being prepared for select papers from the Conference.

2.2 Research Oriented Contract Work and Research with the CDC (Coega Development Corporation)

2.2.1. *Perspectives Journal*: Coega Development Corporation

The Fifth volume of the *Perspectives Journal* was published in partnership with, and for, the CDC in March 2014.

2.2.2. Other Projects with the CDC

Other Work for the Coega Development Corporation Research Division includes:

- Reviewing and editing the 2013 Economic Outlook for the Eastern Cape, a CDC and Department of Economic Development and Environmental Affairs production.
- Reviewing and editing a 2013 CDC and ECDC assessment of the training and skills needs for the medium-term outlook of selected sectors of the Eastern Cape's economy.
- Reviewing and editing a situation report on tourism in the Eastern Cape Tourism by Peter Myles. Coordinating the production of a spin-off research paper on the topic by Peter Myles.
- Reviewing and editing the methodology and reports in regard to the development and implementation of an Input-Output model by Dr Hermann Azemtsa. Establishing the groundwork for the provision of a future SLP on I-O modelling.

In addition, a feasibility study of an aerospace, aeronautical and defence cluster for two contiguous zones in the CIDZ for a CDC business unit commenced in late 2013 and was recently completed.

2.3 Oceans and Coasts Project: The Economy of the South African Ocean Sector

This long-term project continued into 2013 with two components:

2.3.1 The Economic Contribution of the Ocean Sector in South Africa.

Research and report completed April 2012. The report was sent for publication and we are awaiting the result.

2.3.2 Oceans and Coasts Project 2: An Assessment of the Potential of Ocean Based Renewable Energy to the South African Economy. The report was completed and submitted in August 2013.

2.4 Other Research Activities

The Unit has also continued with its in-house research project on foreign traders and is looking to secure funding for a study on export firms in selected sectors in the Eastern Cape and national economies. A paper is planned for presentation at the forthcoming South African Development Studies Association Conference, which will be hosted in Port Elizabeth in September 2014.



Guiding tomorrow



- School of Initial Teacher Education
- School for Continuing Professional Development
- School for Education Research and Engagement

Dean's Overview



Prof Denise Zinn
Executive Dean:
Faculty of Education

The Vision of the Faculty of Education is “to be a dynamic community of teachers, leaders and scholars in education, committed to creating a vibrant, socially just and democratic society”. This vision has informed our research and engagement themes and foci, which have also been integrated into our teaching and learning efforts, especially renewal of our curricula.

For our “community of scholars”, 2013 was a year with a strong focus on research integrating engagement as well as teaching and learning.

For our “community of scholars”, 2013 was a year with a strong focus on research integrating engagement as well as teaching and learning. The Faculty’s Research Chair in HIV&AIDS continues to flourish, as do the four research and engagement entities, focussing on Science, Mathematics and Technology Education (SMATE); Visual Participatory Methodologies; Action Research; and Intercultural Education. Overall, the Faculty had a really good year in terms of research outputs and publications, with 27 articles published in accredited journals, six book chapters, and three staff members as co-editors/authors of new books published in 2013.

Highlights include the ongoing joint research funded by the NRF Sweden-South Africa Links Scientific Literacy Project, with South Africa-Sweden exchanges between Gothenburg and Uppsala University resulting in an article published on writing in science classrooms and one on disciplinary literacy at tertiary level (introductory physics) submitted. The findings were presented at a conference in Cape Town in January and the data from the physics disciplinary project were disseminated at the five participating universities in the Eastern and Western Cape. Research findings in technology education (IT) were presented at an International Scientific Conference in Siauliai, Lithuania and at the Fourth Annual ICT in Higher Education Conference in Johannesburg.

Three academics in the Faculty of Education were actively involved and comprised the core membership of the Action Research Unit in 2013. A total of four papers were presented at international conferences, and several postgraduate students completed studies using action research methodologies. Collaboration with two renowned scholars in action research, Profs McNiff and Zuber-Skerritt, continued in 2013, and their methodological frameworks form the basis of many current research projects.

The Unit for Visual Methodologies for Social Change was established towards the end of 2010 by the HIV & AIDS Education Research Chair, its mission being to advance the study of visual and participatory methodologies in education settings. Drawing on innovative research methodologies is key in the South African context, and particularly in the context of the HIV epidemic and gender-based violence, shifting the boundaries of what counts as research and how it is disseminated. The work of the Unit is clearly located in a critical paradigm and as such has the potential to contribute to social change, providing a firm base for extending the use of innovative research methodologies to more researchers and also to other disciplines and contexts. A highlight in 2013 was the piloting of the work in the “Girls leading “from the ground up” “in policy-making in addressing sexual violence at a South African university”, project. This pilot study informed the application for a larger collaborative project with Claudia Mitchell (McGill University, Canada) and Relebohile Moletsane (University of KwaZulu-Natal) Networks for change and well-being: Girl-led “from the ground up” policy-making in addressing sexual violence in Canada and South Africa (SSHRC/IDRC: 2014-2019), which was successful in securing handsome funding. Based on this research, a series of dialogues with key policy makers in the University is planned for 2014.

A highlight in 2013 was the piloting of the work in the Girls leading “from the ground up” in policy-making in addressing sexual violence at a South African university, project.

The Intercultural Education Unit (ICEDU) focuses on conducting research and disseminating its findings through conference presentations and publishing in its focus area of intercultural education. A special issue of the journal, *Education Research for Social Change on Interculturalism* was published in 2013, with Prof Nonnie Botha and Dr Lyn Webb as guest editors, attracting national and international authors. Collaborative research was conducted by Dr Lyn Webb with Eva Lambertsson Bjork and Jutta Essenbach from Ostfold University, Norway, on generating intercultural conversations through a novel approach, called REEL Life. It involves using film clips on common topics to increase intercultural communication. The South African leg of the research will be presented on at an international conference in Tucson, Arizona in 2014.

The Faculty’s Centre for the Community School (CCS), an engagement and research entity launched in 2011, continues to make significant strides to build the connection between schools and their communities, with strong support from the Faculty and University. The CCS adopts the view that knowledge generation is a reciprocal process, in which the University and

school-communities are deeply engaged in work as partners. Through this process, the inclusive sharing of knowledge, ideas, and critical reflections can lead to deeper understandings and the emergence of new knowledge. The relationships between the partners in this process should therefore be informed by the core values of respect, trust, sensitivity to school and community dynamics, and openness to learning. The CCS has supported the development of an independent network of community schools, called the Manyano Network. The Network comprises 11 primary and three high schools that are located in the communities of Port Elizabeth and Uitenhage. The central focus is on instruction, and other aspects of school improvement are built around this. One of the goals for the year was to develop a research agenda for the CCS. Members of the Network have become engaged in a Scholars Writing Circle, with one principal completing a Master’s degree in 2013. He is now registered for Doctoral studies on aspects of the work of a community school. The CCS also presented its work at two conferences in 2013.

The Faculty’s Centre for the Community School (CCS), an engagement and research entity launched in 2011, continues to make significant strides to build the connection between schools and their communities, with strong support from the Faculty and University.

To generate and encourage ongoing interest and participation in research and inquiry in 2013 a series of research seminars were held in the Faculty on Wednesdays during the University’s lunch hour, and opened to the whole University community. The aim of the seminars was to create a space for academics to share their research and to stimulate discussion and further research. Several seminars were presented during the year on topics ranging from teacher professional development in farm schools, exploring the theory and praxis of humanising pedagogies, to exploring the use of folktales to enhance the resilience of children orphaned and rendered vulnerable by HIV and AIDS, inter alia.

The Faculty continues to consolidate and develop a range of new research initiatives, to give meaning and substance to our goal to make a “culture of inquiry” one of the golden threads running through the work of the Faculty. We look forward to the ongoing research growth, creativity and most importantly, relevant knowledge creation in years to come!

Prof Denise Zinn
Executive Dean: Faculty of Education

Faculty Researcher of the Year



Prof Naydene de Lange

Naydene de Lange is Professor and HIV and AIDS Education Research Chair in the Faculty of Education. Her research focuses on using visual participatory methodologies in addressing gender and HIV&AIDS issues, and integrating HIV&AIDS into the curriculum. Her Educational Psychology background and interest in Inclusive Education provides a frame for working towards the inclusion of those who are marginalised - using a "research as social change" approach.

Her postgraduate students also contribute to advancing knowledge in her field of research. She supervised seven Doctoral students and two Masters students, with three of the Doctoral students submitting their theses for examination. Rekha Mahadev's thesis is titled: "Exploring sexual violence among Indian youth in the age of AIDS: A participatory video approach"; Thoko Mnisi's work is titled: "Digital storytelling: Exploring HIV-related stigma with learners in two rural Kwazulu-Natal schools"; and Cheryl Kader's work is titled: "An exploration of how female adolescents in "sugar daddy" relationships construct their sexuality in the context of HIV and AIDS". Their postgraduate work also contributes to pushing the boundaries of qualitative research and extends the knowledge on visual participatory research.

A highlight of 2013 was the initiation of a collaborative project, funded through the NMMU Research Grant. Encouraged through the longstanding engagement with two colleagues (one international and one national) with whom she has worked for several years, she piloted the Digital media for change and well-being: Girl-led 'from the ground up' policy-making in addressing sexual violence at a South African university with first-year women education students. They used cellfilms to explore sexual violence, developed policy posters and action briefs, and then used these to

engage in dialogue with several high level policy makers in the University. This important work feeds into a large multi-country, multi-year, and multi-site project headed up by a South African (Prof Moletsane) and a Canadian (Prof Mitchell) colleague. Being part of this project - and with Prof De Lange heading up the Eastern Cape site - opens up further opportunities for addressing issues of sexual violence in South African and Canada through cutting-edge visual participatory research. An SSHRC/IDRC grant worth R25 000 000 (2014-2019) has been awarded to Prof de Lange.

Prof De Lange intends to continue focussing on HIV and AIDS issues and gender-based violence - two issues which require more vigorous attention in South Africa - and which she believes should be addressed from a "research as social change" approach.

Faculty Emerging Researcher of the Year



Dr Nokhanyo Mayaba

Dr Nokhanyo Nomakhwezi Mayaba, a lecturer in the Faculty of Education at Nelson Mandela Metropolitan University, has extensive experience in teaching English as a second language and methodologies of teaching English and isiXhosa. Her research interests include literacy issues in Education, language across the curriculum and the use of folktales as a means of encouraging resilience and academic skills. She has co-published articles on issues of literacy in Science classrooms and the use of folktales to encourage resilience in children who have been orphaned and rendered vulnerable by HIV and AIDS. Dr Mayaba is a strong believer in participatory research, and probes among both teachers and learners in the quest to find solutions. She is planning to work with teachers and engage them in the use and development of pedagogical strategies to access the resilience and skills enhancing value of folktales across the curriculum.

Leadership Competencies of School Principals



Dr Chris Dali

Dr Chris Dali's main research focuses on the leadership competencies of school principals, especially the relevance of EQ (Emotional Intelligence) competencies to promote collegiality, and lead effectively. He used the EQ theoretical framework to understand the leadership competencies of school principals. Other areas of research interest are: Adult Education and Social Transformation, and how critical thinking can be used for teaching purposes.

He made use of school principals who were a "captive audience". They were attending the ACE programme at NMMU, coming from places in the Eastern Cape: Port Elizabeth, Graaff-Reinet, George, Qumbu, and Kokstad.

The interpersonal, and the intrapersonal aspects of self, as well as self – confidence, committed to work, understanding own emotions and those of others, are some of the aspects coming out of understanding the role of EQ in human functioning. Leaders who are high on EQ have better relations with others, and a better understanding of their context. They are sensitive to issues that can demoralise and alienate staff – and eschew these. They have mastered the art of how to deal effectively with other humans.

Dr Dali has a captive audience from which to draw a sample. He worked in a field that he is passionate about; having a firm theoretical base was really empowering.

He also enlisted a group of "Critical friends/ Critical readers": people who could look at the blind spots in his research, and advise on how these blind spots could be removed.

The teaching load sometimes militated against finding time to do research. It was also challenging to find a balance among teaching, research and community engagement – doing justice to these, without compromising one. It was also important to understand "the politics of research": meaning knowing who is out there to assist you when you are stuck.

Dr Dali was among the team that formulated these values and believes firmly that the University should be part of the nation building project. Values were formulated against the backdrop of the transformation agenda. Ubuntu, Diversity and Excellence are some of the values that were woven into his research – especially around social justice, and humanising the pedagogy.

For values to contribute to the benefit of all – an invitation... "to the round table" understanding must hold sway – everyone around the round table, has equal and equitable opportunities to redress and access.

Units

Name of Department	Units
School for Initial Teacher Education	1.835
School for Continuing Professional Development	2
School for Education Research and Engagement	16.835
Education Management	1.16
TOTAL	21.83

Intercultural Education Unit

Entity leader: Prof MM (Nonnie) Botha



One of the roles of the Intercultural Education Unit (ICEDU) is to provide an intellectual base for Masters and Doctoral students who focus their studies on interculturalism in education. Three such students completed their studies at the end of 2013, namely:

- MEd student Phaello Malataliana, supervised by Prof Nonnie Botha, with a dissertation titled: "The link between intercultural differences and an optimal teaching and learning environment in a Maseru school";
- MEd student Saloshni Pillai, supervised by Dr Lyn Webb, with a dissertation titled: "Teachers' and learners' experiences and perceptions concerning the use of English as the language of learning and teaching in bi/multilingual mathematical literacy classrooms"; and
- PhD student Denis Sekiwu, supervised by Prof Nonnie Botha, with a thesis titled: "Integration of values into management of learners' discipline in Ugandan schools".

A new MEd student, Mr Carl Pieterse, was recruited in 2013. The title of his study is: "Promoting intercultural understanding through relevant undergraduate teaching and learning strategies" with Prof Nonnie Botha as his supervisor.

The ICEDU also focuses on conducting research and disseminating its findings through conference presentations and publishing in its focus area of intercultural education. During 2013, Dr Lyn Webb presented a paper at the African International Congress of Mathematics Educators (AFRICME) in Lesotho. Following from this conference presentation, an article was published in a peer reviewed journal, *Educational Research for Social Change*, with the title: "Teaching Strategies in Language-Diverse Mathematics Classes: A Case Study."

Two article manuscripts were submitted by Prof Nonnie Botha to journals to be considered for publication: one on a conceptualisation of intercultural education and the other on intercultural postgraduate research supervision. One book chapter was published by Dr Lyn Webb with the title: "Curricular reform for the training of mathematical literacy teachers in South Africa: Looking back to move forward" in a book with the title *Critically, Creativity and Connections: in pursuit of educational innovations*.

A special issue of the journal, *Education Research for Social Change on Interculturalism* was published in 2013, with Prof Nonnie Botha and Dr Lyn Webb as guest editors, attracting national and international authors. Some of these included Tamsin Meaney who was also invited to be plenary speaker at both the international Mathematics in Society conference in April 2013 and the Africa-wide SAARMSTE conference in January 2014. Other international authors included Casey Burkholder whose article reported on Hong Kong language practices, while the article of Sarah Des Roches reported about language practices in Canada.

Capacitating other academics in intercultural education is also one of the roles of the ICEDU and as such Prof Nonnie Botha facilitated a workshop on intercultural postgraduate research supervision as a pre-conference workshop at the international Postgraduate Supervision Conference in April 2013, in Stellenbosch.

Collaborative research was conducted by Dr Lyn Webb with Eva Lambertsson Bjork and Jutta Essenbach from Ostfold University, Norway, on generating intercultural conversations through a novel approach, REEL Life. It involves using film clips on the topic of "marriage" to increase intercultural communication. The South African leg of the research will be presented on at an international conference in Tucson, Arizona in 2014.

Science, Mathematics and Technology Education (SMATE) Unit

Leader: Prof Paul Webb



Highlights of 2013 were the ongoing joint research funded by the NRF Sweden-South Africa Links Scientific Literacy Project. South Africa-Sweden exchanges took place as planned between Gothenburg and Uppsala University resulting in an article published on writing in science classrooms and one on disciplinary literacy at tertiary level (introductory physics) submitted. The writing findings were presented at a conference in Cape Town in January and the data from the physics disciplinary project were disseminated at the five participating universities in the Eastern and Western Cape.

Research findings in technology education (IT) were presented at an International Scientific Conference in Siauliai, Lithuania. The conference paper was consequently published in an international journal. The heuristic for ICT implementation that was developed from the data was also presented at the Fourth Annual ICT in Higher Education conference in Johannesburg.

Other papers produced included publication of an article on Xhosa indigenous science, the use of indigenous knowledge in the management of forests in Kenya, and on teaching strategies in language-diverse mathematics classes. A total of six journal articles were published and seven conference papers read. One PhD student graduated with research focused on promoting scientific literacy in Pharmacy students and one MEd student on teaching and learning electrostatics using indigenous knowledge at school level.

Unit for Visual Methodologies for Social Change

Leader: Prof Naydene de Lange



A highlight in 2013 was the piloting of the work in the Girls leading “from the ground up” in policy-making in addressing sexual violence at a South African university, project. This pilot study informed the application for a larger collaborative project with Claudia Mitchell (McGill) and Relebohile Moletsane (UKZN) Networks for change and well-being: Girl-led “from the ground up” policy-making in addressing sexual violence in Canada and South Africa (SSHRC/IDRC: 2014-2019), which was successful in securing handsome funding.

On 4 - 5 October 2013, a small group of young first-year women education students, hailing from the rural areas of the Eastern Cape, came together for a research workshop with Naydene de Lange and Relebohile Moletsane. The focus of the research workshop was to explore the use of innovative approaches to programming, policy-making, and communication in reducing sexual violence amongst young women.

This was the first phase of the project where the young women students engaged in “cellphilm” making and focus group discussions, in relation to various issues that are associated with young women and sexual violence in the age of AIDS. The issues raised in the cellphilm were turned into policy posters and complementing action briefs. The workshop was insightful of the experiences and perspectives of young rural girls. It was reassuring to see how the young first-year women took charge, spoke about and considered addressing sexual violence in and around the University. One of the envisaged outcomes of the project with these young women is to inform policy change contributing to addressing sexual violence in South Africa. A series of dialogues with key policy makers in the University is planned for 2014.



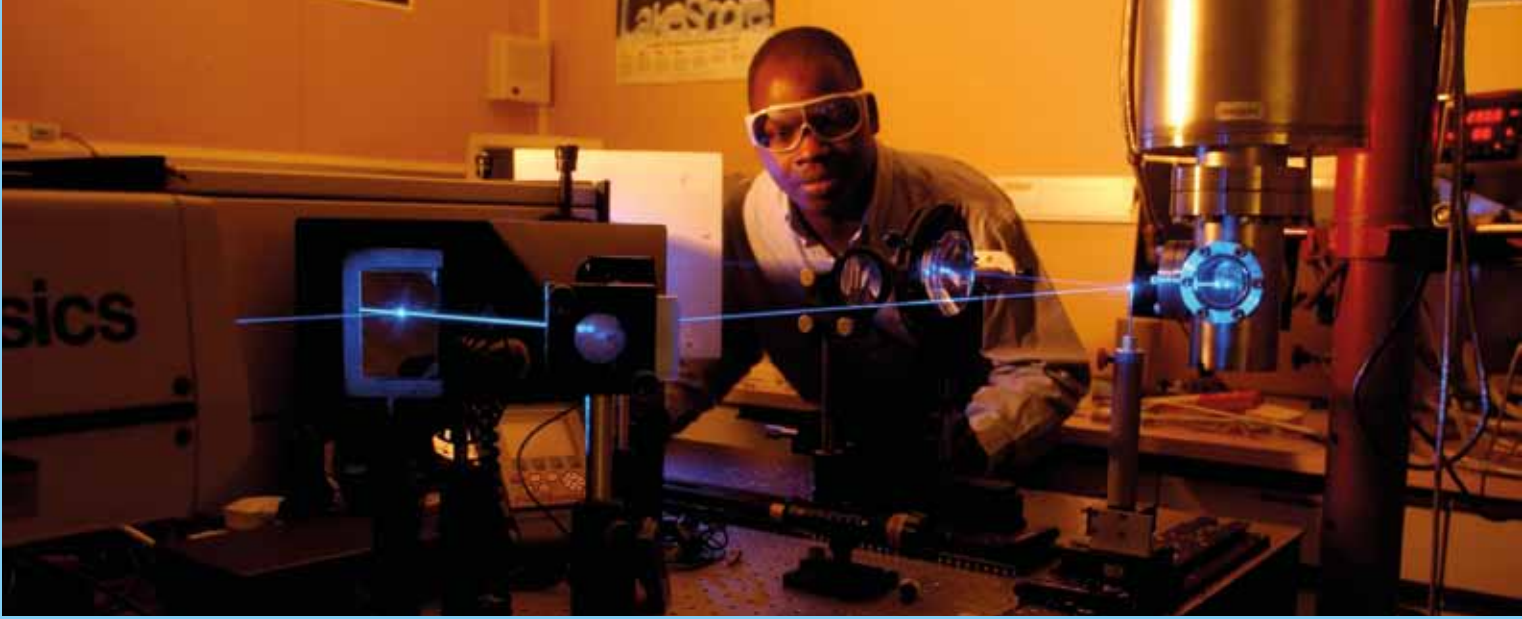
“Girls leading Change” with Prof de Lange and Prof Moletsane.



A student filming her group.

Faculty of Engineering, the Built Environment and Information Technology

Technology for tomorrow



■ School of Engineering

DEPARTMENTS

Department of Civil Engineering
Department of Electrical Engineering
Department of Industrial Engineering
Department of Mechanical Engineering
Department of Mechatronics

■ School of the Built Environment

DEPARTMENTS

Department of Construction Management
Department of Building and Quantity Surveying

■ School of Information and Communication Technology

DEPARTMENTS

Department of Applied Informatics
Department of Information Technology

| Dean's Overview



Dr O Franks
Executive Dean: Faculty of
 Engineering, the Built
 Environment and Information
 Technology

The Faculty of Engineering, Built Environment and Information Technology can look back on 2013 with a degree of satisfaction, having accomplished a lot on the research front.

The number of rated researchers increased to 14, with two staff members, Professors Dalenca Pottas and Johan van Niekerk, successfully receiving a rating from the National Research Foundation.

Staff has also been productive in publishing articles and presenting conference papers. It is anticipated that the research publication outputs for the past year will exceed those of previous years. A total number of 39 postgraduate Doctoral and Masters degrees were conferred in the year under review.

The number of rated researchers increased to 14, with two staff members Professors Dalenca Pottas and Johan van Niekerk, successfully receiving a rating from the National Research Foundation.

Furthermore, a number of staff are working towards higher qualifications. Our HEAVA professors and Research Associates continue to make a valuable contribution to our faculty research.

It is not only the staff who have been involved in highlighting their research, but also our postgraduate students.

A doctoral student, Ms Rayne Reid, in the School of Information and Communication Technology, was invited to present her research at the Kaspersky "Cyber Security for the Next Generation" Student Conference for Asia-Pacific & Middle East and Africa Round. Rayne won the award for the most practical paper in the region and she was subsequently invited to the worldwide finals in London UK.

The Faculty Top Researcher of the Year was Prof John Smallwood, Head of the Department of Construction Management. He is extensively involved with research at postgraduate level and addresses a broad spectrum of construction management research areas. Prof Smallwood's research outputs are not constrained to scientific

journals and conferences but include commissioned reports and presentations to commercial conferences. The Faculty Emerging Researcher of the Year Award went to Dr Farouk Smith. His areas of research includes Embedded Computer Systems, Hardware Evolution, and Radiation Protection of Spacecraft Electronics. His research resulted in several ISI journal and conference publications, and the latter resulted in the registration of three national and one international PCT patent applications.

The late Prof JJ van Wyk is reputed to have spent 20 years of his life developing what culminated into the Bachelor of Human Settlements Degree. He was awarded an R13 million grant by the Minister of Human Settlements to fund a Chair in Education in Human Settlements. The Chair was launched in March 2013 and the Degree will enroll its first students in 2014.

The Faculty has numerous partnerships with industry and actively participates in productive international research collaborations. The School of ICT, community engagement through the use of technology, was taken to new heights in 2013.

Under the leadership of Prof Darelle van Greunen (School of ICT), research and engagement were successfully combined into tangible initiatives using Information Community Technology as an enabler in several endeavors during 2013. The different initiatives all contribute to a holistic approach to support the citizens of South Africa, but to also reach the Millennium Development Goals.

Motherwell, the third largest township in South Africa, benefited from one such initiative as approximately 100 persons from the community successfully completed an e-Skills short learning programme. The programme was presented by staff and students from the School of ICT and afforded residents the opportunity to not only learn more about the use of technology but to also access information using technology and then more specifically the Internet and email clients.

Primary healthcare service delivery with the assistance of community care workers also benefited from the introduction of technology. During 2013, two pilot demonstrations were executed in Motherwell and Gelvandale. These demonstrations enabled the use of mobile technology to capture patient data in real-time. The use of technology enabled better management of primary healthcare but also contributed to improved monitoring of patients.

The Tech4Red e-health initiative in Cofimvaba aims to demonstrate the use of eHealth to improve school healthcare. The primary objective of this project is to make use of mobile devices with specific mobile applications to improve access to school healthcare and health education based on the needs of the schools in the Nciba Circuit. As a first step, digital storytelling transmitted on large television sets added to the creation of awareness and educating members of the community, teachers and learners on specific health-related topics. The installation of the television sets containing the digital materials also aided the

staff in educating the population as they can watch the materials whilst waiting to see clinical staff. As a result, the number of visits to various clinics improved.

The Youth Leadership Academy under the auspices of the Memorandum of Understanding between NMMU and FamHealth graduated 15 learners from different schools in the Northern Areas. These Grade 11 learners successfully completed the programme that includes a range of topics but ultimately leading to character building of new leaders for the future. Not only is the change visible in the young leaders during the completion of the course, but also feedback from the community at large indicates that they detect a change in attitude and approach amongst the future young leaders.

Based on all the different initiatives during 2013, it is clear that the use of technology can be a catalyst for change in different communities.

Research within the Advanced Manufacturing and Engineering theme is aligned with the strategic goals of Vision 2020 for the NMMU. This is achieved by promoting collaboration and sharing of resources between multiple departments on an inter-faculty basis. This approach allows for innovative solutions in the field of engineering, manufacturing and technology development, supporting human resources development, knowledge generation/transfer and commercialisation. Advanced Manufacturing and Engineering theme supports: Automotive Engineering, Assembly Processes, Friction Processing as an joining and repair technique, Production Optimisation (Lean Manufacturing), Renewable Energy (wind and ocean) exploring off-grid applications and technologies, Supplier Development for the broader engineering and manufacturing industries (support export readiness, job creation), and High Precision Fabrication for medical applications. During 2013 the theme has published a number of journal articles and conference papers to both local and international audiences. Postgraduate research projects concluded in 2013 ensured that 12 Masters and three PhD candidates graduated. Engineering and advanced manufacturing underpins much of South Africa's economy and holds great potential for job creation and social upliftment. Through this theme South Africa's advance manufacturing industry has access to world-class research facilities aligned with creating a sustainable engineering environment that encourages skills development and nurturing a culture of engineering innovation.

The GMSA Chair has a number of R&D projects at GMSA, of which, the development of an Automated Guided Vehicle (AGV) is the most advanced in terms of commercialisation. The AGV project is also supported by the Technology Innovation Agency (TIA). The GMSA Chair has a number of on-going research projects in fields of robotics and machine tool modelling with Aachen and Reutlingen Universities in Germany, the Automation Institute in Milan, the University of Luxembourg and Hong Kong University of Science and Technology. The Chair also signed a five-year agreement with the Energy Efficiency Specialisation Centre at UCT to conduct collaborative work on a major research project for Eskom to deliver sustainable improvements

in power generation by modelling the control of coal-fired power generation plant processes and systems.

The staff members of the Department of Mechatronics are working on a number of research areas related to Mechatronics. Prof Theo van Niekerk has established a research group within the field of mechatronics and automation and has developed a research facility and capacity (hardware and software). Through his involvement with Siemens, VWSA-DAAD Chair and Ostfalia University, Prof van Niekerk has developed research infrastructure to support a large team of postgraduate research at NMMU. His team is working on issues such as wireless mobile technology applied for automation system monitoring, sensor based monitoring and integrated control systems, industrial implementation of artificial neural network and other intelligent systems, and autonomous guided vehicle applied within factory automation.

Prof U Becker currently acts as DAAD Chair in Automotive Engineering. As the activities in 2013, in collaboration with the DAAD, accelerated the student exchange and result in internationally-accredited researchers and engineers, it has been decided to apply for a renewal of the DAAD Chair contract.

Current Projects

The shared research supported by Prof T van Niekerk and Prof U Becker covers the following currently running projects:

- Roller Test Bench ("Rüttelrolle") for simulation of road surface excitation (in collaboration with VWSA);
- Low Cost Automation for Manual Press Line;
- Low Cost Automation via "Autonomous Guided Vehicle" for Logistics (in collaboration with VWSA); and
- Formula Student: Integration of a Drexler Differential and a Redesigned Gearbox for Formula Student Applications into the Housing of the BMW K71 Research Engine.

Former and current projects are a cut surface between students finishing their degrees and their activity as engineers in the industry. For example, Dipl.-Ing.(FH) Marc Hochheuser, who achieved the Award of "Best MEng Mechatronics Student 2012", is employed by IAV Gifhorn, a 100% daughter of VW. Henk Potgieter is now employed as "Component Trim Engineer" at VWSA due to his contribution with his BEng Final Year project for VWSA: "Dual Axis Solar Tracking Turntable".

The Joint Research Project "Full Variable Valve Train" is a contribution to more efficient vehicle powertrains in the field of automotive engineering and it covers and combines the fields of mechanical, electrical and software engineering. The project is sponsored and supported by the German BMBF (Federal Ministry of Education and Research) with a cover of around R3.8 million. Some of the partners involved in the collaboration as such are:

- Ostfalia University of Applied Sciences in Wolfsburg, Germany
- Nelson Mandela Metropolitan University
- Volkswagen
- BMBF (see above)

The collaboration enables an international exchange, allowing degree

seeking students, to achieve their university degrees at NMMU as an international university.

Students and research are supported by Prof U Becker from the German Ostfalia University and Prof T van Niekerk from the NMMU.

The Department is also known for some research and patent outputs in the area of radiation protection. The group established by Dr F Smith has a focus on developing designs and procedure to protect spacecraft electronics from radiation. They are also engaged in research dealing with embedded systems designs and hardware evolution.

The Department hosts a state-of-the-art facility that has been developed by Prof Abou-El-Hossein. This facility was sponsored jointly by the NRF and NMMU through the National Equipment Programme. The R13-million facility is the only one of its kind on the continent and it is capable of realising ultra-high precision manufacturing processes for the development of advanced and complicated optical components for the aerospace and defense industries. The precision engineering team runs projects that include the application of advanced materials such as infrared materials and single-crystal diamond cutting tools to shape advanced optics. The team is also busy with a project sponsored by the Medical Research Council and Technology Innovation Agency to develop and prototype contact lenses suitable for certain ethnic groups.

The renewable energy research group (RERG) is proud to announce that the Twerly hybrid green streetlight developed by the group in conjunction with eNtsa has been selected as a semi-finalist in the Global Cleantech Innovation Programme.

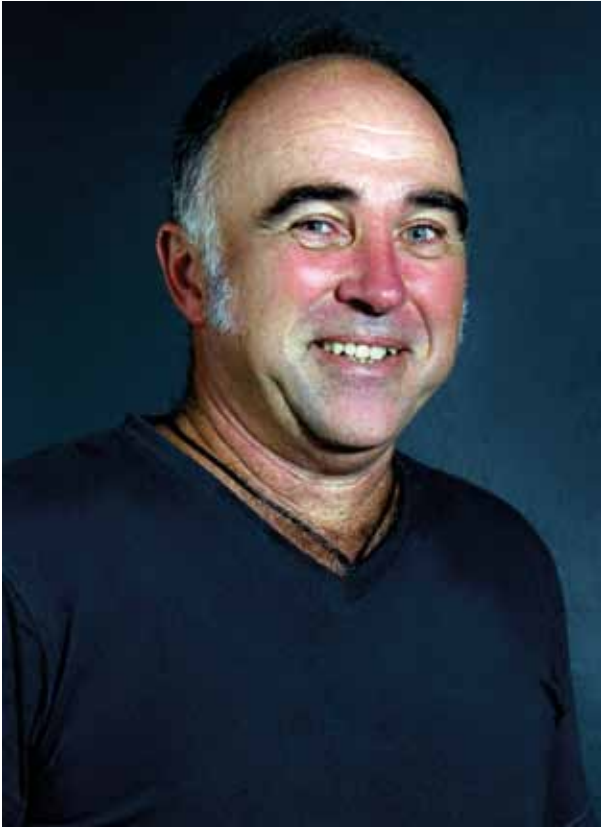
Research activity continued to grow from strength to strength in the School of the Built Environment in 2013. The School's contribution to the Faculty and University in terms of journal and conference paper publications grew substantially in the year under review. The School also graduated 12 Masters and four PhD candidates. A notable move within the School was the introduction of a very successful series of Friday lunch hour colloquiums at which both staff and students present topical issues, thus keeping the concept of a vibrant "community of scholars" alive. The number of new registrations for both Masters and PhD also grew quite substantially in the year under review. The School, therefore, expects that the number of postgraduate candidates graduating annually for the next two or three years will be comparable to the 2013 levels.

I am extremely proud of the research achievements of the Faculty during the past year. All staff needs to be acknowledged for their dedication, hard work and commitment towards achieving their research successes and taking the Faculty forward. We will continue to strive for research excellence and are confident that 2014 will build on the success of 2013. The Faculty also extends its appreciation to top management at the NMMU Research Department for their support and leadership.

Dr O Franks

Executive Dean: Faculty of Engineering, the Built Environment and Information Technology

Faculty Researcher of the Year



Prof John Smallwood

Professor Smallwood is a Professor in Construction Management. He addresses a broad spectrum of Construction Management research areas, but specialises in health and safety, and ergonomics. He is involved with research at Honours, Masters and Doctoral level, and undertakes academic, contract, and organisation specific research. Outputs are not constrained to scientific journals and conferences, but include reports to organisations and employer associations, and presentations to commercial conferences.

The year 2013 was a particularly successful year as he concluded the promotion of three PhD (Construction Management) studies and co-promoted a further one. Two papers co-authored with a Doctoral graduate were published in the United Kingdom's *Institution of Civil Engineers (ICE) – Management, Procurement and Law Journal*. Further papers published in DHET accredited journals include a paper emanating from an Honours research study: "Quality of low income houses in South Africa". Conferences attended include, among other, the CIB W99 (Safety and Health in Construction) Conference in Singapore, where he delivered five papers, three of which were co-authored with PhD candidates. Prof Smallwood is also the Coordinator: Africa and Middle East of CIB W99.

UNITS

Name of Department	Units
Industrial Engineering	0.5
Mechanical Engineering	3.374
Mechatronics	6.5
Construction Management	3.175
Quantity Surveying	1
Building and Human Settlement Development	0.335
Information Technology	9.087
Applied Informatics	2.083
Engineering Management	0.666
TOTAL	26.72

Unit for Lean Process Development

Leader: Dr K van der Merwe

The Unit for Lean Process Development (ULPD) is actively engaged in research and scholarly and community service activities to advance education and skills improvement to enhance the competitive advantage of the South African business and academic community through the implementation of the lean process philosophy. Highlights for the year include the following achievements and developments.

A paper was presented at the South African Industrial Engineering Conference held in Stellenbosch that proposed an alternative approach to manufacturing studies by incorporating skills transfer through practical simulations. The concept will be applied at the simulated working environment (SWE) laboratory in the New Engineering Building on North Campus. Final changes are being made to the system and it is expected to be fully operational in 2014.

A number of new areas for research have been explored including:

- the use of lean tools to reduce energy consumption,
- lean methodologies applied to healthcare, and
- lean in higher education.

International collaboration with manufacturing facilities in Europe received a boost with the signing of a MoU between NMMU and Continental Tyres. Lean training was conducted in the "Conti" plant at Puchov, Slovakia. In addition various visits were undertaken to UK-based universities.

Due to the prohibitively high cost of imported lean texts and the constraints this places on SA lean dissemination, the Unit has begun the task of developing lean texts for local industry and this project includes three major texts as well as two practical instructional guides.

Industry collaboration highlights

The Unit conducted a number of lean interventions in local industry including the following important programmes:

- Western Cape Furniture Initiative (WCFI) – three lean manufacturing workshops held in Cape Town as part of an initiative to make this industry more competitive.
- VWSA Problem Solving Teams – ongoing implementation assistance.
- Women in engineering and leadership (WELA) lean workshops.

For the future, the Unit plans to expand into lean in higher education and lean in healthcare.

eNtsa

Leader: Prof Danie Hattingh

Develop and validate a prototype wind turbine-based novel control means

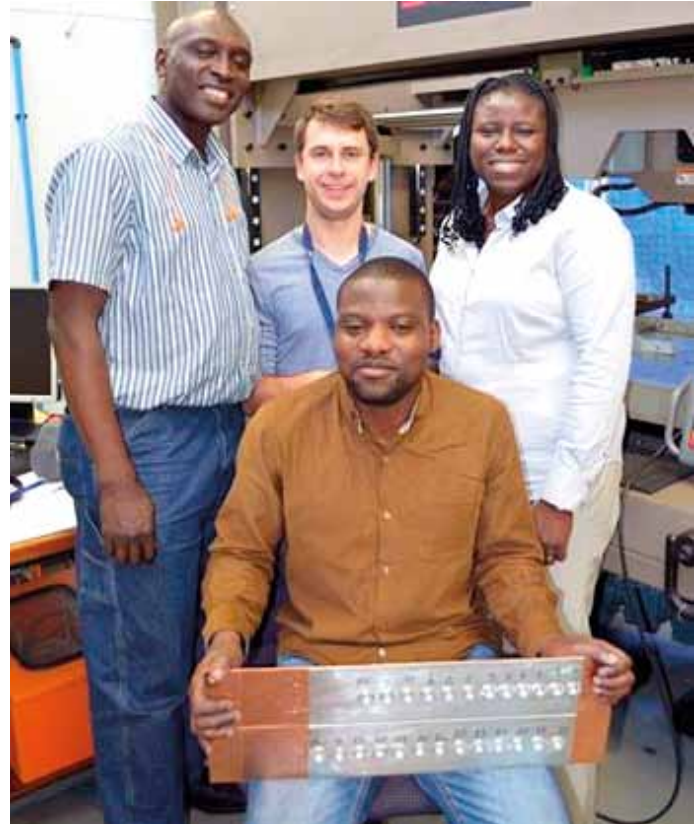
The project's aim was to develop, prototype and evaluate a streetlight that requires no external energy supply. Existing streetlights require a network of power supply cables buried underground or suspended between the poles as well as a grid provided power supply. The cables are susceptible to being stolen, and in some areas grid power is not available and is infeasible to roll out. As a result, these roads and areas remain unlit, proving to be a hazard to motorists and pedestrians, and a haven for criminals.



From left to right: Mr Riaan Opperman (eNtsa Project Engineer), Mr Nikolas Jankovich (local entrepreneur) and Mr Akshay Lakhani (eNtsa Project Engineer) are some of the team members that have been working on the Twerly project.

NMMU and UJ collaboration – Friction Processing of Aluminium and Copper

eNtsa assisted a Doctoral postgraduate student from University of Johannesburg with friction processing research by the utilisation of the MTS ISTIR platform to join Aluminium to Copper plates. Accompanying the student, Patrick Mubiayi, was his promoter, past NMMU DTech candidate, Dr Esther Akinlabi and her husband former MTech candidate, Mr Stephen Akinlabi.



From left to right – Mr Stephen Akinlabi (Senior lecturer in Mechanical Engineering at UJ), Dr Esther Akinlabi (Senior lecturer and supervisor in Mechanical Engineering at UJ), Mr Riaan Brown (Facilities Engineering within Mechanical Engineering at NMMU), Mr Patrick Mubiayi (Doctorate mechanical engineering student at UJ) at the MTS ISTIR platform where they joined Aluminium to Copper plates using the FSW technology

Outputs summary of research outputs

Journal papers	Conference papers	Graduated students in 2013	Students enrolled 2013
9	3	0	2 – M 6 – D

a review of steelmaking and some basic metallurgical principles relating microstructure of metals to their mechanical properties.

Visiting Scientist

Prof Lothar Issler

Failure of Structures and Design Concepts Workshop

Date of Workshop: 19 – 21 November 2013

Prof Dr-Ing. Lothar Issler, renowned international expert, visited NMMU in November 2013. During this visit he hosted a workshop entitled: “Failure of Structures and Design Concepts”. This workshop’s objective was to mainly introduce engineers who are involved in industry, academic institutions, governmental bodies and engineering researchers the technique of failure investigation on one side and the latest and advanced safety and design methods on the other. This initiative was an initiative between NMMU, eNtsa, TIA, and the GIZ.



Local industry, School of Engineering undergraduate- and postgraduate students, School of Engineering staff, eNtsa engineers, GIZ representative, Ellen Hueter (seated in the front) and Prof Issler (standing in front) at the “Failure of Structures and Design Concepts” Workshop hosted at NMMU.

Prof Denis Twigg

Heat Treatment and Surface Engineering of Steels and their Alloys Workshop

Date of Workshop: 25 - 26 September 2013

This workshop was prepared by Professor Denis Twigg for South African engineers and related personnel involved with the heat treatment and surface engineering of steels and their alloys. The content of this workshop covers areas of knowledge, which include the characteristics of materials, the different types of mechanical testing, general causes of failure, etc. Due to the scope of this workshop it will be of value to a wide range of delegates from differing metallurgical backgrounds. The course will commence with

Professor Axel Steuwer

Work on research outputs for 2013/2014

Date of Visit: 10 May 2013

Prof Steuwer presented a technical talk entitled: “Introduction to using lab x-rays for determining surface residual stress”.

Professor Alan Smith and Dr David Asquith

Date of Visit: 16 – 18 July 2013

The visiting scientists led a discussion on prospective research collaboration initiatives within the field of friction processing between NMMU and Sheffield Hallam University. A collaborative relationship was established with Sheffield Hallam University.

Professors Luca Susmel (University of Sheffield), Roberto Tovo (Ferrara University), and Neil James (Plymouth University) Leverhulm project

Date of Visit: 22 – 25 July 2013

Progress meeting on the Leverhulme project, which is an international project focussing on “Multi-axial fatigue of FSW tubes” took place.

Mr Mike Blum

Date of Visit: 21 October 2014

Mr Mike Blum led a discussion around the topic: “Approach to welding manufacturing industry” and viewing of the eNtsa facilities. FPRU and eNtsa members had the opportunity to meet with Mr Blum to discuss possible collaborations and showcase the FP welding facilities at NMMU.

Faculty of Health Sciences

Caring for tomorrow



■ School of Behavioural Sciences

DEPARTMENTS

Department of Environmental Health
Department of Psychology
Department of Social Development Professions

■ School of Clinical Care Sciences

DEPARTMENTS

Department of Emergency Medical Care
Department of Nursing
Department of Radiography

■ School of Lifestyle Sciences

DEPARTMENTS

Department of Dietetics
Department of Human Movement Science

■ School of Medicinal Sciences

DEPARTMENTS

Department of Medical Laboratory Sciences
Department of Pharmacy

| Dean's Overview



Prof Victor Exner
Executive Dean:
Faculty of Health Sciences

The Faculty of Health Sciences was able to meet its mission statement to provide high quality training of health and welfare professionals to meet the needs of the South African community through the quality of its academic and research programmes. Fifty-two candidates completed their Masters or Doctoral degrees during the year. Of the 52 candidates, five staff members received PhD degrees. Many other staff members have registered for a PhD indicating the resolve within the Faculty to have as many staff members as possible holding a Doctoral degree. Six of these staff members attended a series of SANTRUST workshops as part of the preparation of their PhD proposals.

Of the 52 candidates, five staff members received PhD degrees. Many other staff members have registered for a PhD indicating the resolve within the Faculty to have as many staff members as possible holding a doctoral degree.

Staff members have developed interesting areas of research, either as individuals or in collaboration with national and international colleagues. These topics cover important facets of life within the South African community. Professor J Strumpher (Nursing Science) conducted a study pertaining to suicide of patients, particularly in psychiatric hospitals. She and her collaborators identified the impact of patient suicide on the staff of the hospitals and this led to a need for a wider investigation of the factors related to suicide. This latter project received ethical approval for implementation in 2014. Mr K Van Rooyen is involved in studies related to rape, childhood sexual abuse and Post-Traumatic Stress Syndrome.

The Faculty has, through its staff and students, developed an excellent profile at national and international conferences. Twenty-nine podium presentations and 26 poster presentations were made. Of these presentations, 22 were international podium and 17 were international poster presentations. This has increased the Faculty and the University's visibility, nationally and internationally. This visibility led to invitations to staff members to act as session chairpersons on three occasions for both national and international conferences and to nine staff members being recruited onto the editorial boards of research journals either as full board members or as reviewers.

The staff have also been most productive in publishing articles and writing chapters in textbooks with 14 articles published in refereed, DHET accredited journals and other research journals. Eleven book chapters written by staff

members were published during 2013. Professor MB Watson published no less than four chapters and two books in 2013 in collaboration with Prof McMahon of Australia.

The Faculty arranged a very successful Article Writing Workshop led by Prof Andrea Hurst in June in order to increase the skills base in academic publishing within the Faculty. Nine staff members attended this workshop and produced five articles that were accepted for publication. We plan to offer more such workshops in 2014.

Particular highlights of 2013 include a research grant allocated to Prof Cheryl Walter that comes into effect in 2014 and two international research projects involving Professors Dalena van Rooyen and Louise Stroud, respectively. For the past three years, Professor Stroud has been the Lead Researcher in a project of international magnitude - to revise the Griffiths Mental Development Scales. The Griffiths Scales is a culturally compatible method of assessing the development of children from birth to the age of five years eleven months, and is used internationally. She is working on this venture under the auspices of the Association for Research in Infant and Child Development (ARICD), which is based in the United Kingdom. The current revision will be called the Griffiths III and will be launched in London in September 2015.

Professor Mark Watson became the first Distinguished Professor in the Faculty in recognition of his high research profile. Other important researchers, who have come to the fore, include: Professor Cheryl Walter (Human Movement Science), Professor Essie Ricks (the Faculty's Emerging Researcher of the Year) and Dr Portia Jordan (Nursing Science), Prof Ilse Truter (Pharmacy), and Ms Alida Sandison (Psychology).

The Faculty graduated its first cohort of students (59) with the Higher Certificate in Pharmacy Support as part of its commitment to the preparation of all categories of workers for the South African health services. Curricula were also finalised to initiate training programmes for ancillary healthcare workers such as Emergency Medical Care personnel and Clinical Associates. The first intake for this programme will take place in 2014. Full Bachelor degrees in Radiography, Medical Laboratory Sciences and in Environmental Health were finalised and will commence in 2015.

The Faculty graduated its first cohort of students (59) with the Higher Certificate in Pharmacy Support as part of its commitment to the preparation of all categories of workers for the South African health services.

Dr Lena Andersson from the University of Gothenburg visited the Department of Nursing Science to discuss a research project on: "Barriers to healthcare and the right to health for persons with mental illness in South Africa."

Dr Therése Kairuz from the University of Queensland, Australia visited the Department of Pharmacy and the Drug Utilization Research Unit (DURU) in November 2013. Dr Kairuz is a PhD graduate in Pharmacy Practice from UPE and was, until 2002, a staff member in the Department of Pharmacy at NMMU. Dr Kairuz presented a talk entitled "Learning Styles and Effective Teaching – Experiences from three continents" to a group of academics and postgraduate students. Dr Kairuz is collaborating with NMMU on two research projects.

Dr Alon Serper has been a postdoctoral fellow in the Department of Psychology since January 2013. During his stay in the Faculty, he published a number of articles and presented a paper at the Neville Alexander Commemorative Conference in 2013.

The Faculty received a number of approaches from prospective Research Associates (RAs) that we were able to accommodate within our departments. Currently, three such RAs are involved in the Departments of Psychology, Pharmacy and Nursing Science respectively where they use their research expertise to support and supervise our postgraduate candidates.

The Faculty of Health Sciences looks forward to another busy and successful year in 2014.

Prof Victor Exner

Executive Dean: Faculty of Health Sciences

Faculty Researcher of the Year



Prof Mark Watson

Professor Mark Watson's research focuses on lifespan career development. More recently this research has shifted from a predominant focus on adolescence, the lifespan phase traditionally identified in terms of career choice, to the consideration of earlier and later phases of lifespan career development. Two life phases of particular interest have been children and older women. The research on children has explored how their earlier fantasy choices evolve over time. This research has been both longitudinal and practical in nature. The longitudinal research has involved following the same children from the age of six years through to their matriculation year, while the practical research has focused on ways to stimulate children's career thinking and career awareness. The latter research has resulted in doctoral research, which focused on developing a computerised interactive learning tool for primary school children, as well as the initial development over the last year of a set of career conversation cards that could assist both parents and teachers in helping children relate the future world of work to the present realities of their educational environment. Much of this research has involved international collaboration with Dr Mary McMahon from the University of Queensland, resulting in Masters and Doctoral research both here at the NMMU as well as at the University of Queensland.

The focus on older women between the ages of 45 and 65 years has been qualitative in nature in that it has explored the stories that these women have had to tell of their career development over time. Initially involving samples from Australia, England and South Africa, this research has grown into an international project involving women from Argentina, Canada, China, Germany, Italy, and Portugal. This research has involved international research coordination between Professor Jenny Bimrose from the University of Warwick in England and Dr Mary McMahon of the University of Queensland and it will result in a major international book to be published by Routledge in London, *Women's career development through the lifespan: An international perspective*.

Professor Watson's research interests also lie in exploring career development services, particularly in more disadvantaged contexts. This has resulted in two journal publications last year that have explored the

role of career psychology in the South African context. There have been a further three published journal articles and two articles in press. Besides the book on women's career development, Professor Watson published six book chapters last year with a further five book chapters in press. In addition, Professor Watson served as a conference chair and delivered six international conference papers. In this regard, Professor Watson would like to acknowledge the financial support of the National Research Foundation through their Incentive Grant award. Professor Watson is presently on the editorial boards of the *British Journal of Guidance and Counselling* and the *Indian Journal for Career and Livelihood Planning*. He is co-editor of the *International Journal for Educational and Vocational Guidance*.

Professor Watson is a B1 rated scientist, a distinguished professor at the NMMU, an honorary professor at the University of Queensland, an Associate Fellow at the University of Warwick, and a member of the UNESCO Chair for Lifelong Guidance and Counselling.

Faculty Emerging Researcher of the Year



Prof Essie Ricks

The focus of Professor Essie Ricks' research for the past five years has been on establishing how access to information via mobile computing devices (e.g. smartphones and tablets) influenced the clinical decision-making of registered nurses and medical doctors. It is important for registered nurses and medical doctors to have access to information that could facilitate their clinical decision-making when providing patient care. Mobile computing devices have provided the means in making information, which support healthcare delivery when needed. Understanding the information needs of registered nurses and medical doctors has been a prerequisite for designing such a system.

Two projects have successfully been completed between 2008-2013 together with FHI 360 (a Boston-based NGO, the Department of Health, MTN, SA Partners). The research findings revealed that both registered nurses and medical doctors found that having access to information at the point of care enabled them to correctly diagnose patients, prescribe the

correct dosage and medication and selecting the correct diagnostic tests. The available information was also used for empowering patients with regard to their health conditions as well as providing on the spot teaching for students.

Professor Ricks' current research focus is on establishing how the use of mobile computing devices by nursing students in the clinical areas impact on the development of clinical competence and decision-making skills.

Early Career Development Programme



Ms Alida Sandison

Ms Alida Sandison undertakes her research in the broader field of Developmental Psychopathology. Focusing on Narcissism and Anti-Social behaviour tendencies and personality. The Cluster B Personality disorders as it were. Directing her efforts on how we can intervene to protect development. When there is an understanding how Narcissism and Anti-Social behaviour work, and the difficulties they cause, and how they impact others -steps can then be taken to ameliorate these – especially when identified early. Structuring therapeutic interventions hinges on this understanding. A developing personality is more amenable to intervention. These tendencies tend to be exacerbated as age increases. There is a cluster of variables influencing the development of Narcissism and Anti-social behaviour e.g. parenting style, and the child's temperament. Especially when there is a mismatch between the two.

Very little research in South Africa has been undertaken in this area.

Ms Sandison completed a systematic review of the literature, and submitted a PhD proposal, which is a Psychobiography on the life of an individual entitled: "A reflection on Narcissistic Defences and Alienation through the life of Howard Hughes".

She has supervised and co-supervised eight students who completed their Masters dissertations. Furthermore, an article in an accredited journal has been published.

Academic writing does not just happen, one has to learn how to go about it. It takes time to develop the confidence to put your ideas on paper. You need to prioritise, and find the time and the space to do research, notwithstanding the busy schedule that is so characteristic of the life of academics. One of her key considerations has been knowledge generation – in other words, producing research which can be useful, and used in practice.

The more you do, the more you learn. It takes learning how to do research, and how to do so in the best way possible. Therefore researching in ways that would create the best outcome. Research is also a journey of development and personal growth.

More importantly, what research insights that are gained, go into the teaching project, and one's capacity to teach others is increased.

You therefore create value in what you can teach others.

An Early Career Development Programme (ECDP), targeting academics in the early to mid-years of their career. The overarching aims or intentions of the ECDP initiative are to provide an early career development opportunity that will:

- Facilitate participants' commitment to both the national goals for Higher Education in South Africa and an increased commitment to advancing participants' commitment to advancing their own career goals;
- Integrate the tripartite mission of the academic enterprise namely, teaching and learning, research and engagement; and
- Challenge the role of each participant in terms of future academic leadership as a new generation of academics.

UNITS

Name of Department	Units
Nursing Science	3.084
Pharmacy	1.002
Psychology	1.833
TOTAL	5.919

Drug Utilization Research Unit (DURU)

Leader: Prof Ilse Truter



The Drug Utilization Research Unit (DURU) at NMMU has achieved several successes in 2013. Four manuscripts have been published in international peer-reviewed journals, one article in a South African professional journal, and one Master's student graduated. DURU had three PhD students, and one new Master's student, enrolled for their studies in 2013.

A podium presentation was delivered at the European Congress of Epidemiology (EuroEpi) 2013 in Aarhus, Denmark during August on the Transnet-Phelophepa Health Care Train as a potential source of primary healthcare data in rural South Africa. DURU was also invited to give an address entitled: "Pharmacoepidemiology in South Africa: Challenges and Achievements" at the First National Pharmacy Conference organised by the South African Pharmacy Council at Sun City in June 2013.

Further presentations included a lecture at the regional meeting of SACENDU (South African Community Epidemiology Network on Drug Use) on the use and potential abuse of analgesics (a quantitative and qualitative investigation). This was done in collaboration with PhD student, Brent Knoesen. A further joint presentation with Brent Knoesen on the abuse of over-the-counter medicines was presented at the Elizabeth Donkin Hospital Academic Programme's Mental Health Symposium on Substance Use. A lecture on Alzheimer's disease was furthermore given as part of the continuing professional development lecture series at the Elizabeth Donkin Hospital.

A Master's student, Razia Gaida, presented her research at the 11th International Conference on Alzheimer's and Parkinson's Diseases, AD/PD™ 2013, in Florence, Italy. A further seven posters were presented at three other international conferences. Eight posters were also presented at local conferences, including the South African Society of Clinical Pharmacy (SASOCP) Conference 2013 in Centurion, and the 9th Public Health Association of South Africa (PHASA) Conference in collaboration with the

African Federation of Public Health Associations (AFPHA) and the Annual Academy of Pharmaceutical Sciences Conference, Lagoon Beach Hotel, both in Cape Town.

DURU presented two workshops, one on scientific writing skills to postgraduate students, and a short-course on immunisation and injection technique to local pharmacists. One of the projects was awarded the runner-up prize for the best podium presentation at the Annual Pharmacy Department Research Presentation Evening in October 2013. The project was entitled: "Exploring Dutch Remedy use in the Nelson Mandela Metropole" (students: Yumna Adam and Karen Naidoo).

The entity leader served on two NRF panels, and was appointed to review abstracts for three international conferences. She is a member of the Editorial Board of the *International Journal of Pharmacy Practice*, and evaluated several courses for the South African Pharmacy Council in 2013.

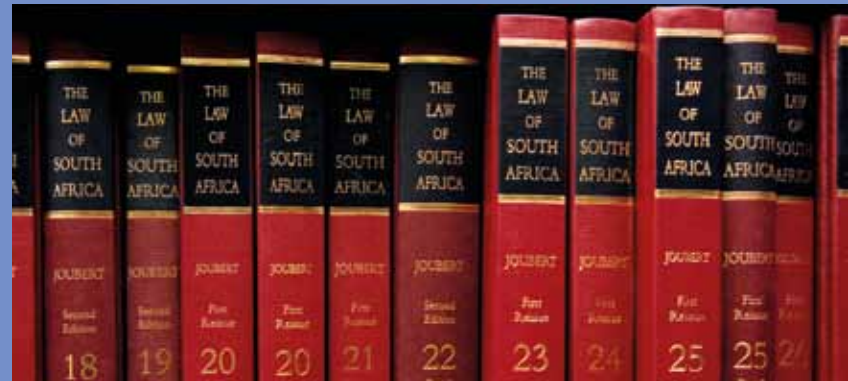
Dr Therése Kairuz from the University of Queensland in Australia visited the Department of Pharmacy and DURU from 18 to 29 November 2013. Dr Kairuz completed her PhD in Pharmacy Practice at UPE and was also a staff member in the Department of Pharmacy at NMMU until 2002. Dr Kairuz presented a talk entitled: "Learning Styles and Effective Teaching – Experiences from three continents" to a group of academics and postgraduate students. Dr Kairuz is collaborating with DURU on two research projects.

The personal highlights of the entity leader was being awarded the Distinguished Pharmacy Teacher of the Year Award of the Academy of Pharmaceutical Sciences in South Africa in 2013, her participation as one of 25 academics in South Africa for the Higher Education South Africa (HESA) HELM LEAD Fellowship 2013. The HELM LEAD Programme is a national Management and Leadership Programme that is aimed at providing relevant and quality training to mid-level personnel and managers of the 23 public universities in order to improve the leadership and management capacity of South African Universities. She was also the delegation leader to review a pharmacy programme for the Council on Higher Education of Lesotho.



Faculty of Law

Defining tomorrow



- Department of Criminal and Procedural Law
- Department of Mercantile Law
- Department of Private Law
- Department of Public Law

Dean's Overview



Prof Vivienne Lawack
Executive Dean:
Faculty of Law

In tune with the research objectives of NMMU's Vision 2020, the Faculty of Law has, over the past few years, concentrated on creating an environment that is conducive to research and innovation and, in so doing, grow the research base to ensure future sustainability. Although the research outputs are slightly down in relation to the previous year, it has to be noted that a concerted effort is underway to enable quite a number of staff members to obtain their Doctorates in Law. To this end, at least six staff members are in various stages of completion of their Doctorates.

A spirit of research collaboration and enthusiasm was fostered. The Faculty is hoping to continually grow its research base through its academics, research associates and honorary and visiting professors. As in the past, for example, Visiting Professor, Prof Pieter Badenhorst of the University of Deakin, Australia, and our Honorary Professor, Prof Eltjo Schrage, professor emeritus of the University of Amsterdam, also made meaningful contributions. In addition, academic staff co-published with alumni and Doctoral students.

Professor Avinash Govindjee was (yet again) the most prolific researcher in the Faculty and was awarded the Faculty of Law Researcher of the Year award at the annual NMMU Teaching, Research and Engagement Awards ceremony. Prof Govindjee also received a C2 rating from the NRF.

Our DST/NRF SARChI Chair in Law of the Sea and Development in Africa, Professor Patrick Vrancken, was very active during 2013; especially as far as setting up the Chair and presenting a host of conference papers are concerned. We thank him for the groundbreaking work that he has started in this area and we look forward to the exciting projects that he has embarked upon.

Professor Avinash Govindjee was (yet again) the most prolific researcher in the Faculty and was awarded the Faculty of Law Researcher of the Year award at the annual NMMU Teaching, Research and Engagement Awards ceremony.

Other collaborations included Professor Mark Tait and Professor Madéle Tait's contribution on mobile money at an international conference, as well as the Dean's contribution to an international conference on mobile money, financial inclusion and financial integrity and the developing world, which led to a special publication in the

Washington Journal of Law, Technology and Arts, together with contributors from other developing countries, the USA and UNCITRAL.

Under the leadership of Professor André Mukheibir, the Department of Private Law once again showcased their research and organisational abilities in hosting the Fifth Private Law and Social Justice Conference. This conference is growing in stature and Private Law academics from all over South Africa attended the conference. Student involvement during the conference also added value for both the students and academics and gave exposure to the students to exhibit the best poster presentations.

Under the leadership of Professor André Mukheibir, the Department of Private Law once again showcased their research and organisational abilities in hosting the Fifth Private Law and Social Justice Conference.

The Faculty of Law values and recognises the contributions made by all its legal scholars, hence the second “Law Oscars”, held in December 2013.

I would like to use this opportunity to thank all our scholars for their commitment and effort in furthering the research mission of the Faculty and the University. I also wish to encourage all our academics who are in the process of completing their Doctorates in Law to do so, knowing full well that this asks for hard work, consistency and commitment. We look forward to this bearing fruit as far as future research output of the Faculty and increase of postgraduate students are concerned.

Prof Vivienne Lawack

Executive Dean: Faculty of Law

Faculty Researcher of the Year



Prof Avinash Govindjee

Prof Avinash Govindjee’s research work focuses primarily on social security law and labour law, also from regional and international perspectives. He has been involved in a range of labour- and social security-related projects for various South African government departments and agencies, most recently in relation to the introduction of return to work arrangements in South Africa, and will shortly commence work on a similar project for the Government of Namibia. Prof Govindjee has published widely in South Africa and abroad on themes broadly related to human rights, with specific emphasis on labour, social security and equality law.

During 2013, he managed to sustain his record of consistently delivering high quality outputs, notably in the form of original research for the social security law component of the authoritative work, *The Law of South Africa*. His research work is having a discernible and significant impact at national and, increasingly, regional and international levels.

A notable highlight for the 2013 year was the receipt of a NRF C2 rating, and inclusion on the Mail and Guardian’s list of “200 Young South Africans”, also in recognition of his research contribution.

Prof Govindjee collaborates extensively with Prof Marius Olivier, Director of the International Institute for Social Law and Policy (based in Perth, Australia), and also works with colleagues affiliated to NMMU, notably Prof Adriaan van der Walt.

A notable highlight for the 2013 year was the receipt of a NRF C2 rating, and inclusion on the *Mail and Guardian's* list of "200 Young South Africans", also in recognition of his research contribution. Prof Govindjee plans to continue working in areas involving the intersection of labour and social security law, and on matters which can contribute to the practice of law, with particular focus on the work of the CCMA in unfair discrimination cases.

Law of the Sea



One of the main initiatives taken by the incumbent of the South African Research Chair in the Law of the Sea and Development in Africa was to take a leadership role, together with colleagues at the University of Cape Town and the Norwegian government, to conceptualise and establish PescaDOLUS, an independent research and capacity-building network with a main focus on innovative inter-disciplinary solutions addressing transnational organised fisheries crime with a particular emphasis on meeting the needs of developing nations and promoting north-south collaboration.

The aims of PescaDOLUS include being a network for researchers and experts on transnational organised fisheries crime; nurturing an environment for the exchange of ideas and research on transnational organised fisheries crime; (iii) being a bridge and facilitator for multi-disciplinary research into transnational organised fisheries crime; (iv) supporting, promoting and building capacity in law enforcement agencies to address transnational organised fisheries crime; and (v) acting as a resource of independent information, expertise and research on transnational organised fisheries crime for civil society and state actors.

Within a few months, the initiative resulted in the launching of an international and multidisciplinary book project as well as the granting of substantial seed funding by the Norwegian government.

UNITS

Name of Department	Units
Criminal and Procedural Law	1
Mercantile Law	2.5
Private Law	5.5
Law Management	2.5
TOTAL	11.5

Fifth Annual Private Law and Social Justice Conference

The Fifth Annual Private Law and Social Justice Conference was held on 19 and 20 August 2013 at the North Campus Conference Centre. The Conference was very well attended and for the first time since its inception in 2009, it was necessary to have a parallel session due to the number of speakers who delivered papers. It was also the first time that the majority of papers were delivered by speakers who had responded to the call for papers made. In previous years, the Conference organisers had invited most of the speakers and participants from our own faculty dominated the conference programme. This year speakers came from many South African universities, including the Universities of KwaZulu-Natal, Johannesburg, Cape Town, Stellenbosch, South Africa, the Witwatersrand, as well as our neighbour, Rhodes University. We had a number of international speakers as well, namely Dr Suvanna Hakaetho-Wainio from Finland and Prof Eltjo Schrage from Amsterdam.

The programme included a number of topics on the interplay between the traditional private law rules and the broad notion of social justice. There were papers on hate speech, the interplay between freedom of contract and freedom of religion, same-sex unions, to name but a few.

Many of our students attended the conference, thanks to sponsorships from the Faculty of Law, and for all of them it was a very positive experience. For the first time we also had non-speaking delegates (other than our students) attend the conference, in particular young academics from the University of South Africa. Many of these academics came to observe with a view to delivering papers in the future.

Prof David McQuoid-Mason, the father of Street Law and an NRF A-rated researcher, delivered the address at the Gala Dinner. It was an inter-active address and it was both educational and very entertaining. The theme of the address centred on the notion of Umqombothi, or African beer. Prof McQuoid-Mason had a number of the guests sample some beer out of a clay jar. The faculty choir, Voces lusitiae, in addition to providing entertainment to our guests, gave a musical introduction to our guest speaker.



Prof Eltjo Schrage



Prof David McQuoid-Mason

Over the past five years the conference has grown in stature and has become one of the flagship events of the Faculty. It is recognized nationally as one of the best and most well-organised conferences in the country, despite the fact that the conference team consists of two staff members and two students. This is borne out by the number of speakers who return every year. Our hope is that we can in years to come market this conference as a truly international conference.

Prof A Mukheibir (Conference Organiser)

Faculty of Science

Discovering tomorrow



■ School of Biomolecular and Chemical Sciences

DEPARTMENTS

Department of Biochemistry and Microbiology
Department of Chemistry
Department of Textile Science

■ School of Computer Science, Mathematics, Physics and Statistics

DEPARTMENTS

Department of Computing Sciences
Department of Mathematics and Applied Mathematics
Department of Physics
Department of Statistics

■ School of Environmental Sciences

DEPARTMENTS

Department of Agriculture and Game Management
Department of Botany
Department of Geosciences
Department of Zoology

■ School of Natural Resource Management

| Dean's Overview



Prof Andrew Leitch
Executive Dean:
Faculty of Science

The Faculty of Science can look back on the past year with a great sense of satisfaction. The filling of the three newly acquired DST/NRF SARCHI Chairs in the Faculty of Science was one of the highlights for the Faculty in 2013. Together with its existing two DST/NRF SARCHI Chairs, these have provided a tremendous boost for the Faculty in the following strategic areas:

- Earth Systems Science, located in the Earth Stewardship Science Research Institute;
- Microfluidic Biochemical Processing, located in the Institute for Chemical Technology, InnoVenton;
- Maths Education, located in the Govan Mbeki Maths Development Unit;
- Nano-Photonics, located in the Department of Physics; and
- Shallow Water Ecosystems, located in the Coastal and Marine Research Institute.

The filling of the three newly acquired SARCHI Chairs in the Faculty of Science was one of the highlights for the Faculty in 2013.

In an effort to focus our research and to encourage collaboration, the following research themes have been defined and emphasised for the Science Faculty:

1. Renewable Energy for the Future;
2. Sustainable Environmental and Natural Resource Management;
3. Conservation and Ecology;
4. Coastal and Marine Science;
5. Novel Materials, Products and Processes;
6. Science, Maths and Technology Education for a Changing World;
7. Computing Solutions;
8. Electron Microscopy and Analytical Science;
9. Disease Mechanisms and Novel Treatments; and
10. Abstract Algebra.

In each of these research themes, exciting research is being conducted, leading in turn to scientific papers in international journals and presentations at prestigious conferences. The training of Masters, Doctoral students through these projects always remains central to the Faculty's research focus.

Our commitment towards establishing an Institute for Coastal and Marine Research gained further momentum during 2013. In August, the Faculty formalised a partnership with the South African Environmental Observation Network (SAEON) and the South African Institute for Aquatic Biodiversity (SAIAB). The MoU signed between the three parties facilitates collaboration through joint projects and the sharing of resources that will significantly raise the profile of marine research activities for South Africa. A further exciting development for the Faculty was to add two new programmes – the Masters and Doctoral degrees in Oceanography, to its existing postgraduate programme qualification mix (PQM).

In August, the Faculty formalised a partnership with the South African Environmental Observation Network (SAEON) and the South African Institute for Aquatic Biodiversity (SAIAB).

The micro-algae project of InnoVenton continued to experience great success during 2013. This innovative project has attracted considerable financial commitment from government as well as industry partners. The present challenge facing InnoVenton is the manner in which the project can be scaled up to industry scales for commercialisation.

Towards the end of 2013, the Faculty signed an MoU with REDISA (Recycling and Economic Development Initiative for South Africa). The multimillion rand project will focus on setting environmental standards for tyre qualities, and researching tyre waste material and other rubber compounds for the South African economy.

Tremendous advances were made during 2013 with establishing a research culture on our George Campus. With the help of Support Services, space in an existing building was made available and suitably refurbished to provide our growing number of postgraduate students on that campus with a Research Commons. Under the mentoring eye of Prof Christo Fabricius, the postgraduate students meet regularly to engage in stimulating and challenging discussions linked to the focus of his Sustainable Research Unit as well as Natural Resource Management. For the first time, the George Campus postgraduate students travelled to the Summerstrand Campus in Port Elizabeth to participate in a workshop specially organised to bring the Science students from different campuses together. It turned out to be a great success, and will become a regular activity for the Faculty of Science – alternating each year between George and Port Elizabeth.

On the subject of research collaboration, another exciting experiment took place during 2013, with the “Science meets Art meets Place” field excursion

for senior Botany and Arts students. To grow the opportunities for dialogue across the traditional Faculty and disciplinary divides, we intend to repeat the field excursion in the future.

On the subject of research collaboration, another exciting experiment took place during 2013, with the “Science meets Art meets Place” field excursion for senior Botany and Arts students.

Finally, I wish to pay tribute to the excellent administrative service provided by our Faculty Office in support of our nearly 300 Masters and Doctoral students who are registered for various degrees in the Faculty. The support spans a wide range of services, from assisting the students with the initial application process, to the processing of Faculty incentive bursaries for having published an international paper, and to providing financial support for those students who have results accepted for presentation at an international conference. All this has enabled the Faculty to create a stimulating research culture for our postgraduate students, in the process raising the profile of NMMU as an institution known for its research, which makes a critical and constructive contribution to sustainable development in Africa and further afield.

Prof Andrew Leitch
Executive Dean: Faculty of Science

Faculty Emerging Researcher of the Year



Dr Gill Dealtry

Dr Gill Dealtry's research is in the fields of cell biology, molecular biology and immunology. Currently, she conducts cellular and molecular analyses of human and animal responses to medicinal plants, with the aim of identifying the activity of different plant extracts and their potential to provide new therapies for Type 2 diabetes. Dr Dealtry focuses on changes in gene expression leading to the development of Type 2 diabetes, and the effects of medicinal plant extracts on these. She wants to know what changes occur in the liver in response to sugar and fat in the diet, what is the role of inflammation in Type 2 diabetes and whether the plant extracts can prevent or treat these disease associated changes.

This work extends from research she began whilst a postdoctoral researcher with Professors M van de Venter and S Roux in the Department of Biochemistry, NMMU. To date she has supervised or co-supervised two PhD students and two Masters students, with two further PhD students and a postdoctoral researcher currently working in her group. In 2013, her group presented their work at the Physiology Society of Southern Africa and the International Diabetes Federation World Congress in Melbourne and published a paper in *Journal of Ethnopharmacology*. "We are extending this work in collaboration with Prof JR Botha in the Department of Physics to use Atomic Force Microscopy to investigate changes in the surface of inflammatory cells treated with our plant extract".

Dr Dealtry has also established applied research based on her expertise in microscopy and molecular biology, which has developed and validated methods to enumerate the virus *Cryptophlebialeucotretagranulovirus* as a biopesticide for False Codling Moth, a pest of citrus fruit. This group is co-supervised by Prof M Lee from HRTEM, Department of Physics, NMMU and Dr S Moore from Citrus Research International. One Master's student graduated in 2012. A second Master's student started research in 2013 into the degradation of the virus biopesticide by sunlight and UV, with the aim of determining the optimal reapplication periods for the biopesticide on citrus crops. The work has generated three published short papers, with associated presentations at the Microscopy Society of Southern Africa Congress in December 2012 and 2013.

Dr Dealtry collaborates with other research groups in South Africa by training postgraduate students in quantitative PCR, including Prof G Bradley (University of Fort Hare), with two papers published from their collaboration; and Dr S Govender and Prof T Downing (NMMU), with whom she has co-supervised Honours students. Dr Dealtry maintains a collaboration with Prof N Fernandez (University of Essex, UK), focused on the bioimaging of cell surface identity molecules. Her future plans are to continue and extend this work.

Functional Analysis Specialist



Dr Martin Weigt

Dr Martin Weigt's research specialization is in functional analysis. His current research interests are in topological algebras, operator algebras and algebras consisting of unbounded operators. This field has been developed in the late nineteen-thirties by John von Neumann with his conception of von Neumann algebras in order to provide an adequate mathematical foundation for quantum mechanics, which came about a decade earlier in about 1926. In 1943, this was developed further by I. M. Gelfand and MA Naimark with the concept and characterization of C^* -algebras. Since then, the study of von Neumann algebras and C^* -algebras (i.e. operator algebras) has become a well-developed and important branch of mathematics, in which currently many researchers across the world are active. The development of the study of algebras consisting of unbounded operators was initiated in the nineteen-sixties due to the fact that unbounded operators arise in quantum mechanics, and are currently not as well developed as C^* -algebras and von Neumann algebras.

Dr Weigt's research over the last few years, and up until the present moment, is in collaboration with Professor Maria Fragoulopoulou and Dr I Zarakas of the Department of Mathematics of the University of Athens in Greece.

It is well-known that a commutative C^* -algebra has no nonzero derivations, and that every derivation of a (not necessarily commutative) C^* -algebra is continuous. By a derivation of an algebra, meaning a linear map such as that, that Dr Weigt and his collaborators have been looking

at generalized B^* -algebras, initiated by G R Allan in 1967, and are locally convex algebras, which are generalizations of C^* -algebras. These algebras consist of unbounded operators, and little is known about their derivations, compared to C^* -algebras, although some results in this direction have already been obtained by C. Brodel and G. Lassner in 1975, and R. Becker in 1992. This motivated the researchers to initiate a study of derivations of generalized B^* -algebras. In January of 2013, while on a study visit to the Department of Mathematics of the University of Athens, Dr Weigt and his collaborators finalised the article "Derivations of generalized B^* -algebras" in which they proved that every commutative GB^* -algebra having jointly continuous multiplication has no nonzero derivations, thereby extending the corresponding result for commutative C^* -algebras mentioned above. This paper has been accepted and published in the journal, *Extracta Mathematicae*.

It is an open problem whether or not every derivation of a (not necessarily commutative) GB^* -algebra is continuous, and during his study visit last year, he made some progress in answering this question in showing that every derivation of a smooth complete metrizable GB^* -algebra is continuous. This result was the subject of another article, which Dr Weigt and his colleagues later submitted to a journal for consideration for publication, of which they are still awaiting the outcome. Further progress to the problem mentioned above was made in July last year, in which they proved that every derivation of a complete metrizable GB^* -algebra, with underlying C^* -algebra being a von Neumann, is continuous. At around the same time, they borrowed techniques from algebraic geometry in order to initiate a study of unbounded derivations of commutative generalized B^* -algebras, and they gave an example of a commutative generalized B^* -algebra having a nonzero derivation. Recall here that commutative C^* -algebras have no nonzero derivations. These results were presented at the Annual Congress of the South African Mathematical Society last year in November, as well as the International Workshop on Operator Theory and its Applications hosted by the Indian Institute of Science in Bangalore, India, in December of last year. The results presented at the latter workshop were written up in the form of the conference proceeding article, entitled: "Unbounded derivations of commutative generalized B^* -algebras" and has recently been accepted for publication.

Unique niche research on young fishes

Dr Nadine Strydom conducts research on fishes at NMMU and is based in the Zoology Department. Her fish research fills a unique national niche area focused on young fishes occurring in shallow water nursery areas in a variety of habitats in South Africa: nearshore ocean, estuaries and more recently, rivers and lakes in the Port Elizabeth Metropole.

In 2008, she joined the Zoology Department at NMMU as a NRF Y2 rated young scientist receiving her C2 rating in 2011. In her professional career, spanning over 12 years, Dr Strydom has published 39 research papers in ISI rated journals.



Dr Nadine Strydom

Dr Strydom is particularly interested in distribution, abundance, movement, feeding, and habitat use by the larval and juvenile stages of coastal fishes. Most marine fish hatch from eggs that are spawned by adults in the ocean. The larvae of these species undergo a metamorphosis as they drift shoreward aided by wind and tide driven currents. Once larvae develop a caudal (tail) fin, they become very competent swimmers that make their way to shallow water nursery areas along the South African coast, particularly estuaries, surf zones and nearshore reefs. The success of any fish population is underpinned by the success of the larval phase. Larvae need to seek out suitable food-rich, sheltered nurseries in order to grow into juvenile fish. It is in this phase of the life cycle that scientists know very little. In the past decade, Dr Strydom has made significant progress in the understanding of the early life history requirements, including nursery areas, for coastal fishes thereby furthering knowledge, conservation and management of South African fishes.



Larval stage of the Dusky kob, *Argysosomus japonicus* at two weeks old (4.5mm).

In 2013, Dr Strydom had numerous postgraduate research projects underway. An extensive PhD study into the habitat use of larval stage fishes in Algoa Bay was completed. This work assessed the role of different types of habitats, such as reefs, estuary mouths and surf zones, in the Bay in the settlement choices of young fishes. Novel new approaches were used to

model fish spawning areas using regressive vector plotting techniques in conjunction with an oceanographer. New information has come to light about fish spawning along the Eastern Cape coast. It was previously thought that important species like Dusky kob spawn offshore, but findings from NMMU research show this species and others to be spawning in and near Algoa Bay. Three papers have been published from this study with a further two in review with international journals.

An extensive research cruise aboard the METEOR, a German research vessel, was undertaken in 2013 following a cruise track from Walvis Bay, Namibia to Mauritius in the western Indian Ocean. This trip enabled sample collection of fish larvae in the Agulhas Current off Port Elizabeth to supplement species being described in a book being written by Dr Strydom on the early stage fishes of temperate South Africa. The cruise also facilitated collaboration with world leaders in the oceanography of the Agulhas Current. A new joint research project on the entrainment or loss of pelagic fish larvae from the Agulhas Current is underway in collaboration with Dr Arne Biastoch from GEOMAR, Kiel, Germany.



Microscope identification of the planktonic stages of Barracuda fish larvae caught on the continental slope bordering the Agulhas Current. Dr Strydom lectured a short course in ichthyoplankton identification on board the ship to African and German students in oceanography and biological oceanography.

Dr Strydom is also studying pelagic fishery species (Anchovy and Sardine) and the role that the Algoa Bay region serves as a spawning and larval grow-out area. It was long believed that sardine spawn only off the west coast of South Africa, but Dr Strydom's research has shown that a viable spawning population exists in the region. It is still unknown how well the larvae of these species do in a relatively nutrient poor bay when compared with the typical food-rich upwelling zones off the west coast where spawning usually occurs. In collaboration with a colleague from GEOMAR in Kiel, Germany, Dr Strydom brought a unique biochemical technique to South Africa to assess body condition of sardine and anchovy larvae in Algoa Bay and compared these to west coast larvae to assess the general health and survival probabilities of local larvae. The technique makes use of RNA:DNA ratios in body tissues as an indicator of fish growth.



Sorting plankton samples collected from the Agulhas Current using Bongo nets to sample plankton.



In port in Mauritius after a three week research cruise aboard the METEOR in collaboration with the University of Hamburg and the oceanographers from GEOMAR, Kiel, Germany.

Dr Strydom first applied this technique in an estuarine context in 2013, fine-tuning the method for new applications assisted by a postdoctoral student and Prof Carminita Frost in the Department of Biochemistry, NMMU. This technique was successfully reworked for a world-first application in estuaries to assess body condition of the estuary round-herring, a close cousin of the sardine, in response to varying food patch quality in estuaries. The herring is an important fodder fish in estuaries and densities of this species underpins the success of fish populations in estuaries.

The first ever comprehensive pollution study on the Swartkops Estuary was completed to assess the accumulation of heavy metals and organic pollutants in the food chain, culminating in fish and birds. Many people eat the fish from this urban estuary and new findings have resulted in consultation with the Municipality to caution the consumption of fish from the Swartkops. Fish tissues were found to be loaded with Cadmium, often far in excess of international safe standards for food stuffs. This work has resulted in further collaboration with the Department of Water Affairs local scientists to source the origin of Cadmium and other heavy metals polluting the fishes in the estuary.

Ongoing work on estuaries includes fine-scale habitat use by fishes in regional estuaries, including assessing the effects of climate change water-chemistry scenarios on common marine fishes using estuaries as nursery areas. Some local estuarine work has expanded into the adjoining rivers. The Baakens River in the NMB Metro is the focus of current research, initiated in 2013, to assess the population status of endangered fishes in the system. Concerns over the status of fishes were raised by members of the community after frequent sewage spills and domestic waste dumping into the Baakens River.

Findings from this study have highlighted the plight of the Eastern Cape redfin, whose population is now on the brink of local extinction in the Baakens, primarily as a result of poor water quality in the Baakens, siltation of spawning areas for this fish and the population of an aggressive alien fish, the southern Mouth Brooder, introduced into the Baakens by members of the public as unwanted aquarium fish. This work is being undertaken in conjunction with Dr Olaf Weyl of the South African Institute for Aquatic Biodiversity. The Baakens River is also home to rare fishes, the current study has revealed a potentially new species of fish, but more specimens are required for genetic analysis of the species.



*Potentially new species of goby, *Stenogobius ?polyzona* collected by Dr Strydom and her student in the lower Baakens River, just above the tidal head of the estuary near the Bridge Street Brewery.*

UNITS

Name of Department	Units
Agriculture and Game Ranch Management	0.5
Botany	24.293
Geosciences	7.26
Zoology	25.52
Biochemistry and Microbiology	4.875
Chemistry	18.574
Textile Science	0.99
InnoVenton	0.72
Mathematics and Applied Mathematics	3.331
Statistics	1.499
Physics	16.026
Computing Sciences	2.166
Natural Resource Management, George	3.84
TOTAL	109.594

Sustainable Research Unit

Leader: Prof Christo Fabricius



Prof Christo Fabricius

The Sustainability Research Unit (SRU) at NMMU's George Campus at Saasveld, with Prof Christo Fabricius as leader, has convened an international team of resilience scientists from Arizona State University in the USA, University of Exeter in the UK and three French research institutions (IRSTEA, CIRAD and CNRS) to assess human adaptations to climate change in coastal zones. The project, called MAGIC (Multi-scaled Adaptations to Global change In Coastlines) focuses on individual and organisational adaptations and their linkages with vulnerability and resilience, and is funded by the Belmont Forum via NRF and DST.

The team has identified three “district”-level coastal case studies in the Garden Route, Cornwall and the Camargue where they are looking at adaptations, maladaptations and vulnerability through the lens of resilience in social-ecological systems. So far they have found that the drivers of change in coastal areas often act synergistically with complex non-linear feedbacks across space and time. When governance systems, resource users, natural resources and climate change interact, this can have complex and unpredictable outcomes. Innovative approaches to adaptation assessment are therefore required. While many adaptations have good outcomes, some adaptations may be dangerous for human vulnerability. Coastal adaptation plans have become increasingly popular, but few of these plans have considered their consequences for people and ecosystems beyond their intended focus.

By adopting a social-ecological systems approach, with a focus on the interactions between individual users, governance systems and resource systems, the team can look beyond the immediate impacts of adaptations. The team uses a combination of mathematical models, participatory action research, interviews and surveys to help planners consider the unforeseen impacts of their plans and interventions, before there is trouble. For this to work we need to engage in a learning process with stakeholders instead of developing top-down adaptation plans or models in isolation.

In doing this research, the SRU is also playing an important role in making stakeholders aware of their roles as environmental stewards. We are currently working with farmers, associations, local communities and officials in the Wilderness area to stimulate a culture of caring for our environment, making sure resources are equally distributed and that nobody is unfairly deprived of access to resources, and caring for the interests of society as a whole, including future generations. This builds community resilience and reduces people’s vulnerability to a range of changes, shocks and surprise, including climate change.

In our research the SRU continuously engages with society by hosting deep and open conversations, which we call “Sustainability Dialogues”. These dialogues may include small group meetings where people are asked to identify places of special value to them, as well as threats to such areas. They also include group meetings, where role players with different interests get together in our Sustainability Café’s to share their fears and aspirations, and where we share research findings with them. Our secret is to give them good coffee in a nice place (mostly at Saasveld), which says “you matter”, asking the right questions and then sitting back and listening to and documenting the ensuing conversation through the lens of our social-ecological systems and resilience framework. During 2012 and 2013, our postgraduate students and staff hosted several panel discussions, conducted scores of group conversations and interviewed hundreds of individuals and community leaders. We appointed a dedicated Knowledge Broker and did our best to attend every available community meeting, even if only to show a presence, but mostly to facilitate conversations. We also conduct participatory mapping exercises with farmers, ratepayers associations, township residents and conservation interest groups. Our team regularly writes articles in local community newspapers or feed information to journalists to raise awareness.

All this information feeds into our research by being captured in databases and Geographic Information Systems, and used later, almost like a “mirror”, to reflect stakeholders’ fears, special interests, values and aspirations to them. The end result of all this, we hope, will not only be limited to research outputs, but will also catalyse the formation of governance systems that are truly representative of the different interest groups in society. In this way we are playing an active role in managing the Garden Route’s ecosystems for the benefit of everyone. Ours is a long-term project, founded in the theories of resilience, social learning, common pool resource management, motivational theory, and adaptive co-management. Apart from publishing our insights and new adaptation and learning theories in peer reviewed journals and working with our international partners to develop cutting-edge models, our vision is that ten years from now there will be a revolution in the way land users manage their ecosystems, together, around a common stewardship vision.



Sustainability dialogues such as this one, facilitated by Bianca Currie of the SRU, bring different role players together in a neutral place to openly discuss their assumptions, concerns and solutions to common problems. The SRU hosts regular dialogues to bridge cultural, political, historical, and sectoral barriers and boundaries.



Techniques such as participatory mapping not only provide valuable data, but also build trust and generate new awareness about environmental threats and novel solutions. Here members of a community-based programme called the “Seven Passes Initiative” near Hoekwil are discussing threats to the Touw River, using a map as focal object for a discussion facilitated by SRU students.



Through a participatory action research project conducted in collaboration with CSIR, and funded by the Water Research Commission, SRU staff and students are working with farmers, ratepayers, conservation authorities and township communities to co-create a collective vision for the Wilderness catchment and its people.

Doctorates

■ Faculty of Arts

DOCTOR OF LITERATURE

OKETCH, Selline Atieno

(English)

Title of Thesis:

THE CHANGING IMAGE OF WOMEN IN FRANCIS IMBUGA'S OEUVRE

Promoter: Prof HE Janse Van Vuuren

Co-Promoter: Prof ME West

DOCTOR OF PHILOSOPHY

KIBUI, Agnes Wanja

(Conflict Management)

Title of Thesis:

THE ROLE OF CONFLICT MANAGEMENT IN MAINTENANCE OF DISCIPLINE: THE CASE OF KENYA'S PUBLIC SECONDARY SCHOOLS

Promoter: Dr G Bradshaw

Co-Promoter: Prof LW Kibera

KUREBWA, Jeffrey

(Public Administration)

Title of Thesis:

RURAL WOMEN'S REPRESENTATION AND PARTICIPATION IN LOCAL GOVERNANCE IN THE MASVINGO AND MASHONAL AND CENTRAL PROVINCES OF ZIMBABWE

Promoter: Prof FA Obeng

Co-Promoter: Prof RS Masango

LAUVIK, Kjell Erik

(Conflict Management)

Title of Thesis:

HOSTAGE INCIDENT MANAGEMENT: PREPAREDNESS AND RESPONSE OF INTERNATIONAL NON-GOVERNMENTAL ORGANISATIONS

Promoter: Dr L Snodgrass

Co-Promoter: Prof TV Mayekiso

LUKUSA, Adolphine Cama

(Media Studies)

Title of Thesis:

CHALLENGES TO CORPORATE AND BRAND IMAGE IN MULTI-NATIONAL COMPANIES ACROSS DIFFERENT LINGUISTIC AND SOCIO-ECONOMIC MARKETS: A SEMIOTIC ANALYSIS

Promoter: Dr J Wozniak

Co-Promoter: Dr HMB Thomas

MBINJAMA-GAMATHAM, Adelina

(Media Studies)

Title of Thesis:

AN INVESTIGATION OF THE QUESTION OF CYBER-ETHICS IN SOCIAL MEDIA-COMMUNICATIONS WITHIN SELECTED SOUTH AFRICAN NGOS

Promoter: Prof B Olivier

Co-Promoter: Dr K Asmah-Andoh

MFENE, Primrose Nompandolo

(Public Administration)

Title of Thesis:

LEADERSHIP AND ACCOUNTABILITY OF WARD COUNCILLORS IN SOUTH AFRICAN MUNICIPALITIES: A CASE STUDY OF BUFFALO CITY METROPOLITAN MUNICIPALITY

Promoter: Prof V Notshulwana

Co-Promoter: Prof JD Taylor

OSUNKUNLE, Oluyinka Oludolapo

(Media Studies)

Title of Thesis:

PARTICIPATORY RADIO AS THE VOICE OF THE COMMUNITY: A COMPARATIVE STUDY OF SELECTED RADIO STATIONS IN THE EASTERN CAPE, SOUTH AFRICA

Promoter: Dr J Wozniak

SHAI, Elisante Walter

(Public Administration)

Title of Thesis:

INVESTIGATION INTO CAUSES OF SERVICE DELIVERY PROTESTS IN MUNICIPALITIES: A CASE STUDY OF NELSON MANDELA BAY MUNICIPALITY

Promoter: Prof JD Taylor

Co-Promoter: Prof K Raga

■ Faculty of Business and Economic Sciences

DOCTOR OF BUSINESS ADMINISTRATION

ADENDORFF, Christian Michael

Title of Thesis:

POSSIBLE FUTURES FOR THE REPUBLIC OF SOUTH AFRICA TOWARDS 2055

Promoter: Prof A Roux

Co-Promoter: Prof JA Jonker

BOSIRE, Samuel Mobisa

Title of Thesis:

A SUSTAINABLE REPORTING FRAMEWORK FOR SOUTH AFRICAN HIGHER EDUCATION INSTITUTIONS

Promoter: Prof AP Calitz

Co-Promoter: Dr MDM Cullen

ROUX, Louis Johannes

Title of Thesis:

CLIMATE CHANGE MITIGATION STRATEGIES AND ITS EFFECT ON ECONOMIC GROWTH

Promoter: Prof HR Lloyd

Co-Promoter: Dr EJ Zeelie

VAN DEN BERG, Ruan

Title of Thesis:

AN EXAMINATION OF CHRISTIAN VALUES AND CORRELATED CONCEPTS IN SMALL BUSINESS PRACTICES IN SOUTH AFRICA

Promoter: Prof CM Adendorff

Co-Promoter: Dr D Hermann

WAWERU, Ruth Wambui

Title of Thesis:

COMPETITIVE STRATEGY IMPLEMENTATION IN MICRO FINANCE ORGANISATIONS IN KENYA

Promoter: Prof EE Smith

WELMAN, Abraham Jacobus Fredrik

Title of Thesis:

THE DEVELOPMENT OF AN INTEGRATED VALUE CHAIN COST REDUCTION METHODOLOGY

Promoter: Prof JJ Pieterse

DOCTOR OF COMMERCE**GORLACH, Vsevolod Igorevich**

(Economics)

Title of Thesis:

THE IMPACT OF ECONOMIC FREEDOM ON ECONOMIC GROWTH IN THE SADC

Promoter: Prof P Le Roux

SALE, Michael Charles

(Economics)

Title of Thesis:

THE APPLICATION OF PROPERTY VALUE MODELS TO ASSESS GOVERNMENT HOUSING POLICY: A NELSON MANDELA BAY CASE STUDY

Promoter: Prof M Du Preez

DOCTOR OF PHILOSOPHY**WOOD, Robert Jameson**

(Development Studies)

Title of Thesis:

BUSINESS, STATE AND SOCIETY IN THE WESTERN CAPE FROM 1960 TO 1990

Promoter: Prof RJ Haines

Co-Promoter: Prof HR Lloyd

DOCTOR OF PHILOSOPHY IN COMMERCE**MUGANO, Gift**

(Economics)

Title of Thesis:

THE IMPACT OF TRADE LIBERALISATION ON ZIMBABWE

Promoter: Prof P Le Roux

Co-Promoter: Dr M Brookes

SHEEFENI, Johannes Peyavali Sheefeni

(Economics)

Title of Thesis:

MONETARY POLICY IN NAMIBIA, 1993 - 2011

Promoter: Prof MK Ocran

KIBOI, Anne Wanjiru

(Business Management)

Title of Thesis:

FACTORS AFFECTING STRATEGY IMPLEMENTATION IN STATE CORPORATIONS IN KENYA

Promoter: Prof S Perks

Co-Promoter: Prof EE Smith

MBUTHIA, Lydia Muthoni

(Business Management)

Title of Thesis:

THE INFLUENCE OF SERVICE PERFORMANCE MEASUREMENT ON SERVICE DELIVERY: EXPECTATIONS OF UNIVERSITY STUDENTS IN KENYA

Promoter: Prof NE Mazibuko

Co-promoter: Prof M Tait

McLAREN, Joseph Ignatius

(Business Management)

Title of Thesis:

THE INTERFACE BETWEEN FINANCIAL MANAGEMENT AND MARKETING MANAGEMENT IN SOUTH AFRICAN BUSINESSES

Promoter: Prof FW Struwig

VALLABH, Dinesh

(Business Management)

Title of Thesis:

CUSTOMER RELATIONSHIP MANAGEMENT IN SMALL TO MEDIUM TOURISM ENTERPRISES (SMTes) IN THE EASTERN CAPE PROVINCE

Promoter: Prof L Radder

Co-Promoter: Mr DJL Venter

VAN DEN HEEVER, Thomas Stanley

(Business Management)

Title of Thesis:

PERCEIVED VALUE CREATION IN TECHNOLOGY-BASED ENTREPRENEURIAL BUSINESSES

Promoter: Prof E Venter

Co-Promoter: Dr MJ Scheepers

■ Faculty of Education

DOCTOR OF PHILOSOPHY IN EDUCATION

BRITZ, Hendrina Wilhelmina

Title of Thesis:

THE USE OF GEOGRAPHICAL INFORMATION SYSTEMS FOR THE PROMOTION OF SPATIAL COGNITION, SPATIAL PERSPECTIVE TAKING AND PROBLEM SOLVING IN SCHOOL LEVEL GEOGRAPHY

Promoter: Prof P Webb

Co-Promoter: Dr L Meiring

HENDRICKS, Charlotte Augusta

Title of Thesis:

ENHANCING PARENTAL INVOLVEMENT IN PRIMARY SCHOOLS IN DISADVANTAGED COMMUNITIES

Promoter: Dr CF Pienaar

Co-Promoter: Dr S Mbokodi

HLONGWANE, Boy Thembinkosi

Title of Thesis:

RURAL SECONDARY SCHOOL TEACHERS' EXPERIENCES OF JOB SATISFACTION AND THEIR EXPECTATIONS OF SUPPORT TO DEVELOP THEIR PROFESSIONAL COMPETENCIES AS CURRICULUM WORKERS

Promoter: Prof P Singh

Co-Promoter: Dr T Morar

KADER, Cheryl Brenda

Title of Thesis:

FEMALE YOUTH IN AN URBAN SETTING CONCEPTUALISING AND NEGOTIATING "SUGAR DADDY" RELATIONSHIPS IN THE CONTEXT OF HIV AND AIDS: A VISUAL PARTICIPATORY APPROACH

Promoter: Prof N De Lange

MAHADEV, Rekha

Title of Thesis:

INDIAN SECONDARY SCHOOL YOUTHS' UNDERSTANDING OF SEXUAL VIOLENCE IN THEIR COMMUNITY IN THE AGE OF HIV AND AIDS: A PARTICIPATORY VIDEO APPROACH

Promoter: Prof N De Lange

MNISI, Thoko Esther

Title of Thesis:

DIGITAL STORY TELLING TO EXPLORE HIV- AND AIDS-RELATED STIGMA WITH SECONDARY SCHOOL LEARNERS IN A RURAL COMMUNITY IN KWAZULU-NATAL

Promoter: Prof N De Lange

MUSINGARABWI, Starlin

Title of Thesis:

UNDERSTANDING CURRENT TEACHER IMPLEMENTATION OF ZIMBABWE'S PRIMARY SCHOOL AIDS CURRICULUM: A CASE STUDY

Promoter: Prof SE Blignaut

SEKIWU, Denis

Title of Thesis:

INTEGRATION OF VALUES INTO MANAGEMENT OF LEARNERS' DISCIPLINE IN UGANDAN SCHOOLS

Promoter: Prof MM Botha

TWALO, Thembinkosi Gladden

Title of Thesis:

APPROPRIATENESS OF MUNICIPAL WORKERS' JOB BEHAVIOUR AND PERFORMANCE IN THE BUFFALO CITY METROPOLITAN MUNICIPALITY

Promoter: Prof P Singh

■ Faculty of Engineering, the Built Environment and IT

DOCTOR OF PHILOSOPHY IN CONSTRUCTION MANAGEMENT

ADENDORFF, Gillian Lorraine

Title of Thesis:

POSSIBLE FUTURES FOR THE AFRICAN BUILT ENVIRONMENT TOWARDS 2050

Promoter: Prof JJ Smallwood

FROISE, Timothy

Title of Thesis:

BUILDING INFORMATION MODELLING AS A CATALYST FOR AN INTEGRATED CONSTRUCTION PROJECT DELIVERY CULTURE IN SOUTH AFRICA

Promoter: Prof WMW Shakantu

GOLDSWAIN, Craig Colin

Title of Thesis:

ARCHITECTURAL DESIGN INTERVENTIONS TOWARD IMPROVEMENT OF CONSTRUCTION HEALTH, SAFETY AND ERGONOMICS IN SOUTH AFRICA

Promoter: Prof JJ Smallwood

OKORIE, Nnannaya Victor

Title of Thesis:

BEHAVIOUR-BASED HEALTH AND SAFETY MANAGEMENT IN CONSTRUCTION: A LEADERSHIP-FOCUSED APPROACH

Promoters: Prof JJ Van Wyk and Prof JJ Smallwood

Co-Promoter: Dr FA Emuze

DOCTOR OF PHILOSOPHY

JOHL, Christian Peter

(Information Technology)

Title of Thesis:

A VALUE FRAMEWORK FOR INFORMATION AND COMMUNICATION TECHNOLOGY GOVERNANCE IN SOUTH AFRICAN HIGHER EDUCATION INSTITUTIONS

Promoter: Prof R Von Solms

Co-Promoter: Prof SV Flowerday

MASHAPA, Job

(Information Technology)

Title of Thesis:

A MODEL FOR MANAGING USER EXPERIENCE

Promoter: Prof D Van Greunen

OUMA, Stella

(Information Technology)

Title of Thesis:

AN M-HEALTH USER EXPERIENCE FRAMEWORK FOR THE PUBLIC HEALTH CARE SECTOR

Promoter: Prof D Van Greunen

Co-Promoter: Prof ME Herselman

VAN DE HAAR, Helen Augusta

(Information Technology)

Title of Thesis:

A FRAMEWORK FOR BIOMETRICS FOR SOCIAL GRANTS IN SOUTH AFRICA

Promoter: Prof D Van Greunen

Co-Promoter: Prof D Pottas

WILLETT, Melanie

(Information Technology)

Title of Thesis:

A FRAMEWORK FOR ASSURING THE CONFORMANCE OF CLOUD-BASED EMAIL AT HIGHER EDUCATION INSTITUTIONS

Promoter: Prof R Von Solms

DOCTOR OF PHILOSOPHY IN ENGINEERING**BULBRING, Daniel Louis Hans**

(Mechanical)

Title of Thesis:

CHARACTERIZATION OF FRICTION HYDRO PILLAR PROCESS WELD PROPERTIES AS APPLIED TO 10CrMo910 CREEP RESISTANT STEEL FOR APPLICATION IN THE POWER GENERATION INDUSTRY

Promoter: Prof DG Hattingh

Co-Promoter: Dr A Els-Botes

MJALI, Kadephi Vuyolwethu

(Mechanical)

Title of Thesis:

LASER BENDING OF COMMERCIAL LYPURE GRADE 2 TITANIUM ALLOY PLATES: MECHANISMS, ANALYSIS AND CHARACTERISATION OF MECHANICAL PROPERTIES

Promoter: Prof P McGrath

SAMUEL, Darren Alton Graham

(Mechanical)

Title of Thesis:

STUDY OF THE INTERRELATIONSHIP BETWEEN WELD GEOMETRY, PROCESS VARIABLES AND JOINT INTEGRITY FOR FRICTION PROCESSED AA6082-T6 ALUMINIUM

Promoter: Prof DG Hattingh

Co-Promoter: Dr A Els-Botes

Faculty of Health Sciences**DOCTOR OF PHILOSOPHY****CONNELLY, Ruth Ellen**

(Psychology)

Title of Thesis:

THE REDEMPITIVE LIFE STORY OF GLENDA WATSON-KAHLENBERG: A PSYCHO BIOGRAPHICAL STUDY

Promoter :Prof L-A Stroud

Co-Promoter: Prof JG Howcroft

JORDAAN, Hendrina Jacoba

(Psychology)

Title of Thesis:

SELF-ESTEEM, COPING AND THE PSYCHOLOGY OF INFERTILITY

Promoter: Prof L-A Stroud

KEELE, Mbali Zamathiyane

(General Health Sciences)

Title of Thesis:

DEVELOPMENT OF A BULB INEFRUTESCENS AND CARPOBROTUSEDULIS CREAM IN COLLABORATION WITH AFRICAN TRADITIONAL HEALERS OF THE NELSON MANDELA METROPOLE

Promoter: Prof M Van De Venter

Co-Supervisors: Prof PJ Milne and Prof G Kilian

SOJI, Zoleka

(Social Development Professions)

Title of Thesis:

PRACTICE GUIDELINES FOR SUPPORTING YOUTH-HEADED FAMILIES TO ENHANCE THEIR RESILIENCE

Promoter: Dr BML Pretorius

Co-Promoter: Prof M Bak

DOCTOR OF PHILOSOPHY IN NURSING**DURAND, Sussara Maria**

Title of Thesis:

OPTIMIZING THE EXPERIENCES OF SHORT TERM STUDY ABROAD NURSING STUDENTS AT A HIGHER EDUCATION INSTITUTION

Promoter: Prof RM Van Rooyen

Co-Promoters: Dr BML Pretorius and Prof L Uys

FROOD, Sharron Louise

Title of Thesis:

STRATEGIES TO PROVIDE CARE AND SUPPORT TO CHILDREN WHO ARE AIDS ORPHANS LIVING IN TOWNSHIP COMMUNITIES

Promoter: Prof RM Van Rooyen

Co-Promoter: Prof EJ Ricks

JARDIEN-BABOO, Sihaam

Title of Thesis:

A BEST PRACTICE GUIDELINE FOR PATIENT-CENTRED CARE IN PUBLIC HOSPITALS IN NELSON MANDELA BAY

Promoter: Prof RM Van Rooyen

Co-Promoters: Prof EJ Ricks and Dr PJ Jordan

■ Faculty of Law

DOCTOR OF LAWS

BOTMA-KLEU, Carli Helena

(Mercantile Law)

Title of Thesis:

THE ROLE OF REASONABLENESS IN THE REVIEW OF CCMA ARBITRATION AWARDS IN SOUTH AFRICA: AN ENGLISH LAW COMPARISON

Promoter: Prof A Govindjee

Co-Promoters: Mr E Van Der Berg and Prof C Forsyth

CHETTY, Kasturi

(Public Law)

Title of Thesis:

THE INTERACTION OF CHILDREN'S RIGHTS, EDUCATION RIGHTS AND FREEDOM OF RELIGION IN SOUTH AFRICAN SCHOOLS

Promoter: Prof A Govindjee

Co-Promoter: Prof PHG Vrancken

HORNIGOLD, Angus Lloyd

(Public Law)

Title of Thesis:

PRINCIPLES OF SOUTH AFRICAN PRISON LAW AND PROPOSALS FOR THEIR IMPLEMENTATION

Promoter: Prof D Erasmus

Co-Promoter: Dr JC Von Bonde

■ Faculty of Science

DOCTOR OF PHILOSOPHY

BARASA, Bernard

(Environmental Geography)

Title of Thesis:

MODELLING THE HYDROLOGICAL RESPONSES TO CHANGES IN LAND USE AND COVER IN MALABA RIVER CATCHMENT, EASTERN UGANDA

Promoter: Prof V Kakembo

FREDERICKS, Ernst Samuel

(Biochemistry)

Title of Thesis:

MOLECULAR SIGNAL IN GINERLY COLORECTAL CARCINO GENESIS: THE ROLES AND RELATIONSHIP SOFβ- CATENIN, PPARγ AND COX-2

Promoter: Prof S Roux

Co-Promoter: Dr G Dealtry

HUMAN, Lucienne Ryno Daniel

(Botany)

Title of Thesis:

THE CONTRIBUTION OF SUBMERGED MACRO PHYTES AND MACRO ALGAE TO NUTRIENT CYCLING IN THE GREAT BRAK ESTUARY

Promoter: Dr GC Snow

Co-Promoter: Prof JB Adams and Prof GC Bate

JANSE VAN VUUREN, Arno

(Physics)

Title of Thesis:

SWIFT HEAVY ION RADIATION DAMAGE IN NANO CRYSTALLINE Zn

Promoter: Prof JH Neethling

Co-Promoter: Dr JH O'Connell

MIYA, Senzo Simo

(Physics)

Title of Thesis:

ATMOSPHERIC PRESSURE METAL-ORGANIC VAPOUR PHASE EPITAXIAL GROWTH OF InAs/GaSb STRAINED LAYER SUPER LATTICES

Promoter: Prof JR Botha

Co-Promoter: Dr V Wagener

MOGAE, Kabelo

(Mathematics)

Title of Thesis:

PRIMENESS IN NEAR-RINGS OF CONTINUOUS MAPS

Promoter: Prof GL Booth

Co-Promoter: Prof JH Meyer

MURAPE, Davison Munyaradzi

(Physics)

Title of Thesis:

ON THE ELECTRICAL CHARACTERISATION OF BULK AND EPITAXIAL n-TYPE Te-OPED GaSb

Promoter: Prof A Venter

Co-Promoter: Prof JR Botha

NASILA, Mark Wopicho

(Mathematical Statistics)

Title of Thesis:

STATISTICAL MODELLING FOR DETECTION OF FRAUDULENT ACTIVITY ON BANKING CARDS

Promoter: Prof GD Sharp

NAUDÉ, Kevin Alexander

(Computer Science)

Title of Thesis:

A METHOD FOR THE EVALUATION OF SIMILARITY MEASURES ON GRAPHS AND NETWORK-STRUCTURED DATA

Promoter: Prof JH Greyling

Co-Promoter: Dr D Vogts

NTAWANGA, Felix Fred

(Computer Science)

Title of Thesis:

A CONTEXT-AWARE MODEL TO IMPROVE USABILITY OF INFORMATION PRESENTED ON MOBILE DEVICES

Promoter: Prof AP Calitz

Co-Promoter: Dr L Barnard

OGUNLEYE, Christopher Olarinde

(Textile Science)

Title of Thesis:

HIGH PERFORMANCE NONWOVENS IN TECHNICAL TEXTILE APPLICATIONS

Promoter: Prof RD Anandjiwala

Co-Promoter: Prof L Hunter

PATRICK, Paula

(Zoology)

Title of Thesis:

ASSEMBLAGE DYNAMICS OF LARVAL FISHES ASSOCIATED WITH VARIOUS SHALLOW WATER NURSERY HABITATS IN ALGOA BAY, SOUTH AFRICA

Promoter: Dr N Strydom

TSHIDINO, Shonisani Cathphonia

(Biochemistry)

Title of Thesis:

EFFICACY OF TWO MEDICINAL PLANT EXTRACTS AND METFORMIN IN THE PREVENTION OF DIET INDUCED FATTY LIVER

Promoter: Prof S Roux

Co-Promoter: Dr T Koekemoer

VENABLES, Luanne

(Biochemistry)

Title of Thesis:

INVITRO INDUCTION OF CELL DEATH PATHWAYS BY ARTEMISIAAFRA EXTRACT AND ISOLATION OF AN ACTIVE COMPOUND, ISOALANTOLACTONE

Promoter: Prof M Van De Venter

Co-Promoter: Dr ED Goosen

VENTER, Daniel Jacobus Lodewyk

(Mathematical Statistics)

Title of Thesis:

THE CONSOLIDATION OF FORECASTS WITH REGRESSION MODELS

Promoter: Prof I N Litvine

VON MALTITZ, Graham Paul

(Botany)

Title of Thesis:

BIO-FUEL, LAND USE TRADE-OFFS AND LIVELIHOODS IN SOUTHERN AFRICA

Promoter: Prof C Fabricius

ZENGNI, Rebecca

(Environmental Geography)

Title of Thesis:

ASSESSING SOIL CARBON AND CARBON DIOXIDE FLUXES UNDER DIFFERENT VEGETATION COVER CONDITIONS IN THE EASTERN CAPE PROVINCE, SOUTH AFRICA

Promoter: Prof V Kakembo

DOCTOR OF TECHNOLOGY: AGRICULTURE**PITTAWAY, Timothy Michael**

Title of Thesis:

EXPLORING INTERVENTIONS FOR PARTICIPATION OF EMERGING FARMERS IN THE EASTERN CAPE OSTRICH-INDUSTRY SUPPLY CHAIN

Promoter: Prof P Van Niekerk

Co-Promoter: Dr JLM Vansteenkist

Research Masters

■ Faculty of Arts

MASTER OF ARTS

ABRAHAMS, Andre John

(Political Studies)

Title of Dissertation:

POLITICAL AND RELIGIOUS IDENTITIES: AN EXPLORATION OF CHANGING IDENTITIES AMONGST RELIGIOUS LEADERS IN THE NORTHERN AREAS OF PORT ELIZABETH

Supervisor: Prof W Isaacs-Martin

BLIGNAUT, David Llewellyn

(Applied Language Studies)

Title of Dissertation:

AN ETHNO-GRAPHIC STUDY OF BUSINESS DOCUMENTATION WRITING PRACTICES OF SELECTED HUMAN RESOURCE PRACTITIONERS IN THE NELSON MANDELA METROPOLE

Supervisor: Dr M Harran

DROTT, Eva Helene

(Political Studies)

Title of Dissertation:

THE EVOLUTION OF RESPONSIBILITY TO PROTECT PRINCIPLE ON THE AFRICAN CONTINENT: THE CASE OF LIBYA AND MALI

Supervisor: Dr J Steyn-Kotzé

DU PREEZ, Jenny Bozena

(Public Administration)

Title of Dissertation:

RE-IMAGINING LOVE AND INTIMACY IN THE POETRY OF GALEBA BADEROON, INGRID DE KOK AND MAKHOSAZANA XABA

Supervisor: Prof ME West

FRYER, Jocelyn Teri – CUM LAUDE

(English)

Title of Dissertation:

ALTERING URBAN SCAPES: SOUTH AFRICAN WRITERS RE-IMAGINING JOHANNESBURG, WITH SPECIFIC REFERENCE TO LAUREN BEUKES, K. SELLO DUKER, NADINE GORDIMER AND PHASWANE MPE

Supervisor: Prof ME West

JAKOET, Amina – CUM LAUDE

(Public Administration)

Title of Dissertation:

AN ASSESSMENT OF THE NELSON MANDELA BAY MUNICIPALITY'S LOCAL GOVERNMENT TURNAROUND STRATEGY: A GOVERNANCE PERSPECTIVE

Supervisor: Prof JD Taylor

JAXA, Nontembiso Patricia – CUM LAUDE

(isiXhosa)

Title of Dissertation:

UPHONONONGO NGOKWESITHAKOSOBUNZULULWAZI-SAKHONOKWIINOVELI EZIMBINIZESIXHOSA: UKHOZI OLUMAPHIKOKUNYENOLWADILIK'UDONGA (A STYLISTIC REFLECTION ON TWO ISIXHOSA NOVELS: UKHOZI OLUMAPHIKO AND LWADILIK'UDONGA)

Supervisor: Prof N Saule

Co-Supervisor: Dr L Kwatsha

LÖTTER, Casper – CUM LAUDE

(Philosophy)

PLACES TO LOOK FOR M/OTHER – HETERODOX DISCOURSE ON GENDER AMONG CONTEMPORARY CHINESE WOMEN: A CROSS CULTURAL FEMINIST APPROACH

Supervisor: Prof B Olivier

NCUKANA, Litha

(Public Administration)

Title of Dissertation:

THE ASSESSMENT OF THE SKILLS DEVELOPMENT TRAINING PROGRAMMES ON THE PERFORMANCE OF EDUCATORS: THE CASE OF SELECTED SCHOOLS IN KING WILLIAM'S TOWN

Supervisor: Dr S Maclean

PINNOCK, William Keith

(English)

Title of Dissertation:

"TO LEARN HOW TO SPEAK": A STUDY OF JEREMY CRONIN'S POETRY

Supervisor: Prof ME West

POGGI, Giovanni Corrado

(Political Studies)

Title of Dissertation:

IDENTITY, NATIONALISM AND SUCCESSFUL GOVERNANCE IN AFRICA: THE SECESSION OF SOUTH SUDAN

Supervisor: Dr J Steyn-Kotzé

ROBOJI, Zukiswa

(Public Administration)

Title of Dissertation:

FACTORS INFLUENCING REPORTS ON ANTI-RETROVIRAL THERAPY SITES, AT AMATHOLE HEALTH DISTRICT

Supervisor: Prof RS Masango

SPIES, Dalet

(Afrikaans and Dutch)

Title of Dissertation:

AN ANALYSIS OF THE REPRESENTATION OF THE CIRCUS IN THREE TEXTS (PART 1); SHORT FILM SCRIPT (PART 2) - DANCE ON THE RUBBISH DUMP

Supervisor: Dr ML Crous

Co-Supervisor: Ms JL Vermaak

TSOKO, Lulekwa Nokuzola – CUM LAUDE

(Public Administration)

Title of Dissertation:

THE ROLE OF TRADITIONAL LEADERS IN COMMUNITY DEVELOPMENT: THE CASE OF MBASHE MUNICIPALITY

Supervisor: Dr S Maclean

MASTER OF ARTS IN MEDIA STUDIES**GODFREY, Lianne – CUM LAUDE**

Title of Dissertation:

INVESTIGATING MODERNISATION IN IRAN IN RELATION TO THE CHANGING FIFTH NEWS FILTER OF HERMAN AND CHOMSKY'S 'PROPAG AND A MODEL'

Supervisor: Prof A Konik

MASTER OF TECHNOLOGY: FASHION**VAN DER LINDEN, Cedric Alain Denis**

Title of Dissertation:

GOING BEYOND ILLUSTRATION OF THE LOVE CRAFT NOVEL "AT THE MOUNTAINS OF MADNESS"

Supervisor: Mr DA Jones

■ Faculty of Business and Economic Sciences**MASTER OF ARTS IN ECONOMICS****NYIRANSHUTI, Claudette – CUM LAUDE**

Title of Dissertation:

MONETARY POLICY TRANSMISSION MECHANISM IN RWANDA: A REVIEW OF THE BANK LENDING CHANNEL POST 1994

Supervisor: Prof MK Ocran

MASTER OF COMMERCE**FERNANDES, Gladys Nicola**

(Economics)

Title of Dissertation:

THE EFFECT OF THE NELSON MANDELA BAY STADIUM ON SURROUNDING HOUSE PRICES: A HEDONIC ANALYSIS

Supervisor: Prof M Du Preez

Co-Supervisor: Mr MC Sale

KHOBAL, Hlalefang Benedict

(Economics)

Title of Dissertation:

THE RELATIONSHIP BETWEEN ELECTRICITY SUPPLY, POWER OUTAGES AND ECONOMIC GROWTH IN SOUTH AFRICA

Supervisor: Prof P Le Roux

NDLOVU, Constance Vanessa

(Economics)

Title of Dissertation:

THE IMPACT OF ELECTRICITY SUPPLY ON ECONOMIC GROWTH IN SOUTH AFRICA / STATISTICAL MODELS OF CAUSALITY IN ENERGY MARKETS OF SOUTH AFRICA

Supervisor: Prof P Le Roux

Co-Supervisor: Prof IN Litvine

ANTONI, Xolile Lucas

(Business Management)

Title of Dissertation:

FINANCIAL LITERACY AND BEHAVIOUR AMONG THE BLACK COMMUNITY IN NELSON MANDELA BAY

Supervisor: Prof C Rootman

DIPPENAAR, Hendrik Johannes

(Business Management)

Title of Dissertation:

FACTORS INFLUENCING CUSTOMER RETENTION IN THE FINANCIAL PLANNING INDUSTRY

Supervisor: Prof C Rootman

Co-Supervisor: Mrs N Oosthuizen

DUCIE, Gregory Justin – CUM LAUDE

(Business Management)

Title of Dissertation:

FINANCIAL VIABILITY OF SUSTAINABLE INFRASTRUCTURAL DEVELOPMENT AT THE NELSON MANDELA METROPOLITAN UNIVERSITY

Supervisor: Prof FW Struwig

GOLIATH, Jasmine Estonia – CUM LAUDE

(Business Management)

Title of Dissertation:

ESTABLISHING THE PERCEPTIONS OF AN ENTREPRENEUR USING WORD ASSOCIATIONS

Supervisor: Prof SM Farrington

LAMA NDAI, Arnaud

(Business Management)

Title of Dissertation:

THE INFLUENCE OF ORGANIZATIONAL CULTURE ON THE HAPPINESS OF EMPLOYEES IN THE ICT INDUSTRY

Supervisor: Prof E Venter

Co-Supervisor: Prof AP Calitz

MAMOUDOU, Hamadou – CUM LAUDE

(Business Management)

Title of Dissertation:

THE INFLUENCE OF STUDENTS' PERCEIVED HAPPINESS ON THEIR ENTREPRENEURIAL INTENTION AT A HIGHER EDUCATIONAL INSTITUTION IN SOUTH AFRICA

Supervisor: Prof E Venter

Co-Supervisor: Dr MDM Cullen

MAY, Jodé Joy – CUM LAUDE

(Business Management)

Title of Dissertation:

ENVIRONMENTAL SUSTAINABILITY LEADERSHIP IN SOUTH AFRICA: AN EMPIRICAL PERSPECTIVE

Supervisor: Prof S Perks

PALFRAMAN, Jaqueline Birgitta

(Business Management)

Title of Dissertation:

EDUCATIONAL NEEDS OF THE FINANCIAL PLANNING INDUSTRY

Supervisor: Prof JK Bosch

SCHOLTZ, Reynardt – CUM LAUDE

(Business Management)

Title of Dissertation:

SOCIAL MEDIA TOOLS INFLUENCING CUSTOMER PURCHASING BEHAVIOUR IN THE RETAIL ENVIRONMENT

Supervisor: Prof C Rootman

MASTER OF ARTS**GIESSER, Anne**

(Industrial and Organisational Psychology)

Title of Dissertation:

A COMPARISON OF EXTRINSIC AND INTRINSIC MOTIVATORS BETWEEN GERMANY AND SOUTH AFRICA

Supervisor: Prof RJ Snelgar

Co-Supervisor: Dr GJ Louw

MASTER OF TECHNOLOGY: BUSINESS ADMINISTRATION**JANSEN VAN RENSBURG, Charmaine**

Title of Dissertation:

ONLINE MARKETING OF COMMERCIAL AND INDUSTRIAL PROPERTIES AND SERVICES IN A SMALL BUSINESS

Supervisor: Prof FW Struwig

SEITSHIRO, Tshidiso

Title of Dissertation:

A STUDY TO DETERMINE THE MOTIVATIONAL CLIMATE IN THE DEPARTMENT OF HEALTH

Supervisor: Prof N Kemp

MASTER OF TECHNOLOGY: MARKETING**SWIEGELAAR, Carlo**

Title of Dissertation:

THE INFLUENCE OF MEMBERS' PERCEPTIONS OF THE SMART SHOPPER LOYALTY PROGRAMME ON THEIR LOYALTY TO THE PICK 'N PAY FAMILY STORE IN GEORGE

Supervisor: Prof L Radder

Co-Supervisor: Dr M Van Eyk

MASTER OF TECHNOLOGY: HUMAN RESOURCES MANAGEMENT**DE VILLIERS, Bridget Marie – CUM LAUDE**

Title of Dissertation:

THE INFLUENCE OF STUDENT ENGAGEMENT ON THE ACADEMIC SUCCESS OF FIRST-YEAR HUMAN RESOURCE MANAGEMENT DIPLOMA STUDENTS

Supervisor: Dr A Werner

Co-Supervisor: Dr OR Ngalo

Faculty of Education**MASTER OF EDUCATION****BESE, Samuel**

Title of Dissertation:

A DEQUACY OF EMOTIONAL INTELLIGENCE SELF-MOTIVATION TO ENHANCE GRADE 12 LEARNERS' ACADEMIC PERFORMANCE

Supervisor: Dr CM Dali

BREY, Amina – CUM LAUDE

Title of Dissertation:

MULTIPLE REPRESENTATIONS AND COGNITIVE LOAD: WORDS, ARROWS AND COLOURS WHEN SOLVING ALGEBRAIC PROBLEMS

Supervisor: Prof P Webb

CAIN, Rashida

Title of Dissertation:

A CASE STUDY OF THE HIGH STUDENT FAILURE AND DROPOUT RATES AT A FET COLLEGE

Supervisor: Dr CAG Jordaan

Co-Supervisor: Mr N Rudman

DEMONK, Ingrid Venessia

Title of Dissertation:

TURNING THE LENS ON ADOLESCENT SUICIDE

Supervisor: Dr CAG Jordaan

FORBES, Carine Madge Sybil

Title of Dissertation:

EMPOWERING EDUCATORS TO DEAL WITH CHALLENGING BEHAVIOUR AT HIGH SCHOOLS IN POOR SOCIO- ECONOMIC AREAS

Supervisor: Dr AJ Greyling

KLITSIE, Clara Cornelia – CUM LAUDE

Title of Dissertation:

TEACHER CONVERSATIONS: WHAT HAPPENS WHEN TEACHERS TALK

Supervisor: Dr J McFarlane

MALATALIANA, Phaello Olivia

Title of Dissertation:

THE LINK BETWEEN INTERCULTURAL DIFFERENCES AND AN OPTIMAL TEACHING AND LEARNING ENVIRONMENT IN A MASERU SCHOOL

Supervisor: Prof MM Botha

PILLAI, Saloshni

Title of Dissertation:

TEACHERS' AND LEARNERS' EXPERIENCES AND PERCEPTIONS CONCERNING THE USE OF ENGLISH AS A LANGUAGE OF LEARNING AND TEACHING IN BI/MULTILINGUAL MATHEMATICAL LITERACY CLASSROOMS

Supervisor: Dr L Webb

RAJOO, Neeranjini – CUM LAUDE

Title of Dissertation:

FROM HUMAN TO HUMAN(E): AN EDUCATOR'S REFLEXIVE NARRATIVE JOURNEYING

Supervisor: Prof DM Swanson

SUBRAMANIAN, Brenda Berenice – CUM LAUDE

Title of Dissertation:

EXPLORING TEACHERS' PERCEPTIONS OF THE BARRIERS AND SOLUTIONS TO USING ONE TEACHER LAPTOP PER CLASS IN A MULTI-GRADE CONTEXT: THE CASE OF INTEL TEACH-ICT IMPLEMENTATION

Supervisor: Dr A Du Plessis

TERBLANCHE, Malise Georgette

Title of Dissertation:

THE INFLUENCE OF THE EXTENDED FAMILY ON THE SOCIAL AND MORAL DEVELOPMENT OF THE CHILD IN THE SINGLE PARENT FAMILY

Supervisor: Dr AJ Greyling

THORNE, Rochelle Eugenia

Title of Dissertation:

CONTENT AND LANGUAGE INTEGRATED LEARNING (CLIL) AS A LANGUAGE SUPPORT STRATEGY IN A GRADE 8 NATURAL SCIENCES CLASSROOM

Supervisor: Dr K Adam

VAN NIEKERK, Chantelle Emirina – CUM LAUDE

Title of Dissertation:

THE EFFECTIVE ESTABLISHMENT AND FUNCTIONING OF THE INSTITUTIONAL LEVEL SUPPORT TEAM AT PRIMARY SCHOOLS IN THE UITENHAGE DISTRICT

Supervisor: Dr CF Pienaar

VERMONTI, Stefano – CUM LAUDE

Title of Dissertation:

A PHENOMENOLOGICAL EXPLORATION: HOW SECONDARY SCHOOL TEACHERS COPE WITH DEPRESSED ADOLESCENTS IN THEIR CLASSROOMS

Supervisor: Dr CF Pienaar

ZAKUMBA, Lwazi Xolisile

Title of Dissertation:

A CASE STUDY OF THE ROLE OF EXCEL AS A TEACHING AND LEARNING TOOL IN INFLUENCING LEARNERS' INTERPRETATION OF FUNCTIONS

Supervisor: Dr L Webb

■ Faculty of Engineering, the Built Environment and IT

MASTER OF SCIENCE IN CONSTRUCTION MANAGEMENT

KADANGWE, Samuel Ronald – CUM LAUDE

Title of Dissertation:

THE RELATIONSHIP BETWEEN THE VALUE CHAIN AND PROJECT SUCCESS IN THE MALAWIAN CONSTRUCTION INDUSTRY

Supervisor: Prof JJ Smallwood

Co-Supervisor: Dr FA Emuze

MASTER OF TECHNOLOGY: CONSTRUCTION MANAGEMENT

SMIT, Gerrit – CUM LAUDE

Title of Dissertation:

GREEN BUILDING GUIDELINES AT NELSON MANDELA METROPOLITAN UNIVERSITY

Supervisor: Prof JJ Van Wyk

Co-Supervisor: Prof FW Struwig

MASTER OF TECHNOLOGY: INFORMATION TECHNOLOGY

DANIELL, Janine

Title of Dissertation:

FACTORS IMPACTING THE INTRODUCTION OF INFORMATION TECHNOLOGY USAGE IN NETBALL COACHING

Supervisor: Ms KA Church

Co-Supervisor: Prof D van Greunen

KATIVU, Kevin Tatenda

Title of Dissertation:

GUIDELINES FOR THE EFFECTIVE USE OF TELEMEDICINE IN PUBLIC HEALTHCARE IN RESOURCE CONSTRAINED SETTINGS

Supervisor: Prof D Pottas

KORTJAN, Noluxolo – CUM LAUDE

Title of Dissertation:

A CYBER SECURITY AWARENESS AND EDUCATION FRAMEWORK FOR SOUTH AFRICA

Supervisor: Prof R Von Solms

MARAIS, Craig

Title of Dissertation:

GUIDELINES FOR THE USE OF THE IN DIE APPROACHING AME DEVELOPMENT PROJECTS IN THE CONTEXT OF A CAPSTONE EXPERIENCE

Supervisor: Dr L Fletcher

Co-Supervisor: Prof JF van Niekerk

MEIRING, Natalie Anne

Title of Dissertation:

FACTORS IMPACTING TABLET PC USAGE IN LOW-INCOME COMMUNITIES

Supervisor: Prof D van Greunen

VAN STAM, Gert Jan – CUM LAUDE

Title of Dissertation:

A STRATEGY TO MAKE ICT ACCESSIBLE IN RURAL ZAMBIA: A CASE STUDY OF MACHA

Supervisor: Prof D van Greunen

MASTER OF ENGINEERING IN MECHATRONICS**BEZUIDENHOUT, Sarel Willem Johannes**

Title of Dissertation:

AN ANDROID AND VISUAL C-BASED CONTROLLER FOR A DELTA PARALLEL ROBOT TO USE AS A CLASSROOM TRAINING TOOL

Supervisor: Prof TI Van Niekerk

KLÖBLEN, Arne Holger

Title of Dissertation:

CONSTRUCTION AND INTEGRATION OF A BATTERY PACK AND MANAGEMENT SYSTEM INTO A SOLAR CAR

Supervisor: Prof TI Van Niekerk

NÖRTEMANN, Alexander – CUM LAUDE

Title of Dissertation:

DEVELOPMENT OF A MECHATRONIC TRANSMISSION CONTROL SYSTEM FOR THE DRIVE TRAIN OF THE K71 PROJECT

Supervisor: Prof U Becker

Co-Supervisor: Prof TI Van Niekerk

NÖRTEMANN, Markus – CUM LAUDE

Title of Dissertation:

CHARACTERISATION OF YOUNG'S MODULUS AND LOSS FACTOR OF DAMPING MATERIALS

Supervisor: Prof U Becker

Co-Supervisor: Prof TI Van Niekerk

POOLE, Sean Nicholas – CUM LAUDE

Title of Dissertation:

THE DEVELOPMENT OF A SEGMENTED VARIABLE PITCH SMALL HORIZONTAL AXIS WIND TURBINE WITH ACTIVE PITCH CONTROL

Supervisor: Dr RL Phillips

Co-Supervisor: Prof TI Van Niekerk

ROBERTS, Bryndan Hugh

Title of Dissertation:

INTEGRATION OF AN ELECTRICAL DISCHARGE MACHINING MODULE ONTO A RECONFIGURABLE MACHINE TOOL

Supervisor: Prof IA Gorchach

Co-Supervisor: Prof TI Van Niekerk

VAN DEN BERG, Allan Edward

Title of Dissertation:

HARDWARE EVOLUTION OF A DIGITAL CIRCUIT USING A CUSTOM VLSI ARCHITECTURE

Supervisor: Dr F Smith

MASTER OF TECHNOLOGY: ENGINEERING: ELECTRICAL**CUMBERLEGE, Aidan Charles**

Title of Dissertation:

WIRELESS MOBILE ANDROID TECHNOLOGY IN THE MONITORING AND CONTROL OF A SAFETY INTEGRATED ROBOTIC CELL

Supervisor: Prof TI Van Niekerk

Co-Supervisor: Mr GV Phillips

MINKLEY, Warick

Title of Dissertation:

ANALYSIS OF A RESTRICTED EARTH FAULT RELAY APPLICATION WITHIN A SHUNT CAPACITOR BANK DESIGN IMPACTING ON PROTECTION STABILITY

Supervisor: Dr W Phipps

Co-Supervisor: Dr RT Harris

TABERER, Marcel Wayne

Title of Dissertation:

TRANSIENT ANALYSIS OF ERRONEOUS TRIPPING AT GRASSRIDGE STATIC VAR COMPENSATOR

Supervisor: Mr AG Roberts

Co-Supervisor: Dr RT Harris

MASTER OF TECHNOLOGY: ENGINEERING: MECHANICAL**MAIDADI, Mohaman Bello – CUM LAUDE**

Title of Dissertation:

PACKED BED-ROCK THERMAL STORAGE FOR CONCENTRATED SOLAR POWER: ENHANCEMENT OF STORAGE TIME AND EFFICIENCY

Supervisor: Dr RL Phillips

Co-Supervisor: Prof H Lombard

OPPERMAN, Adriaan Jacobus

Title of Dissertation:

ANALYSIS OF FACTORS INFLUENCING THE PERFORMANCE OF A HYDROKINETIC ENERGY HARVESTER

Supervisor: Dr RL Phillips

Co-Supervisor: Prof DG Hattingh

Faculty of Health Sciences**MASTER OF ARTS****CHETTY, Candice Taryn**

(Psychology)

Title of Dissertation:

STORYING THE CAREER DEVELOPMENT OF BLACK SOUTH AFRICAN FEMALE UNIVERSITY STUDENTS

Supervisor: Prof MB Watson

Co-Supervisors: Dr M McMahon and Prof CN Hoelson

KAHTS, Samantha Andrea – CUM LAUDE

(Human Movement Science)

Title of Dissertation:

FUNDAMENTAL MOVEMENT SKILL PROFICIENCY STATUS OF GIRLS AGED 9-TO-12 YEARS FROM PREVIOUSLY DISADVANTAGED COMMUNITIES IN NELSON MANDELA BAY

Supervisor: Prof R Du Randt

KOCK, Sue-Anne Claire

(Human Movement Science)

Title of Dissertation:

PHYSICAL ACTIVITY AND OTHER SELECTED HEALTH PROMOTING BEHAVIOURS OF UNIVERSITY STUDENTS LIVING WITH HIV

Supervisor: Dr CM Walter

Co-Supervisors: Prof R Du Randt and Prof M Harris

MCKERSIE, Joanna Mary

(Human Movement Science)

Title of Dissertation:

OBESITY PREVALENCE AND ASSOCIATED PHYSICAL ACTIVITY LEVELS OF CHILDREN AGED SEVEN TO TEN YEARS IN QUINTILE FIVE PRIMARY SCHOOLS IN THE NELSON MANDELA METROPOLITAN MUNICIPALITY

Supervisor: Dr ML Baard

MUCHENA, Kudakwashe Christopher

(Psychology)

Title of Dissertation:

DAMBUDZOMARECHERA: A PSYCHO BIOGRAPHICAL STUDY

Supervisor: Prof JG Howcroft

Co-Supervisor: Prof L-A Stroud

RAMPHOMANE, Bonolo

(Human Movement Science)

Title of Dissertation:

GAZE BEHAVIOUR OF VOLLEYBALL PLAYERS DURING SUCCESSFUL SERVE RECEPTION

Supervisor: Prof R Du Randt

Co-Supervisors: Prof DA Kluka and Mr DL Venter

MASTER OF NURSING**BENJAMIN, Valencia Beverley – CUM LAUDE**

Title of Dissertation:

EXPERIENCES OF PROFESSIONAL NURSES WITH REGARD TO ACCESSING INFORMATION AT THE POINT-OF-CARE VIA MOBILE-COMPUTING DEVICES AT A PUBLIC HOSPITAL

Supervisor: Prof EJ Ricks

Co-Supervisor: Dr M Williams

MPASA, Ferestas

Title of Dissertation:

STRATEGIES FOR THE IMPLEMENTATION OF CLINICAL PRACTICE GUIDELINES IN THE INTENSIVE CARE: A SYSTEMATIC REVIEW

Supervisor: Dr PJ Jordan

Co-Supervisor: Ms C Bowers

OPADOTUN, Olukemi Olufunmilayo

Title of Dissertation:

INFECTION-CONTROL PRACTICES FOR THE PREVENTION OF SURGICAL-SITE INFECTIONS IN THE OPERATING ROOM

Supervisor: Prof PJ Jordan

Co-Supervisor: Ms S Jardien-Baboo

WIBBELINK, Maria-Geertje

Title of Dissertation:

PERCEPTIONS OF MIDWIVES AND OBSTETRICIANS IN THE PRIVATE SECTOR REGARDING COLLABORATIVE MATERNITY CARE

Supervisor: Prof SV James

Co-supervisor: Prof EJ Ricks

MASTER OF PHARMACY**ABAHAMYE, Aloysius**

Title of Dissertation:

COST COMPARISON BETWEEN REPACKAGING BULK ORAL SOLID MEDICINES AND PURCHASING MANUFACTURER-PREPARED PATIENT-READY PACKS IN THE PUBLIC SECTOR IN SOUTH AFRICA

Supervisor: Dr SF Burton

Co-Supervisor: Ms S Putter

OIDU, Benjamin

Title of Dissertation:

INTAKE OF LIPOSOMES INTO BACTERIAL CELLS

Supervisor: Prof G Kilian

MASTER OF SCIENCE**OKAFOR, Chinedum Oluchukwu**

(General Health Sciences)

Title of Dissertation:

FORMULATION AND STABILITY TESTING OF EYE DROP PREPARATIONS CONTAINING PHENYLEPHINE HYDROCHLORIDE

Supervisor: Ms MB Keele

Co-Supervisors: Prof G Kilian and Dr M Worthington

MASTER OF TECHNOLOGY: BIOMEDICAL TECHNOLOGY**HAYES, Cindy-Lou**

Title of Dissertation:

PREVALENCE AND RESISTANCE GENEMUTATIONS OF MULTI-DRUG RESISTANT AND EXTENSIVELY DRUG RESISTANT MYCOBACTERIUM TUBERCULOSIS IN THE EASTERN CAPE

Supervisor: Dr S Govender

Co-Supervisor: Mrs E Baxter

KAMANGA, Melvin Chalochapasi – CUM LAUDE

Title of Dissertation:

BIOLOGICAL ACTIVITIES OF MEDICINAL PLANTS TRADITIONALLY USED IN THE EASTERN CAPE TO TREAT PNEUMONIA

Supervisor: Prof N Smith

NKOSI, Themba Johan

Title of Dissertation:

ANTIMICROBIAL ACTIVITIES OF THREE MEDICINAL PLANTS AGAINST SELECTED DIARRHEAGENIC PATHOGENS

Supervisor: Prof N Smith

SELEMANI, George Paul

Title of Dissertation:

GENETIC DIVERSITY AND POPULATION STRUCTURE OF PLASMODIUM FALCIPARUM FROM FOUR EPIDEMIOLOGICAL LOCATIONS IN MALAWI

Supervisor: Prof N Smith

Co-Supervisor: Dr FK Dzinjalama

■ Faculty of Law

MASTER OF LAWS

CHINGENI, Janet Chisomo

(Public Law)

Title of Dissertation:

ACCOUNTABILITY OF ARMED OPPOSITION GROUPS IN SOMALIA

Supervisor: Mr D Abrahams

VAN TONDER, Jan-Louis – CUM LAUDE

(Mercantile Law)

Title of Dissertation:

DIRECTORS' DUTIES UNDER THE COMPANIES ACT 71 OF 2008

Supervisor: Ms L Coetzee

■ Faculty of Science

MASTER OF COMMERCE

SNYMAN, Irene – CUM LAUDE

(Computer Science and Information Systems)

Title of Dissertation:

A FRAMEWORK FOR CO-LOCATED COLLABORATIVE BUSINESS PROCESS MODELLING USING TOUCH TECHNOLOGIES

Supervisor: Prof AP Calitz

Co-Supervisor: Dr BM Scholtz

TLEBERE, Thabo Eugene – CUM LAUDE

(Computer Science and Information Systems)

Title of Dissertation:

A MODEL FOR SUPPORTING ENVIRONMENTAL AWARENESS IN HIGHER EDUCATION USING SOCIAL MEDIA

Supervisor: Dr BM Scholtz

Co-Supervisor: Prof AP Calitz

VAN DER HOOGEN, Anthea Vivian – CUM LAUDE

(Computer Science and Information Systems)

Title of Dissertation:

AN ENTERPRISE ARCHITECTURE FOR ENVIRONMENTAL INFORMATION MANAGEMENT AND REPORTING

Supervisor: Prof AP Calitz

Co-Supervisor: Dr BM Scholtz

MASTER OF SCIENCE

ALNSEERAT, Nemr

(Computer Science and Information Systems)

Title of Dissertation:

AN ARCHITECTURE FOR THE EFFECTIVE USE OF MOBILE DEVICES IN SUPPORTING CONTACT LEARNING

Supervisor: Dr D Vogts

Co-Supervisor: Prof JH Greyling

BAMBALAZA, Sonwabo Elvis – CUM LAUDE

(Chemistry)

Title of Dissertation:

AN INVESTIGATION INTO THE USE OF ACERAMI FIABLE ETHYLENE VINYL ACETATE (EVA) CO-POLYMER FORMULATION TO AID FLAME RETARDENCY IN ELECTRIC CABLES

Supervisor: Prof E Ferg Co-Supervisor: Dr P Hlangothi

BARNARDO, Nadia

(Botany)

Title of Dissertation:

SUSTAINABLE HARVESTING OF WILD POPULATIONS OF CYCLOPIA INTERMEDIA IN KOUGA, EASTERN CAPE, SOUTH AFRICA

Supervisor: Prof EE Campbell Co-Supervisor: Dr AJ Potts

BEZUIDENHOUT, Lucian John-Ross

(Physics)

Title of Dissertation:

ON THE CHARACTERISATION OF PHOTOVOLTAIC DEVICE PARAMETERS USING LIGHT BEAM INDUCED CURRENT MEASUREMENTS

Supervisor: Prof E van Dyk

Co-Supervisors: Dr FJ Vorster and Dr MC Du Plessis

BURGER, Clayton

(Computer Science and Information Systems)

Title of Dissertation:

A HYBRIDISATION TECHNIQUE FOR GAME PLAYING USING THE UPPER CONFIDENCE FOR TREES ALGORITHM WITH ARTIFICIAL NEURAL NETWORKS

Supervisor: Prof CB Cilliers

Co-Supervisor: Dr MC Du Plessis

BURGER, Kirstin

(Chemistry)

Title of Dissertation:

EVALUATION OF EUCALYPTUS CITRIODORA DERIVED P-MENTHANE-3, 8-DIOL-CITRONELLA LACETALASA BIOPLASTICIZER FOR SENSITIVE APPLICATIONS

Supervisor: Dr NM Vorster

CLARK, Candyce Raine

(Chemistry)

Title of Dissertation:

POLYNUCLEAR BIOMOLECULAR-SUPPORTED RARE EARTH COORDINATION COMPOUNDS: TOWARDS A NEW GENERATION OF LANTHANIDE-BASED DRUGS

Supervisor: Dr R Betz

Co-Supervisor: Dr A Abrahams

CLARKE, Stephen

(Biochemistry)

Title of Dissertation:

LIVER STEATOSIS AND INSULIN RESISTANCE: REVERSAL BY SUTHERLANDIA FRUTESCENS

Supervisor: Dr G Dealtry

Co-Supervisor: Dr H Davids

DAYLA, Mackraj

(Textile Science)

Title of Dissertation:

ENVIRONMENTALLY FRIENDLY DYEING AND FINISHING

Supervisor: Prof L Hunter

DE KLERK, Wesley

(Zoology)

Title of Dissertation:

THE EFFECTIVENESS OF A SMALL MARINE PROTECTED AREA ON CONSERVATION OF LINEFISH: SARDINIA BAY, SOUTH AFRICA

Supervisor: Dr R Nel

Co-Supervisor: Dr M Smale

DITTA, Mohammed Ali

(Computer Science and Information Systems)

Title of Dissertation:

DESIGNING MULTI-TOUCH TABLETOP INTERACTION TECHNIQUES TO SUPPORT CO-LOCATED GROUP INFORMATION MANAGEMENT

Supervisor: Prof JL Wesson

Co-Supervisor: Dr NLO Cowley

DOBSON, Stephen Robert – CUM LAUDE

(Physics)

Title of Dissertation:

DEVELOPMENT OF POLYMER TEMPLATES FOR Zn ONANORODS

Supervisor: Prof JR Botha

Co-Supervisor: Dr ZN Urgessa

EJESIEME, Obialo Vitus

(Chemistry)

Title of Dissertation:

EVALUATING THE EFFECT OF MICROALGAE BIOMASS ON THE COMBUSTION OF COAL

Supervisor: Prof B Zeelie

Co-Supervisor: Dr NM Vorster

ELLIS, Kristen

(Botany)

Title of Dissertation:

REVISION OF ALOIAMPELOS KLOPPER & GIDEON F.Sm. (Xanthorrhoeaceae subfam. Asphodeloideae)

Supervisor: Prof EE Campbell

Co-Supervisor: Prof GF Smith

FORTUIN, Melissa Martha

(Biochemistry)

Title of Dissertation:

THE MEDICINAL PLANT SUTHERLANDIA FRUTE SCENS REGULATES GENE EXPRESSION TO REVERSE INSULIN RESISTANCE IN RATS

Supervisor: Dr G Dealtry

GEEL, Claire – CUM LAUDE

(Geology)

Title of Dissertation:

SHALEGAS CHARACTERISTICS OF PERMIAN BLACKS HALES IN THE ECCA GROUP, NEAR JANSENVILLE, EASTERN CAPE, SOUTH AFRICA

Supervisor: Prof PWK Booth

Co-Supervisor: Prof MJ De Wit

GIDDY, Julia Kathryn

(Geography)

Title of Dissertation:

CLARIFYING THE INFLUENCE OF HUMAN-ENVIRONMENT INTERACTION ON NATURE-BASED ADVENTURE TOURISM IN THE TSITSIKAMMA, SOUTH AFRICA

Supervisor: Dr NL Webb

GQUNTA, Kwanele – CUM LAUDE

(Microbiology)

Title of Dissertation:

PREVALENCE AND MOLECULAR EPIDEMIOLOGY OF EXTENDED-SPECTRUM BETA-LACTAM AS E-PRODUCING AND CARBAPENEM-RESISTANT ENTEROBACTERIACEAE, ACINETOBACTER BAUMANNII AND PSEUDOMONAS AERUGINOSA IN PORT ELIZABETH

Supervisor: Dr S Govender

GREEN, David Bruce – CUM LAUDE

(Zoology)

Title of Dissertation:

FOR AGING ECOLOGY OF CAPE GANNETS (MORUS CAPENSIS) AT BIRD ISLAND, ALGOA BAY

Supervisor: Dr PA Pistorius

Co-Supervisor: Prof P Ryan

HABARUREMA, Gratien – CUM LAUDE

(Chemistry)

Title of Dissertation:

RHENIUM (I), (III) AND (V) COMPLEXES WITH POTENTIALLY MULTI DENTATE N, O-DONOR LIGANDS

Supervisor: Prof T I A Gerber

HANDLEY, Jonathan Murray – CUM LAUDE

(Zoology)

Title of Dissertation:

*DIET AND FORAGING DISTRIBUTION OF GENTOO PENGUINS
PYGOSCELISPAPUA AT COW BAY, FALKLAND ISLANDS*

Supervisor: Dr PA Pistorius

HOLTZHAUSEN, Tresia Louisa – CUM LAUDE

(Applied Mathematics)

Title of Dissertation:

*A MATHEMATICAL INVESTIGATION OF THE EFFECTS OF SEXUAL ORIENTATION
AND HIV STATUS ON HPV TRANSMISSION AND VACCINATION*

Supervisor: Prof JW Gonsalves

Co-Supervisor: Prof JYT Mugisha

MUEDI, Thomas

(Geology)

Title of Dissertation:

*CRETACEOUS DYKES WARMS AND BRITTLEDE FORMATION STRUCTURES IN THE
UPPER CONTINENTAL CRUST FLANKING THE ATLANTIC AND INDIAN MARGINS OF
SOUTHERN AFRICA, AND THEIR RELATIONSHIP TO THE GONDWANA BREAK-UP*

Supervisor: Prof M De Wit

Co-Supervisor: Prof RO Greiling

MUKIZA, Janvier – CUM LAUDE

(Chemistry)

Title of Dissertation:

*SYNTHESIS AND CHARACTERISATION OF OXOHENIUM (V) AND
TRICARBONYLRHENIUM (I) COMPLEXES WITH BIOLOGICALLY ACTIVE N, O AND
N, S-DONOR LIGANDS*

Supervisor: Prof TIA Gerber

NDOU, Naledzani Nyahman

(Geography)

Title of Dissertation:

*RELATING VEGETATION CONDITION TO GRAZING MANAGEMENT SYSTEMS IN
THE CENTRAL KEISKAMMA CATCHMENT, EASTERN CAPE, SOUTH AFRICA*

Supervisor: Prof V Kakembo

NGORORABANGA, Jean Marie Vianney

(Chemistry)

Title of Dissertation:

*SYNTHESIS OF FLUORESCENT POLYMERS WITH PENDANT TRIAZOLE-
QUINOLINE GROUPS VIA RAFT POLYMERIZATION*

Supervisor: Dr N Mama

Co-Supervisor: Prof C McClelland

NOMBEWU, Nomatle

(Botany)

Title of Dissertation:

*THE IMPACTS OF HARVESTING CIRCUMCISION AMARYL LIDS FROM THE
EASTERN CAPE PROVINCE, SOUTH AFRICA*

Supervisor: Prof EE Campbell

SCHMIDT, Jadon

(Botany)

Title of Dissertation:

*INFLUENCE OF PREDICTED SEA LEVEL RISE ON THE SALT MARSH OF THE
SWARTKOPS, KROMME AND KNYSNA ESTUARIES*

Supervisor: Dr TG Bornman Co-supervisor: Prof JB Adams

NOTAYI, Mzwamadoda

(Physics)

Title of Dissertation:

CHARACTERIZATION OF ANIMAL FIBRES

Supervisor: Prof JAA Engelbrecht

Co-Supervisors: Prof ME Lee, Prof L Hunter and Dr AF Botha

POTTER, Cara-Paige

(Zoology)

Title of Dissertation:

*DYNAMICS OF ANCHOVY AND SARDINE IN ALGOA BAY AND THEIR INFLUENCES
ON RESPONSE VARIABLES IN TWO THREATENED AVIAN PREDATORS*

Supervisor: Dr PA Pistorius

Co-Supervisors: Dr N Strydom and Dr L Pichegru

RISHWORTH, Gavin Midgley – CUM LAUDE

(Zoology)

Title of Dissertation:

*TIME-ACTIVITY BUDGETS IN CAPE GANNETS (MORUS CAPENSIS) AT BIRD
ISLAND, ALGOA BAY*

Supervisor: Dr PA Pistorius Co-Supervisor: Prof P Ryan

SARPONG, Abeam Danso

(Mathematical Statistics)

Title of Dissertation:

*TOLERANCE INTERVALS FOR VARIANCE COMPONENT MODELS USING A
BAYESIAN SIMULATION PROCEDURE*

Supervisor: Dr J Hugo

SCHOULTZ, Xandri – CUM LAUDE

(Chemistry)

Title of Dissertation:

ISOCYANIDE COMPLEXES OF RHENIUM

Supervisor: Prof TIA Gerber

STOFFBERG, Marguerite Ester – CUM LAUDE

(Biochemistry)

Title of Dissertation:

*A COMPARATIVE STUDY OF THE COMFORT RELATED PROPERTIES OF
COMMERCIAL APPAREL FABRICS CONTAINING NATURAL AND MAN-MADE FIBRES*

Supervisor: Prof L Hunter Co-Supervisor: Dr EM Hovgaard

THWAITS, Tiffany Edan

(Zoology)

Title of Dissertation:

*DEVELOPING AN UNDERSTANDING OF THE DRIVERS OF BAT ACTIVITY
PATTERNS RELEVANT TO WIND TURBINES*

Supervisor: Prof GIH Kerley Co-Supervisor: Dr N Mzilikazi

UGIRINEMA, Vital

(Chemistry)

Title of Dissertation:

BIOSPECIATION AND ANTIDIABETIC EFFECTS OF OXIDOVANADIUM (IV) COMPLEXES

Supervisor: Prof ZR Tshentu

Co-Supervisor: Prof CL Frost

VAN VUUREN, Larry Peter

(Biochemistry)

Title of Dissertation:

IDENTIFICATION OF MEMBRANE BIOMARKERS FOR COLORECTAL CANCER USING AN IN-SILICO AND MOLECULAR APPROACH

Supervisor: Prof S Roux

Co-Supervisor: Dr M Meyer

MASTER OF TECHNOLOGY: AGRICULTURE**KHAPAYI, Musa**

Title of Dissertation:

COMMERCIALISATION OF EMERGING FARMERS IN THE EASTERN CAPE PROVINCE: IDENTIFICATION OF LIMITING FACTORS THAT INHIBIT THE PROGRESSION FROM SUBSISTENCE TO COMMERCIAL FARMING

Supervisor: Mr PR Celliers

SOLONTSI, Mhlangabezi

Title of Dissertation:

THE RESPONSE OF MAIZE TO SELECTED RATIOS OF ORGANIC AND INORGANIC FERTILISERS IN NDLAMBE LOCAL MUNICIPALITY, EASTERN CAPE

Supervisor: Mr PR Celliers

Co-Supervisor: Mr Z Mkile

MASTER OF TECHNOLOGY: CHEMISTRY**KAUFMANN, Gideon Myron**

Title of Dissertation:

HYDROTHERMAL LIQUEFACTION OF SCENEDESMUSOBLIQUUS IN A CONTINUOUS REACTOR SYSTEM

Supervisor: Dr G Dugmore

Co-Supervisor: Mr S Roberts

NZUBE, Silumko

Title of Dissertation:

THE ACCUMULATION OF HEAVY METALS IN SOIL AND VEGETABLES IRRIGATED WITH WASTE WATER EFFLUENT IN THE BUFFALO CITY REGION

Supervisor: Dr G Rubidge

George Campus**MASTER OF TECHNOLOGY: AGRICULTURE****NTEYI, Sinovuyo Mava – POST HUMOUS**

(Botany)

Title of Dissertation:

EFFECTS OF CROP ROTATION AND TILLAGE SYSTEM ON THE CONTROL OF RYEGRASS (LOLIUM MULTI FLORUMXPERENNE) IN WHEAT (TRITICUMAESTIVUM) IN THE SWARTLAND PRODUCTION AREA OF SOUTH AFRICA'S WESTERN CAPE PROVINCE

Supervisor: Prof RMB Auerbach

Co-Supervisor: Dr M Ferreira

TERBLANCHE, Stefan – CUM LAUDE

Title of Dissertation:

AN ECONOMIC ANALYSIS OF AN INTENSIVE SHEEP PRODUCTION SYSTEM ON CULTIVATED PASTURES IN SOUTH AFRICA, INCORPORATING CREEP FEEDING- AND ACCELERATED BREEDING PRACTICES

Supervisor: Mr JW Jordaan

Co-Supervisor: Prof TS Brand

MASTER OF TECHNOLOGY: NATURE CONSERVATION**FAULCONBRIDGE, Steven Craig**

Title of Dissertation:

PROPAGATING SOME COMMONLY-USED SOUTH AFRICAN MEDICINAL PLANTS WITH COMPOST AND VERMITEA

Supervisor: Prof RMB Auerbach

Co-Supervisor: Mr M Cameron

LOFTUS, Wynand Johan

Title of Dissertation:

STRATEGIC ADAPTIVE MANAGEMENT AND THE EFFICIENCY OF INVASIVE ALIEN PLANT MANAGEMENT IN SOUTH AFRICAN NATIONAL PARKS

Supervisor: Prof C Fabricius

Co-supervisor: Dr L Foxcroft

PIENAAR, Ryno Cuyler – CUM LAUDE

Title of Dissertation:

THE FEEDING ECOLOGY OF EXTRA LIMIT ALNYALA (TRAGELAPHUSANGASII) IN THE ARIDMOSAIC THICKET OF THE SOUTHERN CAPE

Supervisor: Prof LH Watson

Co-Supervisor: Mr AG Schmidt

Patent Applications Filed in 2013

FERG, E.E.; HLANGOTHI, S.P. and BAMBALAZA, S.E. Polymer based ceramifiable composition. South African patent application (ZA2013/05298).

HATTINGH, D.G.; VON WIELLIGH, L.G.; PENTZ, W.G. & DOUBELL, P. Method for repairing radially cracked hole. PCT application (PCT/IB2013/053608)

HATTINGH, S.D.W. Anthelmintic agent for treating birds. South African Patent Application (ZA2013/03935)

PHILLIPS, R.L. and PHILLIPS, E.E. Powerplant assembly for harnessing renewable energy. South African Provisional application (2013/5521)

PHILLIPS, R.L. Turbine arrangement. PCT application (PCT/IB2013/055239)

VORSTER, F.J.; SCHULTZ, R.D. & VAN DYK, E.E. Concentrator Photovoltaic Apparatus. South African Provisional Patent (2013/07270)

ZEELIE, B. & DUGMORE, G.M. Carbonaceous fines beneficiation using micro-algae and related processes. South African Patent application (ZA2013/00978); Australian Patent application (2011294860); US Patent application (13/818,287); European Patent application (11819477.8); Chinese Patent application (201180041182.1) and Indian Patent application (3026/CHENP/2013)

ZEELIE, B. Photobioreactor and process for the cultivation of microalgae. South African Provisional Patent (2013/06829)

ZEELIE, B. Processing carbonaceous materials. South African Provisional Patent (2013/08726)

ZEELIE, B. Upgrading coal fines using micro-algae. South African Provisional Patent (2013/03681)

Exhibitions and Performances

2013 SCHOOL OF MUSIC ART AND DESIGN

VISUAL ARTS ACTIVITIES: HOSTED COMPETITION ADJUDICATION AND EXHIBITIONS: QUAD GALLERY, NORTH CAMPUS

MARCH - Absa L'Atelier
JULY - Sasol New Signatures
SEPTEMBER - PPC Young Concrete Artist

RECIPIENTS OF SIGNIFICANT AWARDS, COMMISSIONS, AND INVITATIONS

- PPC Young Artist Winner of the First prize of R100 000: Josua Strumpfer
- Public Art Commission for Installation on Kings Beach: Mary Duker
- Commission of portrait bust of Bishop James Limba: Andrieta Wentzel
- Commission of Crucifix "Black Christ" Roman Catholic Church, Mdantsane, East London: David Jones
- Invited submission Public Metal Art, Stellenbosch: David Jones
- Invited submission for Contemporary Sculpture Exhibition, William Humphries Art Gallery, Kimberley: David Jones
- Two of our lecturers (Dr Erika Bothma and Erna Cloete) invited by UNISA to examine nationally
- Prof Albertyn invited to adjudicate ABSA's National Youth Music Competition in Cape Town

OTHER EXHIBITIONS AND WORKSHOPS

- Ceramics East Cape Workshop at Second Avenue Campus
- March: Artec New Signatures student participation
- June: Modern Miniatures Art invited staff and students
- July: Rodger Ballen Exhibition: Athenaeum, Port Elizabeth
- July: Student photography exhibition Athenaeum, Port Elizabeth
- July: Modern Miniatures National Arts Festival Grahamstown: Duker, Wentzel, Jones, Cilliers, Whitehead
- August: Student Fine Art Drawing Exhibition GFI Gallery, Park Drive
- September: Art meets Science meets Place: curated exhibition Quad Gallery North Campus
- September: Anva Chiazzari Glass Art Exhibition Artec
- November: Student Graduate Exhibitions, North Campus
- November – December: Masters Graduate Exhibitions Athenaeum, Central: Cedric van der Linden, Lisa Ledwick and Michael Wedderburn
- October - Collaboration with Department of Arts and Culture and NAC to host Abdullah Ibrahim Jazz workshop at NMMU
- October – Collaboration with the USA Consulate, Anthony Stanco conducted a Jazz Ensemble workshop

ENGAGEMENT

- Collaboration with Mandela Bay Development Agency: NMMU/BDA Art Project emanating from MoU
- Completion of Route 67 artworks: SoMAD Visual Arts Collectives

- Commission for Trinder Square Public Art interventions: Duker/Jones Trinity Session Consortium
- Collaborations with the Alliance Francaise: Richmond Hill Festival activities - Photography Exhibition and Fine Art Performance
- Music staff and students perform at various ECPO concerts throughout the year
- Collaboration with NMMU Arts and Culture: Isisuzo Concert
- Collaboration with Department of Arts and Culture and NAC to host Abdullah Ibrahim Concert
- Collaboration with the South African National Youth Orchestra, Department of Music hosted close to 100 participants from all over South Africa
- Collaboration with the USA Consulate to host the Anthony Stanco Quintet Concert
- Collaboration with Alliance Francaise: NMMU Big Band performed at the Richmond Hill Festival.

CONCERTS

- March - John Edwards Trio CD launch
- March - Lucas Vondracek (Russian pianist)
- March - Voice Studio Concert
- April - Guitar Studio Concert
- April - Creshwell October Jazz Concert
- May - Trio Broz, NMMU South Campus Auditorium
- May - Brass & Woodwind Studio Concert
- May - Woodwind Studio Concert
- May - Charles Bryars Scholarship Concert
- May - Jazz Studio Concert
- May - Santiago Canon Valencia (cello)
- June - Vassily Primakov (Russian pianist)
- August - Staff Chamber Lunch Hour Concert
- August - Voice Studio Concert
- August - Sergey Malov (Ukrainian violist) & Bryan Wallick (American pianist)
- August - Guitar Studio Concert
- August - Piano Studio Concert
- September - Woodwind Studio Concert
- September - Brass Studio Concert
- September - Organ Studio Concert
- October - Jazz Voice Studio Concert
- October - String Studio Concert
- October - Jazz Studio Concert
- October - Jan Hugo, SA pianist
- October - Composition Concert
- October - Prestige Concert
- November - Yura Lee, Korea

Publications

■ Faculty of Arts

DHET Accredited Journal Articles

ABABIO, E.P. & ASMAH-ANDOH, K. 2013. Decentralisation or Devolution: An analysis of local government effectiveness. *African Journal of Public Affairs* 6(3), pp. 38 – 53.

BOTHA, M.E. 2013. “Klipperigste klip”: Postmodernistiese elemente in Krog se “narratief van klip” in *Kleur kom nooit alleen nie*. *Stilet* 25(2), pp. 125 – 140.

CROUS, M.L. & KOEN, D. 2013. Reis en die jouissance van die imaginêre by Joan Hambridge. *Stilet* 25(2), pp. 56 – 67.

CROUS, M.L. 2013. Die uitbeelding van gay manlikheid in die werk van drie debuutdigters. *Litnet Akademies* 10(1), pp. 440 – 474.

CROUS, M.L. 2013. Marlene Dumas and the painting of (the) Flesh. *South African Journal of Art History* 28(2), pp. 49 – 58.

DRAAI, E.E. & OSHONIYI, O.A. 2013. Scarce and critical skills for local government: Assessing the Nelson Mandela Bay Metropolitan Municipality. *Journal of Public Administration* 48(4.1), pp. 867 – 882.

GOUWS, A., STEYN-KOTZE, J. & VAN WYK, J.A. 2013. Celebrating 40 Years: The state of political science in South Africa in 2014. *Politikon* 40(3), pp. 393 – 423.

GQAMANE, Z. & TAYLOR, J.D. 2013. Capacity building for effective local government leadership and governance. *Journal of Public Administration* 48(4.1), pp. 824 – 842.

HIBBERT, L. 2013. Visual evidence of self-inscription of identity by marginalized communities in Mitchell's Plain, South Africa. *South African Journal of Art History* 28(3), pp. 77 – 90.

HURST, A. 2013. Art and the dream of self-transcendence. *South African Journal of Art History* 28(3), pp. 91 – 103.

JANSE VAN VUUREN, H.E. 2013. J.M. Coetzee se *Summertime* (2009) as laatwerk. *Litnet Akademies* 10(2), pp. 602 – 628.

JEFFREY, C.D. 2013. The romance of knight rider. *English Academy Review* 30(1), pp. 131 – 134.

JORDAAN, D.J. 2013. Motorfietskultuur in Suid-Afrika: van leefwyse tot leefstyl. *Litnet Akademies* 10(1), pp. 249 – 279.

KHAN, F.; KHAN, S. & GOVENDER, J.P. 2013. The rhetoric of participation: A study of the planning and development of low-income human settlements in the province of Kwazulu-Natal. *Africanus: Journal of Development Studies* 43(1), pp. 126 – 143.

KONIK, A. & KONIK, I. 2013. The political significance of patina as materialised time. *South African Journal of Art History* 28(2), pp. 133 – 155.

KONIK, A. 2013. Materiality and time in Zack Snyder's *Sucker Punch* (2011). *South African Journal of Art History* 28(2), pp. 102 – 132.

LAMB, S. & SNODGRASS, L. 2013. Growing up with normalised violence: Narratives of South African youth. *Commonwealth Youth and Development* 11(1), pp. 4 – 21.

MAPHAZI, N.; RAGA, K.; TAYLOR, J.D. & MAYEKISO, T.V. 2013. Public participation: A South African local government perspective. *African Journal of Public Affairs* 6(2), pp. 56 – 67.

MASANGO, R.S. & MKUTHUKANA, B. 2013. Enhancing customer care in the public sector: The case of the Department of Basic Education in the province of the Eastern Cape. *Journal of Public Administration* 48(4.1), pp. 594 – 605.

MASANGO, R.S.; MFENE, P.N. & HENNA, T. 2013. An analysis of factors that negatively affect the performance of ward committees in the Buffalo City Municipality. *Africa Insight* 43(1), pp. 90 – 104.

MASONGO, R.S. & MPOFU, M. 2013. Staff retention in higher education institutions: A case of selected South African universities. *Journal of Public Administration* 48(4.1), pp. 883 – 896.

MAYEKISO, T.V.; TAYLOR, J.D. & DRAAI, E.E. 2013. Professionalism in meeting social assistance: Interventions adopted by the South African Social Security Agency. *Africa Insight* 43(3), pp. 1 – 15.

MFENE, P.N. 2013. Public accountability: A professional basis for the South African public service. *Administratio Publica* 21(1), pp. 6 – 23.

MORTON, D.G.; MAYEKISO, T.V. & CUNNINGHAM, P.W. 2013. South African Eastern Cape contexts influencing the quality of community home-based care. *Journal of Psychology in Africa* 23(2), pp. 363 – 366.

OLIVIER, B. 2013. Foucault en die vraag na die verligting (Foucault and the question concerning enlightenment). *Tydskrif vir Geesteswetenskappe* 53(3), pp. 314 – 330.

OLIVIER, B. 2013. Literature after Rancière: Ishiguro's 'When we were orphans and Gibson's *Neuromancer*'. *Journal of Literary Studies* 29(3), pp. 23 – 45.

OLIVIER, B. 2013. The human sciences and the 'crystals of time'. *Phronimon – Journal of the South African for Society Greek Philosophy and the Humanities* 14(1), pp. 15 – 42.

OLIVIER, B. 2013. The paradoxes of art. *South African Journal of Art History* 28(2), pp. 199 – 210.

OLIVIER, B. 2013. Time(s), space(s) and communication in Castells's Network Society. *Communicare: Journal for Communication Sciences in South Africa* 32(2), pp. 20 – 39.

PHASAWANA, N.; PELTZER, K.; CHIRINDA, W.; MUSEKIWA, A. & KOSE, Z. 2013. Socio-demographic predictors of multiple non-communicable disease risk factors among older adults in South Africa. *Global Health Action* 6, pp. 1–8.

POTGIETER, Z. 2013. From Freud to funny music in films: The case of 'Blazing Saddles'. *Communicatio* 30(3), pp. 344 – 361.

POTGIETER, Z. 2013. Towards the semiotic and symbolic in music theory and analysis: Kristeva's dialectics as a model for plurality in metadiscursive and discursive engagements with music. *Acta Academica* 45(4), pp. 119 – 153.

REDDY, P.S. & GOVENDER, J.P. 2013. Democratic decentralization, citizen engagement and service delivery in South Africa: a critique of legislative and policy considerations. *Africanus: Journal of Development Studies* 43(1), pp. 78 – 95.

SAAYMAN-HATTINGH, H.M. & MINKLEY, H. 2013. Narrative portrait photography and South African collector culture. *South African Journal of Art History* 28(2), pp. 85 – 101.

SMITH, N.J. 2013. Divided personas in the early poetry of Arthur Nortje. *Current Writing: Text and Reception in Southern Africa* 25(1), pp. 20 – 29.

SNODGRASS, L. & LAMB, S. 2013. Collective emotion and communal memory. The Psychopolitical dimensions of intractable conflict. *Africa Insight* 43(2), pp. 105 – 116.

SNODGRASS, L. & MWANIKA, P.A.N. 2013. Dynamics and politics of small arms and light weapons in violent conflicts arms control and its challenges in Somalia. *Africa Insight* 43(1), pp. 61 – 76.

TERBLANCHE, H.O. 2013. "De Overval": Aanslag op Suid-Afrikaanse Biblioteek in Amsterdam. *Journal for Contemporary History* 38(1), pp. 41 – 61.

ZDANOW, C.S. & WRIGHT, B. 2013. An 'abyss of self-love': an analysis of the structural components of Facebook. *Communicare: Journal for Communication Sciences in Southern Africa* 32(2), pp. 63 – 81.

Chapters in Books submitted to DHET for subsidy purposes

ABABIO, E.P. & ASMAH-ANDOH, K. 2013. A comparative analysis of local government in Ghana and South Africa in: VYAS-DOORGAPERSAAD, S.; TSHOMBE, L.M. & ABABIO, E.P. (Eds). *Public administration in Africa: performance and challenges*. CRC Press, New York, USA.

BOGOPA, D. 2013. Physical education in South Africa: Historical perspectives and research studies in Eastern Cape and Gauteng provinces in: CHEPYATOR-THOMSON, J.R. & HSU, S.H. (Eds). *Global perspectives on physical education and after-school sport programs*. University Press of America, Maryland, USA.

GIBBS, P.A. 2013. Political identity and democracy formation in the Eastern Cape, 1990 – 1994 in: PAHAD, E. (Ed). *The road to democracy in South Africa, Volume 6*. UNISA, Pretoria, South Africa.

OTTO, A. 2013. 'n Kritiese waardering van die hantering van kollokasies en idioom in die HAT (2005) in: BOTHA, W.; MAVOUNGOU, P. & NKOMO, D. *Festschrift Rufus H. Gouws*. SUN Press, Stellenbosch, South Africa.

Conference Proceedings submitted to DHET for subsidy purposes

CADLE, B.S. & KUHN, S. Critical design as critique of the design status quo. *Southern Africa Institute for Management Scientists*: 15 – 17 September 2013. *Proceedings of the Design Education Forum of Southern Africa*: Van der Bilj Park, South Africa, 02 – 03 September 2013.

ECONOMOU, I. Problematic motifs: portrayals and identity construction of women in visual consumer media. *Proceedings of the Design Education Forum of Southern Africa*: Van der Bilj Park, South Africa, 02 – 03 September 2013.

SWANEPOEL, M. The myth of unified global culture: Transcoding national cultures within website interfaces. *Proceedings of the Design Education Forum of Southern Africa*: Van der Bilj Park, South Africa, 02 – 03 September 2013.

Faculty of Business and Economic Sciences

DHET Accredited Journal Articles

ADENDORFF, C.; EMUZE, F. & WARD, G. 2013. Development model for family business successions evaluation with a South African case study. *South African Journal of Entrepreneurship and Small Business Management* 6, pp. 134 – 144.

ANSTEY, M. 2013. Marikana – and the push for a new South African pact. *South African Journal of Labour Relations* 37(2), pp. 133 – 145.

ARNOLDS, C.; STOFIE, R.N. & LILLAH, R. 2013. Assessing the outcomes of the higher education mergers in South Africa: Implications for strategic management. *Acta Commercii* 13(1), pp. 1 – 11.

BISMANS, F. & LE ROUX, P. 2013. Dating the business cycle in South Africa by using a Markov-switching model. *J.Stud.Econ.Econometrics* 37(3), pp. 25 – 39.

BREYTENBACH, N.; RENARD, M. & SNELGAR, R.J. 2013. The level of organisational identification amongst students at a post-merged South African university. *SA Journal of Human Resource Management* 11(1), pp. 98 – 111.

CHANZA, A.W.D.; SNELGAR, R.J. & LOUW, G.J. 2013. The motivational value of rewards amongst Malawi's health professionals. *SA Journal of Human Resource Management* 11(1), pp. 197 – 210.

CHERRY, J. & HATEGEKIMANA, C. 2013. Ending gender-based violence through grassroots women's empowerment: Lessons from post-1994 Rwanda. *Agenda* 95 (27.1), pp. 100 – 113.

- COETZEE, J.; VAN ZYL, H. & TAIT, M.** 2013. Perceptions of service quality by clients and contract-personnel in the South African retail banking sector. *Southern African Business Review* 17(1), pp. 1 – 22.
- COETZEE, G.P.; FOURIE, H.; PLANT, K. & BARAC, K.** 2013. Internal audit competencies: skills requirements for chief audit executives in South Africa. *Southern African Journal of Accountability and Auditing Research* 15, pp. 53 – 64.
- DODD, N.N. & SNELGAR, R.** 2013. Zulu Youth's Core Self-evaluations and Academic Achievement in South Africa: An Exploratory Study. *Journal of Psychology* 4(2), pp. 101 – 107.
- DOUBELL, M. & STRUWIG, M.** 2013. The Contribution of Environmental Factors to the Professional Success of Women. *Africa Insight* 42(4), pp. 144 – 165.
- DU PREEZ, M.; BEUKES, J. & VAN DYK, E.** 2013. A cost-benefit analysis of concentrator photovoltaic technology use in South Africa: A case study. *Journal of Energy in Southern Africa* 24(4), pp. 2 – 11.
- DU PREEZ, M. & SALE, M.** 2013. The impact of social housing developments on nearby property prices: A Nelson Mandela Bay case study. *South African Journal of Economics* 81(3), pp. 451 – 466.
- DU PREEZ, M.; LEE, D.E. & SALE, M.C.** 2013. Nonparametric estimation of a hedonic price model: A South African case study. *J.Stud.Econ. Econometrics* 37(2), pp. 41 – 61.
- ERASMUS, L.J.; STEYN, B.; FOURIE, H. & COETZEE, G.P.** 2013. The adequacy, use and compliance with internal auditing standards – South African perceptions in comparison with other specific regions. *Southern African Journal of Accountability and Auditing Research* 15, pp. 43 – 52.
- FARRINGTON, S.M.; SHARP, G. & GONGXEKA, V.** 2013. Employee perceptions and entrepreneurial intentions. *Journal of Contemporary Management* 10, pp. 77 – 99.
- FOURIE, H. & ACKERMAN, C.** 2013. The impact of COSO control components on internal control effectiveness: An internal audit perspective. *Journal of Economic and Financial Sciences* 6(2), pp. 495 – 518.
- FOURIE, H. & ACKERMANN, C.** 2013. The effect of COSO control environment attributes on the effectiveness of internal control: an internal auditor perspective. *Southern African Journal of Accountability and Auditing Research* 14, pp. 31 – 44.
- FOURIE, H.; PLANT, K.; COETZEE, G.P. & VAN STADEN, J.M.** 2013. Internal audit competencies: skills requirements for internal audit management in South Africa. *Southern African Journal of Accountability and Auditing Research* 15, pp. 75 – 86.
- KARUHANGA, B.N. & WERNER, A.** 2013. Challenges impacting performance management implementation in public universities. *African Journal of Economic and Management Studies* 4(2), pp. 223 – 243.
- LOUW, G.J.** 2013. Exploring recruitment and selection trends in the Eastern Cape. *SA Journal of Human Resource Management* 11(1), pp. 1 – 10.
- MANNIE, A.; VAN NIEKERK, H.J. & ADENDORFF, C.M.** 2013. Significant factors for enabling knowledge sharing between government agencies within South Africa. *South African Journal of Information Management* 15(1/2), pp. 116 – 123.
- MSUTHWANA, V.M.; TAIT, M. & MAZIBUKO, N.E.** 2013. A sustainable business development strategy for the automotive refinish distribution industry. *Journal of Contemporary Management* 10, pp. 59 – 76.
- OCRAN, M.K. & ANYIKWA, I.** 2013. Trends and volatility in residential property prices in South Africa. *J.Stud.Econ.Econometrics* 37(1), pp. 55 – 73.
- PERKS, S.** 2013. Factors impacting flyers as an effective promotional tool. *Journal of Contemporary Management* 10, pp. 405 – 426.
- PLANT, K.; COETZEE, G.P.; FOURIE, H. & STEYN, B.** 2013. Internal audit competencies: skills requirements for internal audit staff in South Africa. *Southern African Journal of Accountability and Auditing Research* 15, pp. 65 – 74.
- RADDER, L. & HAN, X.** 2013 Perceived Quality, Visitor Satisfaction And Conative Loyalty In South African Heritage Museums. *International Business and Econometrics Journal* 12(10), pp. 1261 – 1272.
- RAMUKUMBA, T.** 2013. Community tourism awareness campaign: Eden District Municipality, South Africa's example. *Tourism Review International* 17(2), pp. 103 – 113.
- RENARD, M. & SNELGAR, R.J.** 2013. Exploring the Factor Structure of the Proactive Coping Inventory: A Southern African Study. *Journal of Psychology in Africa* 23(3), pp. 519 – 522.
- ROOTMAN, C. & GALLOWAY, L.** 2013. Young adults' perceptions and buying intentions of healthy foods in South Africa. *Journal of Contemporary Management* 10, pp. 176 – 200.
- ROOTMAN, C. & ZEKA, B.** 2013. The brand image and performance of small and medium enterprises: How can social responsibility activities help? *Acta Commercii* 13(1), pp. 1 – 9.
- ROOTMAN, C.; TAIT, M. & SHARP, G.** 2013. The influence of demographic variables on relationship banking: an international study. *Global Business and Economics Review* 15(2/3), pp. 133 – 147.
- SNELGAR, R.J.; RENARD, M. & VENTER, D.** 2013. An empirical study of the reward preferences of South African employees. *SA Journal of Human Resource Management* 11(1), pp. 1 – 14.
- VAN GREUNEN, C.; VIVIERS, S. & VENTER, E.** 2013. The likelihood of unethical behavior in the life insurance sector in South Africa: An empirical investigation. *Management Dynamics* 22(3), pp. 13 – 38.
- VENTER, E.; FARRINGTON, S. & SHARP, G.** 2013. The influence of relational-based issues on job satisfaction and organizational commitment in family businesses: The views of non-family employees. *Management Dynamics* 22(4), pp. 38 – 57.

ZEELIE, E.J. & LLOYD, H.R. 2013. A framework for South African industrial cluster identification and analysis. *Journal for Studies in Economics and Econometrics* 37(2), pp. 1 – 21.

Book Chapters submitted to DHET for subsidy purposes

CHERRY, J. 2013. Supporting war resistance in the South African struggle: The end conscription campaign and the committee on South African war resistance in: PAHAD, E. (Ed). *The road to democracy in South Africa, Volume 6*. UNISA, Pretoria, South Africa.

CHERRY, J. 2013. The intersection of violent and non-violent strategies in the South African Liberation Struggle in: SAPIRE, H. & SAUNDERS, C. *Southern African Liberation Struggles – new local, regional and global perspectives*. UCT Press, Cape Town, South Africa.

HATEGEKIMANA, C. 2013. The connectedness of masculinity and culture in the context of HIV and AIDS: Special focus on Rwanda in: CHITANDO, E. & CHIRONGOMA, S. *Redemptive masculinities*. World Council of Churches Publications, Harare, Zimbabwe.

MXUNYELWA, S. & TASSIOPOULOS, D. 2013. The social impacts of events: The case of the triathlon event “Spec-savers Ironman” in South Africa in: RICHARDS, G.; DE BRITO, M.P. & WILKS, L. *Exploring the social impacts of events*. Routledge, New York, USA.

TASSIOPOULOS, D. 2013. Entrepreneurship and facilities management in: HASSANIEN, A. & DALE, C. (Eds). *Facilities management and development for tourism, hospitality and events*. CABI, Boston, USA.

Conference Proceedings submitted to DHET for subsidy purposes

BECK, T. & PELLE, P. Investigating the influence of expected rewards on the career intentions of accounting students. *Southern Africa Institute for Management Scientists*: 15 – 17 September 2013, Potchefstroom, South Africa.

CALITZ, A.; CULLEN, M. & VAN OUDTSHOORN, C. A framework for cross-border hospitality expansion. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

CULLEN, M.; CALITZ, A. & SALIE, N. Muslim women’s participation in family businesses. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

CULLEN, M.; CALITZ, A. & VON HOFFMANN, E. The influence of copreneurial relationships on the restaurant industry. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

DALMEYER, P.; STRUWIG, M. & KRUGER, T. Education and training of professionals in South Africa: A comparative study of medical professions versus accounting and law professions. *World Academy of Researchers, Educators and Scholars in Business, Social Sciences, Humanities and Education*: Cape Town, South Africa, 22 – 25 July 2013.

DOUBELL, K. & STRUWIG, M. Barriers to professional women’s career success in South Africa. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

DOUBELL, M. & STRUWIG, M. A study of the relationships between cultural factors and perceived success of professional and business women. *World Academy of Researchers, Educators and Scholars in Business, Social Sciences, Humanities and Education*: Cape Town, South Africa, 22 – 25 July 2013.

FARRINGTON, S.; VENTER, E.; LETELE-MATABOOE, M. & SHARP, G. Investigating the influence of selected reward on the job satisfaction and organisational commitment levels of non-family employees working in family businesses. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

FISH, C.; ADENDORFF, C.M. & JONKER, K. An investigation into factors impacting on exports from South Africa to the Southern African development community (SADC). *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

GALLANT, W. & RENARD, M. Individuals’ perceptions towards Facebook and LinkedIn as recruitment tools: An exploratory study. *Southern Africa Institute for Management Scientists*: 15 – 17 September 2013, Potchefstroom, South Africa.

GRAY, B.; CARELSEN, M. & VENTER, E. The marketing tasks of small business owners in Nelson Mandela Bay. *Southern Africa Institute for Management Scientists*: 15 – 17 September 2013, Potchefstroom, South Africa.

JANSE VAN RENSBURG, H. & GOUWS, D. Unmasking the future cash flow construct. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

JOOSTE, L. A performance evaluation by means of income and cash flows during life cycles. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

KRÜGER, J.; MAZIBUKO, N.E. & BAILEY, P.J. Organisational commitment and job involvement in automotive industry. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

LEE, D. The management of estuarine recreational services in South Africa: The Sunday’s River estuary. *Southern Africa Institute for Management Scientists*: Potchefstroom, South Africa, 15 – 17 September 2013.

LILLAH, R. & STRUWIG, M. A framework to manage corporate sustainability. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

LLOYD, H.; MEY, M.R. & RAMALINGEN, K. The veracity of values. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

MATCHABA-HOVE, T. & FARRINGTON, S. Entrepreneurial orientation and family businesses success: An exploratory study. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

MAZIBUKO, N.E.; SMITH, E.E. & TSHUMA, E. The role of stakeholder consultation in the privatisation of parastatals. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

MUGANO, G.; BROOKES, M. & LE ROUX, P. The impact of a SADC customs union on Zimbabwe. *Southern Africa Institute for Management Scientists: Potchefstroom, South Africa*, 15 – 17 September 2013.

NGXUKUMESHE, T.; MAZIBUKO, N. & SMITH, E. Developing a hypothetical model of organisational citizenship behaviour in retail firms. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

OKWARE, F.; PERKS, S. & SMITH, E. Employee-related factors impacting the performance of training institutions in developing countries. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

OOSTHUIZEN, N. & PERKS, S. The relationship between factors that influence attitude towards internet banking. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

PERKS, S. Improving the trading environment of the South African hawkers industry. *Southern Africa Institute for Management Scientists: Potchefstroom, South Africa*, 15 – 17 September 2013.

PERKS, S. & AUSTIN, G.D. Exploring business growth aspirations and strategic planning of hair dressing salons in South Africa. *Conference of Interdisciplinary Business and Economics Research: Kuala Lumpur, Malaysia*, 15 – 16 February 2013.

PERKS, S. & OOSTHUIZEN, N. Exploring supplier negotiation best practices and supplier relationships strategies in South Africa. *Conference of Interdisciplinary Business and Economics Research: Kuala Lumpur, Malaysia*, 15 – 16 February 2013.

POISAT, P. A phenomenological study of supervisors' behaviours for engaging production workers. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

POISAT, P.; MEY, M.R. & THERON, A.V. Factors affecting burnout amongst cash-in-transit employees. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

POTGIETER, A.; MAZIBUKO, N.E. & TAIT, M. Motivational factors that influence individual performance. *Proceedings of the 2013 Annual Conference of the Emerging Markets Conference Board: Port Elizabeth, South Africa*, 17 – 20 June 2013.

ROOTMAN, C. & GALLOWAY, K. Media influencing consumer buying behaviour in the healthy fast-casual restaurant industry of South Africa. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

ROOTMAN, C. & KRUGER, J. Customer satisfaction in the financial planning and retail banking industries in South Africa. *World Academy of Researchers, Educators and Scholars in Business, Social Sciences, Humanities and Education: Cape Town, South Africa*, 22 – 25 July 2013.

ROOTMAN, C. & STRUWIG, M. A study of student perceptions of sustainability at a South African university. *World Academy of Researchers, Educators and Scholars in Business, Social Sciences, Humanities and Education: Cape Town, South Africa*, 22 – 25 July 2013.

ROOTMAN, C. & TAIT, M. Banking clients' perceptions on customer retention: Lessons to an emerging economy. *Proceedings of the 2013 Annual Conference of the Emerging Markets Conference Board: Port Elizabeth, South Africa*, 17 – 20 June 2013.

ROOTMAN, C. & ZEKA, B. Relationships between business social responsibility dimensions and business performance in SMES. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

SALE, M. & DU PREEZ, M. Municipal management of property valuations for rates purposes: A market-based municipal assessment model versus an attributes-based hedonic price model. *Southern Africa Institute for Management Scientists: Potchefstroom, South Africa*, 15 – 17 September 2013.

SAUNDERS, S. & FARRINGTON, S. Assessing the entrepreneurial attributes of undergraduate business students at the NMMU. *Southern Africa Institute for Management Scientists: Potchefstroom, South Africa*, 15 – 17 September 2013.

SCHOLTZ, B.; HALBERSTADT, J.; NICOLAI, A.; SCHURICHT, M. & HOCHSCHULE, J. An investigation into entrepreneurial intentions, motivations and barriers for South African and German students. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

SMITH, E. & MULLER, R. Perceptions regarding ethical and social responsibility practices: An SME perspective. *Southern Africa Institute for Management Scientists: Potchefstroom, South Africa*, 15 – 17 September 2013.

SMITH, E.E.; MAZIBUKO, N.E. & XINGWANA, L. Impact of skill shortages on propensity to leave in South African gold mines. *Southern Africa Institute for Management Scientists: Potchefstroom, South Africa*, 15 – 17 September 2013.

STRUWIG, F.W. & MARRIOTT, A. A framework to investigate private label brands at Pick 'n Pay stores. *Southern Africa Institute for Management Scientists: Potchefstroom, South Africa*, 15 – 17 September 2013.

STRUWIG, F.W.; DUCIE, G. & MUTHWA, S. Relational sustainability indicators in infrastructure development at a university. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

STRUWIG, F.W.; SMIT, G. & VAN WYK, J.J. Green building guidelines at South African universities. *Fourth International Conference on Environmental Engineering and Applications: Singapore*, 24 – 25 August.

STRUWIG, M. & DUCIE, G. The financial viability of sustainable infrastructure development at a university. *World Academy of Science, Engineering and Technology: Deira, Dubai*, 30 – 31 January 2013.

TAIT, M. & TAIT, A.M. Mobile money: Why is it not getting off the ground in South Africa? *International Academy of Business and Public Administration Disciplines Conference: Florida, USA*, 02 – 05 January 2013.

VAN DER MERWE, S.; FARRINGTON, S. & VENTER, E. The influence of family relationships on the future continuity of family businesses. *Seventh International Business Conference: Seychelles*, 02 – 05 September 2013.

VENTER, E. & FARRINGTON, S. The relationship between entrepreneurial intention and entrepreneurial education among students at a higher educational institution in South Africa – an exploratory study. *Southern Africa Institute for Management Scientists*: Potchefstroom, South Africa, 15 – 17 September 2013.

■ Faculty of Engineering, the Built Environment and Information Technology

DHET Accredited Journal Articles

ABOU-EL-HOSSEIN, K. & RITCHIE, G. 2013. Development of electrolytic in-process dressing setup for precision grinding: A final-year project. *Journal of Engineering Technology* 30(1), pp. 38 – 42.

ABOU-EL-HOSSEIN, K. 2013. Quality of silicon convex lenses fabricated by ultra-high precision diamond machining. *South African Journal of Industrial Engineering* 24(1), pp. 91 – 97.

ABOU-EL-HOSSEIN, K.; OLUFAYO, O. & MKOKO, Z. 2013. Diamond tool wear during ultra-high precision machining of rapidly solidified aluminium RSA 905. *WEAR* 302(1-2), pp. 1105 – 1112.

ABOU-EL-HOSSEIN, K.; OLUFAYO, O. & MKOKO, Z. 2013. Performance of diamond inserts in ultra-high precision turning of Cu-Cr-Zr alloy. *WEAR* 302(1-2), pp. 1098 – 1104.

ADEBESIN, F.; FOSTER, R.; KOTZE, P. & VAN GREUNEN, D. 2013. A review of interoperability standards in e-Health and imperatives for their adoption in Africa. *The South African Computer Journal* 50, pp. 55 – 72.

BASQUITH, D.; YEROKHIN, A.; JAMES, N.; YATES, J. & MATTHEWS, A. 2013. Evaluation of residual stress development at the interface of plasma electrolytically oxidized and cold-worked aluminium. *Metallurgical and Materials Transactions A* 44(10), pp. 4461 – 4465.

BULBRING, D.L.H.; HATTINGH, D.G.; BOTES, A. & ODENDAAL, D.H. 2013. Friction hydro pillar process as an alternative repair technology for creep evaluation sites on thick-walled 10CrMo910 creep-resistant steel structures. *The Journal of the Southern African Institute of Mining and Metallurgy* 113(2), pp. 129 – 136.

BUYS, F. & LE ROUX, M. 2013. Causes of defects in the South African housing construction industry: Perceptions of built-environment stakeholders. *ACTA Structilia* 20(2), pp. 78 – 99.

COETZEE, A. & VAN NIEKERK, T.I. 2013. Labview application with embedded lua scripting for a laser based measuring machine. *Journal for New Generation Sciences* 11(1), pp. 42 – 56.

DE LA HARPE, R.; LOTRIET, H.; POTTAS, D. & KORPELA, M. 2013. Socio-technical approach to community health: designing and developing a mobile care data application for home-based healthcare, in South Africa. *Journal of Community Informatics* 9(2), pp. 1 – 10.

DU PLESSIS, H.E.; FORBES, R.P.; BARNARD, W.; ERASMUS, W.J. & STEUWER, A. 2013. In situ reduction study of cobalt model Fischer-Tropsch synthesis catalysts. *Physical Chemistry Chemical Physics* 15(28), pp. 11640 – 11645.

EMUZE, F. & ADLAM, R. 2013. Implementation of broad-based black economic empowerment in construction: A South African metropolitan area study. *ACTA Structilia* 20(1), pp. 126 – 154.

EMUZE, F. & JAMES, M. 2013. Exploring communication challenges due to language and cultural diversity on South African construction sites. *ACTA Structilia* 20(1), pp. 44 – 65.

EMUZE, F.; MATSHILI, H. & BOTHA, B. 2013. Post-occupancy evaluation of office buildings in a Johannesburg country club estate. *ACTA Structilia* 20(1), pp. 89 – 110.

EMUZE, F.A. & SMALLWOOD, J.J. 2013. Management concepts and project performance: Perceptions from the South African public sector environment. *Journal of the South African Institution of Civil Engineering* 55(2), pp. 21 – 28.

GEMINIANI, F.L.; SMALLWOOD, J.J. & FEE, S. 2013. A comparative analysis between contractors' and inspectors' perceptions of the department of labour occupational health and safety inspectorate relative to South African construction. *Safety Science* 53, pp. 186 – 192.

GERBER, T. & THOMSON, K. 2013. Risk management of VoIP implementation. *African Journal of Business Management* 7(36), pp. 3739 – 3746.

JAMES, M.N. 2013. Fractographic insights into cracking mechanisms and microstructure. *Fatigue and Fracture of Engineering Materials & Structures* 36(9), pp. 851 – 860.

JAMES, M.N.; CHRISTOPHER, C.J.; LU, Y. & PATTERSON, E.A. 2013. Local crack plasticity and its influences on the global elastic stress field. *International Journal of Fatigue* 46, pp. 4 – 15.

JAMES, M.N.; LU, Y.; PATTERSON, E.A. & CHRISTOPHER, C.J. 2013. Crack path support for deformation mechanisms in fatigue of polycarbonate. *Engineering Fracture Mechanics* 108, pp. 89 – 97.

JANSSON, K. & VON SOLMS, R. 2013. Phishing for phishing awareness. *Behaviour and Information Technology* 32(6), pp. 584 – 593.

JOHL, C.; VON SOLMS, R. & FLOWERDAY, S. 2013. Information technology governance process maturity in higher education institutions in South Africa. *South African Journal of Higher Education* 27(3), pp. 627 – 644.

LOPEZ-CRESPO, P.; WITHERS, P.J.; YUSOF, Y.; DAI, H. & STEUWER, A. 2013. Overload effects on fatigue crack-tip fields under plane stress conditions: surface and bulk analysis. *Fatigue and Fracture of Engineering Materials & Structures* 36(1), pp. 75 – 84.

LOURENS, A. & JONKER, J.A. 2013. An integrated approach for developing a technology strategy framework for small to medium sized furniture manufacturers to improve competitiveness. *South African Journal of Industrial Engineering* 24(1), pp. 50 – 67.

MOSTERT-PHIPPS, N.; POTTAS, D. & KORPELA, M. 2013. A South African perspective on factors that impact on the adoption and meaningful use of health information technologies. *South African Family Practice* 55(6), pp. 545 – 554.

NORMAN, A.R.; SCHÖNBERG, A.; GORLACH, I.A. & SCHMITT, R. 2013. Validation of iGPD as an external measurement system for cooperative robot positioning. *International Journal of Advanced Manufacturing Technology* 64(1), pp. 427 – 446.

POTGIETER, M. & VAN NIEKERK, J. 2013. Multi-Agent augmented computer vision technologies to support human monitoring of secure computing facilities. *SAIEE Africa Research Journal* 104(2), pp. 80 – 88.

SHOZI, N.; POTTAS, D. & MOSTERT-PHIPPS, N. 2013. Perceived benefits of remote data capturing in community home-based care: the caregivers' perspective. *Journal of Community Informatics* 9(2).

SMITH, F. 2013. A new methodology for single event transient suppression in flash FPGAs. *Microprocessors and Microsystems* 37(3), pp. 313 – 318.

STIEGER, E. & VON SOLMS, R. 2013. A framework for a personal information security agent. *INFORMATION: An International Interdisciplinary Journal* 16(6B), pp. 4063 – 4092.

VAN NIEKERK, J. & VON SOLMS, R. 2013. A theory based approach to information security culture change. *INFORMATION: An International Interdisciplinary Journal* 16(6B), pp. 3907 – 3930.

VON SOLMS, R. & DE LANGE, E. 2013. SENPORTAL: Internet-based services for senior citizens. *African Journal of Information and Communication* 13, pp. 76 – 81.

VON SOLMS, R. & VAN NIEKERK, J. 2013. From information security to cyber security. *Computers and Security* 38, pp. 97 – 102.

Conference Proceedings submitted to DHET for subsidy purposes

ABOU-EL-HOSSEIN, K. Form accuracy of germanium convex lens produced by ultrahigh precision diamond turning. *Sixth International Engineering Conference, Energy and Environment*: Kuching, Malaysia, 01 – 04 July 2013.

ABOU-EL-HOSSEIN, K.; NEETHLING, J. & OLUFAYO, O. Ultra-high precision machining of modified high strength aluminium for optical mould inserts. *International Conference on Competitive Manufacturing*: Stellenbosch, South Africa, 30 January – 01 February 2013.

MAISIZA, M.; MOSTERT-PHIPPS, N. & POTTAS, D. Patient preferences regarding storage media for medical records. *Health Informatics South Africa*: Port Elizabeth, South Africa, 03 July 2013.

ADEBESIN, T.; KOTZE, P.; VAN GREUNEN, D. & FOSTER, R. 2013. Barriers and challenges to the adoption of e-health standards in Africa. *Health Informatics South Africa*: Port Elizabeth, South Africa, 03 July 2013.

ADENDORFF, G.L.; SMALLWOOD, J. & ADENDORFF, C.M. Causal layered analyses for Africa's built environment towards 2050. *SB 13 Southern Africa Conference*: Cape Town, South Africa, 15 – 16 October 2013.

ADESEMOWO, A.K. & THOMPSON, K.L. Service desk link into IT asset disposal: A case of a discarded IT asset. *Fifth International Conference on Adaptive Science and Technology*: Pretoria, South Africa, 25 – 27 November 2013.

ADIAM, F.; OBERHOLSTER, R. & SWART, B. An automated system approach for centre pivot field irrigation. *South African University Power Engineering Conference*: Potchefstroom, South Africa, 31 January – 01 February 2013.

AGHERDIEN, S. & SMALLWOOD, J. Women in South African Construction. *World Building Congress 2013*: Brisbane, Australia, 05 – 09 May 2013.

AIYETAN, O. & SMALLWOOD, J. Materials management and waste minimisation on construction sites in Lagos state, Nigeria. *Fourth International Conference on Engineering, Project, and Production Management*: Bangkok, Thailand, 23 – 25 October 2013.

ALLEN, C.; SMALLWOOD, J. & EMUZE, F.A. Perceptions of built environment students to the environment and services course. *SB 13 Southern Africa Conference*: Cape Town, South Africa, 15 – 16 October 2013.

AYOMOH, M.K.; ABOU-EL-HOSSEIN, K. & OLUFAYO, O. Cutting force prediction for single point diamond tool-tip. *Sixth Robotics and Mechatronics Conference*: 30 – 31 October 2013.

BARTH, D.; GORLACH, I. & GRUHLER, G. Modelling of a thermal spraying controller using Matlab/Simulink. *Proceedings of the 2013 International Conference on Systems, Control and Informatics*: Venice, Italy, 28 – 30 September 2013.

BHUNU SHAVA, F. & VAN GREUNEN, D. Factors affecting user experience with security features: A case study of an academic institution in Namibia. *2013 Information Security for South Africa*: Johannesburg, South Africa, 14 – 16 August 2013.

BOTHA, B.; MAHLANGABEZA, L. & ADENDORFF, C.M. Graduate students' perceptions on the MSC built environment curriculum for sustainable development education. *SB 13 Southern Africa Conference*: Cape Town, South Africa, 15 – 16 October 2013.

BOX, D. & POTTAS, D. Improving information security behaviour in the healthcare context. *Centeris*: Lisbon, Portugal, 23 – 25 October 2013.

BUTGEREIT, L. & BOTHA, R.A. A comparison of different calculations for N-Gram similarities in a spelling corrector for mobile instant messaging language. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists*: East London, South Africa, 07 – 09 October 2013.

BUTGEREIT, L. & BOTH, R.A. An architecture for synchronous microvolunteering in Africa using social media. *International Conference on Pervasive Computing and Communications*: San Diego, California, USA, 18 – 22 March 2013.

BUTGEREIT, L. & BOTH, R.A. Can micro-volunteering help in Africa? *IST-Africa 2013*: Nairobi, Kenya, 29 – 31 May 2013.

BUTGEREIT, L. & BOTH, R.A. Predictable patterns in microtext as seen in Educational applications using Mxit in South Africa. *IEEE Africon Conference*: Mauritius, 09 – 12 September 2013.

BUYS, S. & VAN NIEKERK, T.I. Genetic algorithm for artificial neural network training for the purpose of automated part recognition. *International Conference on Competitive Manufacturing*: Stellenbosch, South Africa, 30 January – 01 February 2013.

CHINYAYI, S. & CRAFT, G.J. 2013. Accessibility of Nelson Mandela Metropolitan University's library buildings to the visually impaired. *Sixth Annual SACQSP Research Conference on "Green Vision 20/20"*: Cape Town, South Africa, 20 – 21 June 2013.

CHURCH, K. & POTTAS, D. Logic and cognitive complexity as indicators of progression and articulation: The case of vocational and professional IT qualifications. *Joint International Conference on Engineering Education and Research and International Conference Information Technology*: Cape Town, South Africa, 08 – 12 December 2013.

COERTZE, J. & VON SOLMS, R. A software gateway to affordable and effective information security governance in SMEs. *2013 Information Security for South Africa*: Johannesburg, South Africa, 14 – 16 August 2013.

COLESKY, M.; FUTCHER, L. & VAN NIEKERK, J.F. Design patterns for secure software development: demonstrating security through the MVC pattern. *Proceedings of the 15th Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

DU PLESSIS, A. Wikis and powerpoint as cognitive development tools in scientific literacy: A proposed heuristic. *Information and Communication Technology in Natural Science Education*: Siauliai, Lithuania, 24 – 25 October 2013.

DU TOIT, W. & SMALLWOOD, J. Optimising health and safety (H&S) management by aligning job task to risk behaviour profile matching. *Fourth International Conference on Engineering, Project, and Production Management*: Bangkok, Thailand, 23 – 25 October 2013.

EMUZE, F. & SMALLWOOD, J. Construction motor vehicle accidents in South Africa: Causes and impact. *Proceedings of the 29th Annual ARCOM Conference*: Reading, United Kingdom, 02 – 04 September 2013.

EMUZE, F. & SMALLWOOD, J. Engineering graduates and the practice of construction management. *Seventh International Conference on Construction in the 21st Century*: Bangkok, Thailand, 19 – 21 December 2013.

EMUZE, F. & SMALLWOOD, J. Mapping 'rework' related findings in South Africa. *New Developments in Structural Engineering and Construction*: Honolulu, USA, 18 – 23 June 2013.

EMUZE, F.; DUMINY, H.; SHAKANTU, W. & SMALLWOOD, J. Insights about concrete spalling in a South African region. *Seventh International Conference on Construction in the 21st Century*: Bangkok, Thailand, 19 – 21 December 2013.

EMUZE, F.A. & SMALLWOOD, J. How can supply chain management proliferate in South African construction? *Proceedings of the 29th Annual ARCOM Conference*: Reading, United Kingdom, 02 – 04 September 2013.

EMUZE, F.A.; SANDERSON, T. & SHAKANTU, W. Perceived impact of the market on the business of regional contractors: A South African context. *Proceedings of the 29th Annual ARCOM Conference*: Reading, United Kingdom, 02 – 04 September 2013.

EMUZE, F.A.; KLAAS, V. & SMALLWOOD, J. A case for deepened construction supply chain management in South African state-owned enterprises. *West Africa Built Environment Research Conference*: Accra, Ghana, 12 – 14 August 2013.

EMUZE, F.A.; MASILELA, B.I. & BOTH, B. Comprehending delayed payments in Swaziland: Results of an exploratory survey. *Second International Conference on Infrastructure and Development in Africa*: Johannesburg, South Africa, 17 – 19 March 2013.

EMUZE, F.A.; MATSHILI, H. & BOTH, B. A case for improved indoor environmental quality (IEQ) in multi-use buildings. *West Africa Built Environment Research Conference*: Accra, Ghana, 12 – 14 August 2013.

EMUZE, F.A.; MGUDLWA, N.P. & BOTH, R.A. Architects' perceptions of biodiversity and energy efficiency in the city of Cape Town, South Africa. *SB 13 Southern Africa Conference*: Cape Town, South Africa, 15 – 16 October 2013.

FELLER, J.; PHIPPS, W.; HARRIS, R.T. & ROBERTS, A.G. Wind turbine control strategy for shaft stress reduction. *IEEE International Conference on Industrial Technology*: Cape Town, South Africa, 25 – 27 February 2013.

FERNANDES, J. & VAN NIEKERK, J. Implementation of an industrial controller for a ball-on wheel system. *Sixth Robotics and Mechatronics Conference*: Durban, South Africa, 30 – 31 October 2013.

FERREIRA, T.P. & GORLACH, I.A. Development of a controller for a reconfigurable manufacturing cell. *Recent Advances in Telecommunications & Circuits*: Dubrovnik, Croatia, 25 – 27 June 2013.

FIDDER, H.; BOTES, A.; WOUDBERG, S. & MCGRATH, P.J. Characterization of microstructures and fatigue life of CP titanium grade 2 specimens subject to various bending processes. *Surface effects and contact mechanics XI*: Siena, Italy, 05 – 06 July 2013.

FRANS, S.; CUMBERLEGE, R. & DENT, S. The impact of the built environment on climate change. *Sixth Annual SACQSP Research Conference on "Green Vision 20/20"*: Cape Town, South Africa, 20 – 21 June 2013.

FUTCHER, L.A. & YNGSTROM, L. A review of IFIP TC11 WG11.8 publications through the ages. *IFIP World Conference on Information Security Education*: Auckland, New Zealand, 08 – 10 July 2013.

GERBER, M. & FUTCHER, L. Towards a blended learning approach to improving the coordination and supervision of student projects. *Joint International Conference on Engineering Education and Research and International Conference Information Technology*: Cape Town, South Africa, 08 – 12 December 2013.

GOLDSWAIN, C. & SMALLWOOD, J. Key inputs into a designing for construction health, safety, and ergonomics model in South Africa. *Proceedings of the Twenty-ninth Annual ARCOM conference*: Reading, United Kingdom, 02 – 04 September 2013.

HASKINS, B. & BOTHA, R.A. Identifying tag word counterparts for Dr.Math. *Analyzing Microtext*: Palo Alto, USA, 10 – 13 September 2013.

HASKINS, B. & BOTHA, R.A. Rendering Dr. Math® learner queries with HTML5 and SVG. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

HASKINS, B. & NEL, W. Development of an online portal for conference management. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

HONU, M.; LARYEA, S. & SMALLWOOD, J. Conceptual model for integrating health and safety into construction procurement in Ghana. *West Africa Built Environment Research Conference*: Accra, Ghana, 12 – 14 August 2013.

HUTTON, D. & VAN NIEKERK, J. The use of machine learning techniques to optimize admission requirements at a higher educational institution. *Health Informatics South Africa*: Port Elizabeth, South Africa, 03 July 2013.

ISABIRYE, N.; FLOWERDAY, S. & VON SOLMS, R. A developing country market model for voice-based information services. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

JOJO, S. & MOSTERT-PHIPPS, N. Awareness and interest in web-based personal health records. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

KAJIMO-SHAKANTU, K.; KAVELA, L.T.T. & SHAKANTU, W. Applicability and constraints of delivering water infrastructure via public private partnership. *Twenty-seventh IPMA World Congress*: Dubrovnik, Croatia, 30 September – 03 October 2013.

KATIVU, K. & POTTAS, D. Challenges facing teleradiology in the Eastern Cape public health service: An IT technician perspective. *Joint International Conference on Engineering Education and Research and International Conference Information Technology*: Cape Town, South Africa, 08 – 12 December 2013.

LIGHT, T.V.; GORLACH, I.A.; SCHÖNBERG, A. & SCHMITT, R. Application of a camera for measuring robot position accuracy. *International Conference on Competitive Manufacturing*: Stellenbosch, South Africa, 30 January – 01 February 2013.

LÖTTER, M.R. & FUTCHER, L.A. Towards the development of a framework to assist email clients in the identification of phishing attacks. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

LOUW, A. & BEYERS, R.N. An alternative approach to manufacturing studies and engineering innovation teaching. *Proceedings of the Twenty-Fifth Annual South African Institute for Industrial Engineering Conference*: Stellenbosch, South Africa, 09 – 11 July 2013.

MAKEDAMA, N. & GERBER, M. Criteria for promoting information security awareness regarding online banking amongst clients. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

MALI, N. & VAN NIEKERK, J. Towards a cyber security awareness syllabus for primary school children. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

MARAIS, C. & VAN NIEKERK, J. Are you human? – A framework to prevent automated web-form submissions. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

MASHAPA, J.; CHELULE, E.; VAN GREUNEN, D. & VELDSMAN, A. Managing user experience – managing change. *IFIP TC 13 International Conference, Human-Computer Interaction – INTERACT*: Cape Town, South Africa, 02 – 06 September 2013.

MINKLEY, W.; PHIPPS, W.; HARRIS, R.T. & ROBERTS, A.G. Restricted earth fault relay application on shunt capacitor bank design with synchronized switching. *IEEE International Conference on Industrial Technology*: Cape Town, South Africa, 25 – 27 February 2013.

MOSTERT-PHIPPS, N.; POTTAS, D. & KORPELA, M. Guidelines to encourage the adoption and meaningful use of health information technologies in the South African healthcare landscape. *Medinfo*: Copenhagen, Denmark, 20 – 23 August 2013.

MXOLI, A. & MOSTERT-PHIPPS, N. An analysis of web-based personal health records. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

NDIHOKUBWAYO, R.; CRAFFORD, G. & BUYS, F. Alignment of project objectives with incentives to achieve successful delivery of infrastructures. *Second International Conference on Infrastructure Development in Africa*: Johannesburg, South Africa, 17 – 19 March 2013.

NDIHOKUBWAYO, R.; CRAFFORD, G. & BUYS, F. Construction and consultant team members' motivational factors towards a successful infrastructure delivery. *Second International Conference on Infrastructure Development in Africa*: Johannesburg, South Africa, 17 – 19 March 2013.

NDIHOKUBWAYO, R.; CRAFFORD, G. & BUYS, F. Consultant team members' performance evaluation against incentives towards the achievement of green building principles. *Sixth Annual SACQSP Research Conference on "Green Vision 20/20"*: Cape Town, South Africa, 20 – 21 June 2013.

NDIHOKUBWAYO, R.; CRAFFORD, G. & BUYS, F. Incentives as an activation agent for construction and consultant team members to enhance a successful construction project delivery. *Seventh Built Environment Conference*: Cape Town, South Africa, 28 – 30 July 2013.

OBIOZO, R. & SMALLWOOD, J. Biophilic workplace design: Improving construction ergonomics and workers' performance through enhanced sustainable and psychosocial value of the worksite. *New Developments in Structural Engineering and Construction*: Honolulu, USA, 18 – 23 June 2013.

OBIOZO, R. & SMALLWOOD, J. The role of 'Greening' and an ecosystem approach to enhancing construction ergonomics. *Proceedings of the Twenty-ninth Annual ARCOM conference*: Reading, United Kingdom, 02 – 04 September 2013.

OBIOZO, R.N. & SMALLWOOD, J. Psychotherapeutic and team building initiative of greening construction sites – the case study of an 'oasis in the desert'. *SB 13 Southern Africa Conference*: Cape Town, South Africa, 15 – 16 October 2013.

OLUFAYO, O. & ABOU-EL-HOSSEIN, K. Molecular dynamics modeling of nanoscale machining of silicon. *Fourteenth CIRP conference on modelling of machining operations*: Turin, Italy, 13 – 14 June 2013.

OLUFAYO, O. & ABOU-EL-HOSSEIN, K. Preliminary investigation of surface finish of a contact lens polymer in ultra-high precision diamond turning. *Sixth Robotics and Mechatronics Conference*: 30 – 31 October 2013.

OLUFAYO, O.A. & ABOU-EL-HOSSEIN, K. Acoustic emission monitoring in ultra-high precision machining of rapidly solidified aluminium. *International Conference on Competitive Manufacturing*: Stellenbosch, South Africa, 30 January – 01 February 2013.

OZUMBA, A. & SHAKANTU, W. Investigating barriers to ICT adoption in site management: *A pilot study in South Africa*. *RICS Cobra*: New Delhi, India, 10 – 12 September 2013.

POTGIETER, M. & VAN NIEKERK, J. A framework to enable collaborative writing using web-enabled technologies. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

POTGIETER, M.; MARAIS, C. & GERBER, M. Fostering content relevant information security awareness through browser extensions. *IFIP World Conference on Information Security Education*: Auckland, New Zealand, 08 – 10 July 2013.

POTTAS, D. & MOSTERT-PHIPPS, N. Citizens and personal health records – the case of Nelson Mandela Bay. *Medinfo*: Copenhagen, Denmark, 20 – 23 August 2013.

PRETORIUS, S.; DU PREEZ, K.H. & VAN NIEKERK, T.I. Flexible measurement system for modern automobile production. *International Conference on Competitive Manufacturing*: Stellenbosch, South Africa, 30 January – 01 February 2013.

REID, R. & VAN NIEKERK, J. Back to basics: Information security education for the youth via gameplay. *IFIP World Conference on Information Security Education*: Auckland, New Zealand, 08 – 10 July 2013.

REID, R. & VAN NIEKERK, J. Digital pocket money: Catering for the financial needs of the web generation. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

REID, R. & VAN NIEKERK, J. Towards a brain-compatible approach for web-based information security education. *Proceedings of the European Information Security Multi-Conference*: Lisbon, Portugal, 08 – 10 May 2013.

RENAUD, K.; KENNES, D.; VAN NIEKERK, J. & MAGUIRE, J. SNIPPET: Genuine knowledge-based authentication. *2013 Information Security for South Africa*: Johannesburg, South Africa, 14 – 16 August 2013.

RUSSELL, E.; HARRIS, R.; PHIPPS, W. & ROBERTS, A. An investigation into the probabilities of 66kV and 132kV bushing failures and mitigating against the associated risks. *Proceedings of the Twenty-first Southern African Universities Power Engineering Conference*: Potchefstroom, South Africa, 31 January – 01 February 2013.

SANDT, M. & HARRIS, R. Upgrade of the antiquated 3TM2500 transformer scheme to provide improved transformer protection. *Proceedings of the Twenty-first Southern African Universities Power Engineering Conference*: Potchefstroom, South Africa, 31 January – 01 February 2013.

SIMPSON, M.; GORLACH, I.A. & DU PLESSIS, M.C. Enhancing the accuracy of a CNC machine using artificial neural networks. *International Conference on Competitive Manufacturing*: Stellenbosch, South Africa, 30 January – 01 February 2013.

SINGH, P. Usefulness of the collegial leadership model of emancipation to revolutionize bureaucratic management. *World Academy of Science, Engineering and Technology*: Penang, Malaysia, 16 December 2013.

SKOLMEN, D. & GERBER, D. User perceptions regarding internet service providers' assurance of online privacy and confidentiality. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

SMALLWOOD, J. & EMUZE, F. Assessing the contributions of a public sector client to contractor health and safety (H&S) improvement in South Africa. *Second International Conference on Infrastructure Development in Africa*: Johannesburg, South Africa, 17 – 19 March 2013.

SMALLWOOD, J., EMUZE, F. & BLOOMBERG, C. Emotional quotient and managing construction projects. *New Developments in Structural Engineering and Construction*: Honolulu, USA, 18 – 23 June 2013.

TABERER, M.W.; ROBERTS, A.G.; HARRIS, R.T. & PHIPPS, W. Transient analysis of erroneous tripping at Grassridge SVC. *IEEE International Conference on Industrial Technology*: Cape Town, South Africa, 25 – 27 February 2013.

TSCHERSICH, M. & BOTHA, R.A. Understanding the impact of default privacy settings on self-disclosure in social network services. *Nineteenth Americas Conference on Information Systems*: Chicago, USA, 15 – 17 August 2013.

TSOKOTA, T. & VON SOLMS, R. ICT and the turning-around of the Zimbabwean Economy. *ICT4Africa 2013*: Zimbabwe, Harare, 20 – 23 February 2013.

VAN DE HAAR, H.; VAN GREUNEN, D. & POTTAS, D. The characteristics of a biometric. *2013 Information Security for South Africa: Johannesburg, South Africa*, 14 – 16 August 2013.

VAN DEN BERG, A. & SMITH, F. Hardware evolution of a digital circuit using a custom VLSI Architecture. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists: East London, South Africa*, 07 – 09 October 2013.

VAN GREUNEN, D. & VELDSMAN, A. Using technology in living labs to transform access to healthcare information in South Africa. *IST-Africa 2013: Nairobi, Kenya*, 29 – 31 May 2013.

VAN GREUNEN, D. & WILSON, F. User requirements for mobile government in eh Western Cape. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications: Cape Town, South Africa*, 10 – 13 September 2013.

VAN GREUNEN, D. Using ICT as smart enabler of socio economic development. *Seventh International Development Informatics Association Conference: Bangkok, Thailand*, 01 – 03 November 2013.

VAN NIEKERK, J.; THOMSON, K-L. & REID, R. Cyber safety for school children. A case study in the Nelson Mandela Metropolis. *IFIP World Conference on Information Security Education: Auckland, New Zealand*, 08 – 10 July 2013.

VELDSMAN, A. & VAN GREUNEN, D. Challenges and lessons learnt from community interventions – the 'People Side'. *Seventh International Development Informatics Association Conference: Bangkok, Thailand*, 01 – 03 November 2013.

VENTER, C.; HARRIS, R.T.; ROBERTS, A.G. & PHIPPS, W. An investigation into voltage transformers used for tariff metering of medium and high voltage loads and standard guidelines for its application. *IEEE International Conference on Industrial Technology: Cape Town, South Africa*, 25 – 27 February 2013.

VON SCHOULTZ, D.J.; VAN NIEKERK, J. & THOMSON, K. Web usage mining within a South African university infrastructure: Towards useful information from student web usage data. *Proceedings of the Fifteenth Annual Conference on World Wide Web Applications: Cape Town, South Africa*, 10 – 13 September 2013.

WENTZEL, L.; EMUZE, F. & SMALLWOOD, J. Reversing the business failure rate among small and medium size construction firms in South Africa: A progressive study. *West Africa Built Environment Research Conference: Accra, Ghana*, 12 – 14 August 2013.

WIEGAND, W. & SMALLWOOD, J. Knowledge management in construction: South African contractors' perceptions. *Creative Construction Conference 2013: Budapest, Hungary*, 06 – 09 July 2013.

WILLETT, M. & VON SOLMS, R. A framework for assuring the conformance of cloud-based email. *International Conference for Internet Technology and Secured Transactions: London, United Kingdom*, 09 – 12 December 2013.

YERATZIOS, G. & VAN GREUNEN, D. Making ICT accessible for the deaf. *IST-Africa 2013: Nairobi, Kenya*, 29 – 31 May 2013.

■ Faculty of Education

DHET Accredited Journal Articles

BOTHA, M.M. 2013. Engaging with the literature in postgraduate research. *Acta Academica* 45(2), pp. 1 – 26.

GELDENHUYS, J.L.; KRUGER, C. & MOSS, J. 2013. Selected South African Grade 10 Learners' perceptions of two Learning Areas: Mathematical Literacy and Life Orientation. *Africa Education Review* 10(2), pp. 298 – 322.

GELDENHUYS, J.J. & WEVERS, N.E.J. 2013. Ecological aspects influencing the implementation of inclusive education in mainstream primary schools in the Eastern Cape, South Africa. *South African Journal of Education* 33(3), pp. 562 - 579.

JORDAAN, C.A.G. & JORDAAN, D.J. (Jordaan, D.J. Post humous). 2013. The case for formal visual literacy teaching in higher education. *South African Journal of Higher Education* 27(1), pp. 76 – 92.

KHAU, M.C. 2013. Understanding gender, sexuality and HIV risk in HEIs: narratives of international post-graduate students. *The Journal for Transdisciplinary Research in Southern Africa* 9(3), pp. 537 – 549.

KHAU, M.C. 2013. Using participatory and visual arts-based methodologies to promote sustainable teaching and learning ecologies: through the eyes of pre-service teachers. *The Journal for Transdisciplinary Research in Southern Africa* 9(3), pp. 401 – 412.

MAYABA, N.; OTTERUP, T. & WEBB, P. 2013. Writing in Science Classrooms: Some Case Studies in South African and Swedish Second-language Classrooms. *African Journal of Research in Mathematics, Science and Technology Education* 17(1-2), pp. 74 – 82.

MITCHELL, C. & DE LANGE, N. 2013. What can a teacher do with a cellphone? Using participatory visual research to speak back in addressing HIV & AIDS. *South African Journal of Education* 33(4), pp. 1013.

PIENAAR, C.F. & RAYMOND, E.B. 2013. Reflections on a shared leadership approach to curriculum development in higher education. *South African Journal of Higher Education* 27(5), pp. 1290 – 1304.

SINGH, P. 2013. Symbiotic Relationship Between Emotional Intelligence And Collegial Leadership. *International Business & Economics Research Journal* 12(3), pp. 331 – 344.

SINGH, P. 2013. Transforming Traditional Bureaucratic Management Practices By Employing The Collegial Leadership Model Of Emancipation. *International Business & Economics Research Journal* 12(8), pp. 953 – 968.

SINGH, P. 2013. Influence Of The Leaders' Emotionally Intelligent Behaviours On Their Employees' Job Satisfaction. *International Business & Economics Research Journal* 12(7), pp. 799 – 814.

SINGH, P. 2013. A Collegial Approach In Understanding Leadership As A Social Skill. *International Business and Economics Research Journal* 12(5), pp. 489 – 502.

SINGH, P. 2013. Accounting Enrichment Program For Gifted High School Pupils: Self-Regulated Learning Strategies To Develop Our Future Business Leaders. *International Business & Economics Research Journal* 12(1), pp. 103 – 112.

SINGH, P. 2013. Fear Abounds In the Educational Environment: Teachers' Professional Competencies In The Management Of Knowledge. *International Business & Economics Research Journal* 12(6), pp. 667 – 700.

SINGH, P. 2013. Influence Of Leaders' Intrapersonal Competencies On Employee Job Satisfaction. *International Business & Economics Research Journal* 12(10), pp. 1289 – 1302.

SINGH, P. 2013. The Value Of Mentoring To Develop Student Teachers' Work-Integrated Learning Skills. *International Business & Economics Research Journal* 12(11), pp. 1373 – 1388.

SINGH, P. 2013. Why It Matters For Collegial Leaders To Have A Binocular Vision. *International Business & Economics Research Journal* 12(12), pp. 1615 – 1626.

SINGH, P. 2013. Exploring The Collegial Relationship Between Mentors and their Mentees. *International Business & Economics Research Journal* 12(12), pp. 1547-1562.

SINGH, P. 2013. Need for emotional intelligence to develop principals' social skills. *Africa Education Review Journal* 10(3), pp. 502 – 519.

SING, P. & DALI, C.M. 2013. The value of empathy as an instructional leadership competency for school principals. *Education As Change* 17(51), pp. 65 – 78.

VAN LAREN, L.; DE LANGE, N. & TANGA, P. 2013. "Breaking out of the cocoon": academics' experiences of integrating HIV and AIDS into the curriculum". *Acta Academica* 45(3), pp. 291 – 317.

WEBB, P. 2013. Xhosa indigenous knowledge: Stakeholder awareness, value, and choice. *International Journal of Science and Mathematics Education* 11, pp. 89 – 110.

WOOD, L.; DE LANGE, N. & MKUMBO, K. 2013. Drawing AIDS: Tanzanian teachers picture the pandemic. Implications for re-curriculation of teacher education programmes. *Perspectives in Education* 31(2), pp. 1 – 13.

WOOD, L. & GOVENDER, B. 2013. "You learn from going through the process": The perceptions of South African school leaders about action research. *Action Research* 11(2), pp. 176 – 193.

Book submitted to DHET for subsidy purposes

SINGH, P.; MANSER, P. & DALI, C. 2013. *Principal Leadership*. LAP Lambert Academic Publishing: Saarbrücken, Germany.

Book Chapters submitted to DHET for subsidy purposes

BLIGNAUT, S. 2013. Teaching for social justice in South African universities in: DE WET, G. (Ed). *Beyond the Apartheid University: critical voices on transformation in the university sector*. University of Fort Hare Press, Alice, South Africa.

SWANSON, D. 2013. The Owl spreads its wings: Global and international education within the local from critical perspectives in: HERBERT, Y. & ABDI, A. *Critical perspectives in international education*. Sense, Rotterdam, Netherlands.

■ Faculty of Health Sciences

DHET Accredited Journal Articles

ANDERSSON, L.M.C.; SCHIERENBECK, I.; STRUMPHER, J.; KRANTZ, G.; TOPPER, K.; BACKMAN, G.; RICKS, E. & VAN ROOYEN, D. 2013. Help-seeking behavior, barriers to care and experiences of care among persons with depression in Eastern Cape, South Africa. *Journal of Affective Disorders* 151(2), pp. 439 – 448.

BIMROSE, J.; McMAHON, M. & WATSON, M. 2013. Career trajectories of older women: implications for career guidance. *British Journal of Guidance & Counselling* 41(5), pp. 587 – 601.

BURTON, S.; BOSCHMANS, S. & HOELSON, C. 2013. Self-Perceived Professional Identity of Pharmacy Educators in South Africa. *American Journal of Pharmaceutical Education* 77(10), pp. 1 – 8.

CHISANGO, T. & MAYEKISO, T. 2013. An investigation of the sexist application of the morality concept of Tsika in the Shona culture of Zimbabwe. *International Journal of Psychology* 48(6), pp. 1237 – 1245.

CLÜVER, F.; ELKONIN, D. & YOUNG, C. 2013. Experiences of sexual relationships of young black women in an atmosphere of coercion. *Journal of Social Aspects of HIV/AIDS* 10(1), pp. 8 – 16.

McMAHON, M. & WATSON, M. 2013. Story telling: crafting identities. *British Journal of Guidance & Counselling* 41(3), pp. 277 – 286.

RALL, N.; JAMES, S.V. & STRÜMPHER, J. 2013. Pregnant teenagers' experiences of communication at antenatal clinics in South Africa. *Africa Journal of Nursing and Midwifery* 15(2), pp. 144 – 156.

RICKS, E.; VAN ROOYEN, D.; GANTSHO, M.P. & TEN HAM, W. 2013. Experiences of Managers and Healthcare Personnel Involved in a Functional Healthcare Public Private Partnership. *Journal of Psychology in Africa* 23(2), pp. 297 – 302.

SCHIERENBECK, I.; JOHANSSON, P.; ANDERSSON, L.M.C. & VAN ROOYEN, D. 2013. Barriers to accessing and receiving mental health care in Eastern Cape, South Africa. *Health and Human Rights* 15(2), pp. 110 – 123.

Book Chapter submitted to DHET for subsidy purposes

WATSON, M. & McMAHON, M. 2013. Qualitative career assessment in South Africa in: LAHER, S. & COCKCROFT, K. (Eds). *Psychological assessment in South Africa*. Wits University Press, Johannesburg, South Africa.

■ Faculty of Law

DHET Accredited Journal Articles

BADENHORST, P.J. 2013. Expropriation of “unused old order rights” by the MPRDA: You had nothing! Minister of Minerals and Energy v Agri SA (CALS amicus curiae) (458/11) (2012) ZASCA 93 (31 May 2012). *THRHR* 76(3), pp. 468 – 490.

BADENHORST, P.J. 2013. Conversion of “old order mining rights”: Sleeping at the MPRDA’S wheel of (mis)fortune? Sishen Iron Ore Company (Pty) Ltd v Minister of Mineral Resources unreported case no. 28980/10 (GNP). *Tydskrif vir Hedendaagse Romeins-Hollandse Reg/Journal of Contemporary Roman Dutch Law* 76(2), pp. 269 – 284.

BADENHORST, P.J. 2013. Paying the Piper (In Praesentia). Xstrata South Africa (Pty) v SFF Association 2012 (5) SA 60 (SCA). *Obiter* 34(2), pp. 322 – 332,

BOSCH, C. 2013. The Proposed 2012 Amendments Relating to Non-standard Employment: What Will the New Regime Be? *Industrial Law Journal* 34, pp. 1631 – 1644.

CHITIMIRA, H. & LAWACK, V.A. 2013. An analysis of the general enforcement approaches to combat market abuse (Part 2). *Obiter* 34(1), pp. 64 – 76.

CHITIMIRA, H. & LAWACK, V.A. 2013. Overview of the role-players in the investigation, prevention and enforcement of market-abuse provisions in South Africa. *Obiter* 34(2), pp. 200 – 217.

MYBURGH, A. 2013. Big Bucks Little Protection: Section 188B of the Labour Relations Amendment Bill 2012. *Industrial Law Journal* 34, pp. 808 – 822.

NEL, E.; LAWACK, V.A. & VAN DER WALT, A. 2013. The Trust as special-purpose institution. *Obiter* 34(1), pp. 111 – 124.

SCHRAGE, E.J.H. 2013. Liability to disgorge profits upon breach of contract or a delict. *Obiter* 34(1), pp. 17 – 28.

VAN DEN BERG, N.J.C. 2013. Legislative Drafting: Short Titles and Commencement Clauses. *Speculum Juris* 27(2), pp. 59 – 77.

WAGENAAR, T. & MARX, F. 2013. Extension of the Term of Protection for Performers: It’s Just a Question of Time. *Speculum Juris* 27(1), pp. 102 – 129.

Book submitted to DHET for subsidy purposes

OLIVIER, M.P., GOVINDJEE, A., NYENTI, M., MOHAMMED, M.A. & HUANG, E. 2012. *Sasco Return-to-work Programme in Malaysia*.

Book Chapters submitted to DHET for subsidy purposes

GOVINDJEE, A.; OLIVIER, M.P. & NYENTI, M. 2013. The role of international and regional standards in the development of an appropriate rehabilitation, reintegration and return-to-work policy framework in South Africa in: OLIVIER, M., DUPPER, O. & GOVINDJEE, A. (Eds). *The role of standards in labour and social security law: International, regional and national perspectives*. JUTA, Cape Town, South Africa.

OLIVIER, M.; DUPPER, O. & GOVINDJEE, A. 2013. Enhancing the protection of transnational migrant workers: A critical evaluation of regulatory techniques in ALES, E. & SENATORI, I. (Eds). *The transnational dimension of labour relations: A new order in the making?* G GIAPPICHELLI publishers, Torino, Italy.

NYENTI, M., OLIVIER, M. & GOVINDJEE, A. 2013. Reforming the South African social security adjudication system in: OLIVIER, M., DUPPER, O. & GOVINDJEE, A. (Eds). *The role of standards in labour and social security law: International, regional and national perspectives*. JUTA, Cape Town, South Africa.

GOVINDJEE, A. & TAIWO, E.A. 2013. The protection of women refugees under the international refugee convention in: ISLAM, R. & BHUIYAN, J.H. (Eds). *An introduction to international refugee law*. Martinus Nijhoff Publishers, Leiden, Netherlands.

GOVINDJEE, A. Road Accidents in: JOUBERT, W.A. & FARIS, J.A. (Eds). *Social Security: Core elements*. LexisNexis, Durban, South Africa.

GOVINDJEE, A. Disability in: JOUBERT, W.A. & FARIS, J.A. (Eds). *Social Security: Core elements*. LexisNexis, Durban, South Africa.

GOVINDJEE, A. Children and family in: JOUBERT, W.A. & FARIS, J.A. (Eds). *Social Security: Core elements*. LexisNexis, Durban, South Africa.

■ Faculty of Science

DHET Accredited Journal Articles

AGARWAL, S.; LEFFERTS, L.; MOJET, B.L.; LIGTHART, D.A.J.M.; HENSEN, E.J.M.; MITCHELL, D.R.G.; ERASMUS, W.J.; ANDERSON, B.G.; OLIVIER, E.J.; NEETHLING, J.H. & DATYE, A.K. 2013. Exposed Surfaces on Shape-Controlled Ceria Nanoparticles Revealed through AC-TEM and Water-Gas Shift Reactivity. *ChemSusChem* 6(10), pp. 1898 – 1906.

AMBROSE, S.T.; FRONEMAN, P.W.; SMALE, M.J.; CLIFF, G. & PLÖN, S. 2013. Winter diet shift of long-beaked common dolphins (*Delphinus capensis*) feeding in the sardine run off KwaZulu-Natal, South Africa. *Marine Biology* 160(7), pp. 1543 – 1561.

BARENDSE, J.; BEST, P.B.; CARVALHO, I. & POMILLA, C. 2013. Mother Knows Best: Occurrence and Associations of Resighted Humpback Whales Suggest Maternally Derived Fidelity to a Southern Hemisphere Coastal Feeding Ground. *PLOS ONE* 8(12), pp. 1 – 14.

BARTON, B.; CAIRA, M.R.; HOSTEN, E.C. & McCLELAND, C.W. 2013. A computational X-ray crystallographic and thermal stability analysis of TETROL and its pyridine and methylpyridine inclusion complexes. *Tetrahedron* 69(41), pp. 8713 – 8723.

BATES, M.F.; TOLLEY, K.A.; EDWARDS, S.; DAVIDS, Z.; DA SILVA, J.M. & BRANCH, W.R. 2013. A molecular phylogeny of the African plated lizards, genus *Gerrhosaurus* Wiegmann, 1828 (Squamata: Gerrhosauridae), with the description of two new genera. *Zootaxa* 3750(5), pp. 465 – 493.

- BAYLIS, A.M.M.; WOLFAARDT, A.C.; CROFTS, S.; PISTORIUS, P.A. & RATCLIFFE, N.** 2013. Increasing trend in the number of Southern Rockhopper Penguins (*Eudyptes c. chrysocome*) breeding at the Falkland Islands. *Polar Biology* 36(7), pp. 1007 – 1018.
- BENECKE, M.A.; VAN DYK, E.E. & VORSTER, F.J.** 2013. Optical design of low concentrator photovoltaic modules. *Journal of Energy in Southern Africa* 24(1), pp. 46 – 50.
- BERNARD, A.T.F.; GÖTZ, A.; KERWATH, S.E. & WILKE, C.G.** 2013. Observer bias and detection probability in underwater visual census of fish assemblages measured with independent double-observers. *Journal of Experimental Marine Biology and Ecology* 443, pp. 75 – 84.
- BIRD, M.S.; MLAMBO, M.C. & DAY, J.A.** 2013. Macroinvertebrates as unreliable indicators of human disturbance in temporary depression wetlands of the south-western Cape, South Africa. *Hydrobiologia* 720(1), pp. 19 – 37.
- BIRD, M.S. & DAY, J.A.** 2013. Wetlands in Changed Landscapes: The Influence of Habitat Transformation on the Physico-Chemistry of Temporary Depression Wetlands. *PLOS ONE* 9(2), pp. 1 – 13.
- BLIGNAUT, J.; ESLER, K.J.; DE WIT, M.P.; LE MAITRE, D.; MILTON, S.J. & ARONSON, J.** 2013. Establishing the links between economic development and the restoration of natural capital. *SciVerse Science Direct* 5, pp. 94 – 101.
- BORMAN, G.D.; VON MALTITZ, G.P.; TIWARI, S. & SCHOLES, M.C.** 2013. Modelling the economic returns to labour for *Jatropha* cultivation in southern Africa and India at different local fuel prices. *SciVerse ScienceDirect* 59, pp. 70 – 83.
- BROMLEY, C.L.; PARKER-NANCE, S.; DE LA MARE, J.; EDKINS, A.L.; BEUKES, D.R. & DAVIES-COLEMAN, M.T.** 2013. Halogenated Oxindole and Indoles from the South African Marine Ascidian *Distaplia skoogi*. *South African Journal of Chemistry* 66, pp. 64 – 68.
- BUDZIK, K.A.; ZUWATA, K. & MEASEY, G.J.** 2013. The occurrence of taste buds in adults of the terrestrial caecilian *Boulengerula boulengeri* Tornier, 1898 (Lissamphibia: Gymnophiona: Herpidae). *African Zoology* 48(2), pp. 407 – 411.
- BURKEPEIL, D.E.; BURNS, C.E.; TAMBLING, C.J.; AMENDOLA, E.; BUIS, G.M.; GOVENDER, N.; NELSON, V.; THOMPSON, D.I.; ZINN, A.D. & SMITH, M.D.** 2013. Habitat selection by large herbivores in a southern African savanna: the relative roles of bottom-up and top-down forces. *Ecosphere* 4(11), pp. 1 – 19.
- CHAPPLE, S.; ANANDJIWALA, R. & RAY, S.S.** 2013. Mechanical, thermal and fire properties of polylactide/starch blend/clay composites. *Journal of Thermal Analysis and Calorimetry* 113(2), pp. 703 – 712.
- CHRISTOPHER, A.J.** 2013. The commonwealth censuses: partial insights into issues of identity. *Commonwealth & Comparative Politics* 51(3), pp. 326 – 342.
- CILLIERS, P.; BIGGS, H.C.; BLIGNAUT, S.; CHOLE, A.G.; HOFMEYER, J.S.; JEWITT, G.P.W. & ROUX, D.J.** 2013. Complexity, Modeling, and Natural Resource Management. *Ecology and Society* 18(3), pp. 1 – 12.
- COETSEE, C.; GRAY, E.F.; WAKELING, J.; WIGLEY, B.J. AND BOND, W.J.** 2013. Low gains in ecosystem carbon with woody plant encroachment in a South African savanna. *Journal of Tropical Ecology* 29(01), pp. 49 – 60.
- COETZEE, C. & WIGLEY, B.J.** 2013. *Virgilia divaricata* may facilitate forest expansion in the afrotemperate forests of the southern Cape, South Africa. *Koedoe* 55(1), pp. 49 – 56.
- CONRADIE, W.; BRANCH, W.R. & TOLLEY, K.A.** 2013. Fifty shades of Grey: Giving colour to the poorly known Angolan Ashy reed frog (*Hyperoliidae*: *Hyperolius cinereus*), with the description of a new species. *Zootaxa* 3635(3), pp. 201 – 223.
- CRAWFORD, R.J.M.; RANDALL, R.M.; WHITTINGTON, P.A.; WALLER, L.; DYER, B.M.; ALLAN, D.G.; FOX, C.; MARTIN, A.P.; UPFOLD, L.; VISAGIE, J.; NACJPP, S.; BOWKER, M.; DOWNS, C.T.; FPX, R.; HUISAMEN, J.; MAKHADO, A.B.; OOSTHUIZEN, W.H.; RYAN, P.G.; TAYLOR, R.H. & TURPIE, J.K.** 2013. South Africa's coastal-breeding white-breasted cormorants: population trends, breeding season and movements, and diet. *African Journal of Marine Science* 35(4), pp. 473 – 490.
- CROMSIGT, J.P.G.M.; KUIJPER, D.P.J.; ADAM, M.; BESCHTA, R.L.; CHURSKI, M.; EYCOTT, A.; KERLEY, G.I.H.; MYSTERUD, A.; SCHMIDT, K. & WEST, K.** Hunting for fear: innovating management of human-wildlife conflicts. *Journal of Applied Ecology* 50(3), pp. 544 – 549.
- CROUCH, N.R.; SMITH, G.F. & FIGUEIREDO, E.** 2013. From checklists to an e-flora for Southern Africa: Past experiences and future prospects for meeting target 1 of the 2020 Global Strategy for Plant Conservation. *Annals of the Missouri Botanical Garden* 99, pp. 153 – 160.
- DALLAS, H.F.** 2013. Ecological status assessment in Mediterranean rivers: complexities and challenges in developing tools for assessing ecological status and defining reference conditions. *Hydrobiologia* 719(1), pp. 483 – 507.
- DALY, R.; FRONEMAN, P.W. & SMALE, M.** 2013. Comparative Feeding Ecology of Bull Sharks (*Carcharhinus leucas*) in the Coastal Waters of the Southwest Indian Ocean Inferred from Stable Isotope Analysis. *PLoS ONE* 8(10), pp. 1 – 11.
- DALY, R. & SMALE, M.J.** 2013. Evaluation of an underwater biopsy probe for collecting tissue samples from bull sharks *Carcharhinus leucas*. *African Journal of Marine Science* 35(1), pp. 129 – 132.
- DAYANANDA, A.S.; YATHIRAJAN, H.S.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the crystal structure of (1R,2S)-2-((dimethylphenyl)-carbamoyl)-1-propylpiperidin-1-ium chloride monohydrate, C₁₇H₂₉N₂O₂. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 239 – 240.
- DAYANANDA, A.S.; YATHIRAJAN, H.S.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of 7-chloro-1,3-dihydro-1-methyl-5-phenyl-1,4-benzodiazepin-2(3H)-one, C₁₆H₁₃N₂O. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 223 – 224.
- DDUMBA, H.; MUGISHA, J.Y.T.; GONSALVES, J.W. & KERLEY, G.I.H.** 2013. Periodicity and limit cycle perturbation analysis of a predator-prey model with interspecific species' interference, predator additional food and dispersal. *Applied Mathematics and Computation* 219(15), pp. 8338 – 8357.

- DECKER, J.E.; NIEDERMANN, S. & DE WIT, M.J.** 2013. Climatically influenced denudation rates of the southern African plateau: Clues to solving a geomorphic paradox. *Geomorphology* 190, pp. 48 – 60.
- DEFEO, O. & MCLACHLAN, A.** 2013. Global patterns in sandy beach macrofauna: Species richness, abundance, biomass and body size. *Geomorphology* 199, pp. 106 – 114.
- DE WIT, M. & FURNES, H.** 2013. Earth's oldest preserved unconformity – Prospect of a beginning in the tectono-sedimentary continental cycle? *Gondwana Research* 23(2), pp. 429 – 435.
- DICKEN, M.L.; SMALE, M.J. & BOOTH, A.J.** 2013. White sharks *Carcharodon carcharias* at Bird Island, Algoa Bay, South Africa. *African Journal of Marine Science* 35(2), pp. 175 – 182.
- DICKEN, M.L.; BRADSHAW, M. & SMALE, M.J.** 2013. White shark (*Carcharodon carcharias*)- inflicted bite wounds observed on Cape fur seals (*Arctocephalus pusillus pusillus*) at Black Rocks, Algoa Bay, South Africa. *African Zoology* 48(2), pp. 418 – 426.
- DONALDSON, R.; MEHLOMAKHULU, T.; DARKEY, D.; DYSEL, M. & SIYONGWANA, P.** 2013. Relocation: To be or not to be a black diamond in a South African township? *Habitat International* 39, pp. 114 – 118.
- DU PLESSIS, M.C. & ENGELBRECHT, A.P.** 2013. Differential evolution for dynamic environments with unknown numbers of optima. *Journal of Global Optimization* 55(1), pp. 73 – 99.
- FERG, E.; ROSSOUW, C. & LOYSON, P.** 2013. The testing of batteries linked to supercapacitors with electrochemical impedance spectroscopy: A comparison between Li-ion and valve regulated lead acid batteries. *Journal of Power Sources* 226, pp. 299 – 305.
- FERG, E. & BOLO, L.L.** 2013. A correlation between the variable melt flow index and the molecular mass distribution of virgin and recycled polypropylene used in the manufacturing of battery cases. *Polymer Testing* 32(8), pp. 1452 – 1459.
- FERG, E.E. & SIMPSON, B.** 2013. Using PXRD and PONKCS to Determine the Kinetics of Crystallisation of Highly Concentrated NH₄NO₃ Emulsions. *Journal of Chemical Crystallography* 43, pp. 197 – 206.
- FIGUEIREDO, E. & SMITH, G.F.** 2013. (2199) Proposal to conserve the name *Agave Xleopoldii* W. Watson against *A. leopoldii* Rafarin (Agavaceae/Asparagaceae). *Taxon* 62(5), pp. 1061 – 1061.
- FIGUEIREDO, E.; SMITH, G.F. & PAIVA, J.** 2013. A checklist of *Polygala* (Polygalaceae) in the Flora of Southern Africa region with notes on types. *Phytotaxa* 155(1), pp. 1 – 22.
- FIGUEIREDO, E. & SMITH, G.F.** 2013. (2200) Proposal to conserve the name *Littaea geminiflora* (Agave *geminiflora*) against *Yucca bosicii* (Agavaceae/Asparagaceae). *Taxon* 62(5), pp. 1062 – 1062.
- FIGUEIREDO, E.; PAIVA, J. & SMITH, G.F.** 2013. Typification of two Linnaean names in *Polygala* (Polygalaceae): *P. bracteolata* and *P. myrtifolia*. *Taxon* 62(4), pp. 807 – 808.
- FIGUEIREDO, E.; SMITH, G.F. & NYFFELER, R.** 2013. August Wulffhorst (1861-1936) and his overlooked contributions on the flora of Angola. *Candollea* 68(1), pp. 123 – 131.
- FRITZ, U.; BRANCH, W.R.; GEHRING, P.; HARVEY, J.; KINDLER, C.; MEYER, L.; DU PREEZ, L.; IROKÝ, P.; VIEITES, D.R. & VENCES, M.** 2013. Weak divergence among African, Malagasy and Seychellois hinged terrapins (*Pelusios castanoides*, *P. subniger*) and evidence for human-mediated overseas dispersal. *Organisms, Diversity and Evolution* 13(2), pp. 215 – 224.
- FURNS, H.; DE WIT, M. & ROBINS, B.** 2013. A review of new interpretations of the tectonostratigraphy, geochemistry and evolution of the Onverwacht Suite, Barberton Greenstone Belt, South Africa. *Gondwana Research* 23(2), pp. 403 – 428.
- GERBER, T. & BETZ, R.** 2013. Crystal structure of ammonium 5-carboxypicolinate monohydrate, C₇H₁₀N₂O₅. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 237 – 238.
- GERBER, J.D.; BENECKE, M.A.; VORSTER, F.J. & VAN DYK, E.E.** 2013. Thermal modelling of low concentrator photovoltaic systems. *Journal of Energy in Southern Africa* 24(1), pp. 51 – 55.
- GERBER, T. & BETZ, R.** 2013. Crystal structure of ammonium 5-carboxypicolinate monohydrate, C₇H₁₀N₂O₅. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 237 – 238.
- GRACE, O.M.; KLOPPER, R.R.; SMITH, G.F.; CROUCH, N.R.; FIGUEIREDO, E.; RONSTED, N. & VAN WYK, A.E.** 2013. A revised generic classification for *Aloe* (Xanthorrhoeaceae subfam. Asphodeloideae). *Phytotaxa* 76(1), pp. 7 – 14.
- GROENEWALD, N.J. & SSEVVIIRI, D.** 2013. 2-Primal Modules. *Journal of Algebra and Its Applications* 12(5), pp. 1012.
- GROOFF, D.; FRANCIS, F.; DE VILLIERS, M.M. & FERG, E.** 2013. Photostability of Crystalline Versus Amorphous Nifedipine and Nimodipine. *Journal of Pharmaceutical Sciences* 102(6), pp. 1883 – 1894.
- HERRMANN, H.-W. & BRANCH, W.R.** 2013. Fifty years of herpetological research in the Namib Desert and Namibia with an updated and annotated species checklist. *Journal of Arid Environments* 93, pp. 94 – 115.
- HOPPE-SPEER, S.C.L.; ADAMS, J.B. & RAJKARAN, A.** 2013. Response of mangroves to drought and non-tidal conditions in St Lucia Estuary, South Africa. *African Journal of Aquatic Science* 38(2), pp. 153 – 162.
- HRABAR, H. & KERLEY, G.I.H.** 2013. Conservation goals for the Cape mountain zebra *Equus zebra zebra* – security in numbers? *Oryx* 47(3), pp. 403 – 409.
- HUNTER, L.; SMUTS, S. & BOTHA, A.F.** 2013. Characterizing Visually Objectionable and Nonobjectionable Medullated Fibers in Mohair. *Journal of Natural Fibers* 10(2), pp. 112 – 135.

- IBRAHIM, B.; SOWEMIMO, A.; SPIES, L.; KOEKEMOER, T.; VAN DE VENTER, M. & ODUKOYA, O.A.** 2013. Antiproliferative and apoptosis inducing activity of Markhamia tomentosa leaf extract on HeLa cells. *Journal of Ethnopharmacology* 149(3), pp. 745 – 749.
- ISLOR, A.M.; VIJESH, A.M.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of 9,10-dibromoanthracene, C₁₄H₈Br₂. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 23 – 24.
- ISLOR, A.M.; GARUDACHARI, B.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of 1,4-diethoxybenzene, C₁₀H₁₄O₂. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 215 – 216.
- ISLOR, A.M.; CHANDRAKANTHA, B.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of 4-amino-benzonitrile, C₇H₆N₂. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 217 – 218.
- JABEEN, A.; MIRANDA-SAYAGO, J.M.; OBARA, B.; SPENCER, P.S.; DEALTRY, G.B.; HAYRABEDYAN, S.; SHAIKLY, V.; LAISSUE, P.P. & FERNÁNDEZ, N.** 2013. Quantified Colocalization Reveals Heterotypic Histocompatibility Class I Antigen Associations on Trophoblast Cell Membranes: Relevance of Human Pregnancy. *Biology of Reproduction* 89(4), pp. 94 – 104.
- JAMES, N.C.; VAN NIEKERK, L.; WHITFIELD, A.K.; POTTS, W.M.; GÖTZ, A. & PATERSON, A.W.** 2013. Effects of climate change on South African estuaries and associated fish species. *Climate Research* 57(3), pp. 233 – 248.
- JANSE VAN VUUREN, A.; SKURATOV, V.A.; UGLOV, V.V.; NEETHLING, J.H. & ZLOTSKI, S.V.** 2013. Radiation tolerance of nanostructured Zn coatings against swift heavy ion irradiation. *Journal of Nuclear Materials* 443(1-3), pp. 507 – 511.
- JOHN, M.J.; ANANDJIWALA, R.; OKSMAN, K. & MATHEW, A.P.** 2013. Melt-Spun Polylactic Acid Fibers: Effect of Cellulose Nanowhiskers on Processing and Properties. *Journal of Applied Polymer Science* 127(1), pp. 274 – 281.
- KAUR, M.; YATHIRAJAN, H.S.; DAYANANDA, A.S.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of 1-(4-benzyloxyphenyl)-2-bromo-propan-1-one, C₁₆H₁₅BrO₂. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 115 – 116.
- KERWATH, S.E.; WILKE, C.G. & GÖTZ, A.** 2013. The effects of barotrauma on five species of South African line-caught fish. *African Journal of Marine Science* 35(2), pp. 243 – 252.
- KILIAN, G.; DAVIDS, H. & MILNE, P.J.** 2013. Anticancer activity of the liposome-encapsulated cyclic dipeptides, cyclo(His-Gly) and cyclo(His-Ala). *Pharmazie* 68(3), pp. 207 – 211.
- KOAO, L.F.; DEJENE, F.B.; SWART, H.C. & BOTHA, J.R.** 2013. The effect of Ce³⁺ on structure, morphology and optical properties of flower-like ZnO synthesized using the chemical bath method. *Journal of Luminescence* 143, pp. 463 – 468.
- KRAAIJ, T.; COWLING, R.M. & VAN WILGEN, B.W.** 2013. Lightning and fire weather in eastern coastal fynbos shrublands: seasonality and long-term trends. *International Journal of Wildland Fire* 22(3), pp. 288 – 295.
- KRAAIJ, T.; COWLING, R.M. & VAN WILGEN, B.W.** 2013. Fire regimes in eastern coastal fynbos: Imperatives and thresholds in managing for diversity. *Koedoe* 55(1), pp. 1 – 9.
- KRAAIJ, T.; BAARD, J.A.; COWLING, R.M.; VAN WILGEN, B.W. & DAS, S.** 2013. Historical fire regimes in a poorly understood, fire-prone ecosystem: eastern coastal fynbos. *International Journal of Wildland Fire* 22(3), pp. 288 – 295.
- KUMAR, R. & ANANDJIWALA, R.** 2013. Compression-moulded flax fabric-reinforced polyfurfuryl alcohol bio-composites. *Journal of Thermal Analysis and Calorimetry* 112(2), pp. 755 – 760.
- KUMAR, R.; OFOSU, O. & ANANDJIWALA, R.D.** 2013. Macadamia Nutshell Powder Filled Poly Lactic Acid Composites with Triacetin as a Plasticizer. *Journal of Biobased Materials and Bioenergy* 7(5), pp. 541 – 548.
- LOARIE, S.R.; TAMBUNG, C.J. & ASNER, G.P.** 2013. Lion hunting behavior and vegetation structure in an African savanna. *Animal Behaviour* 85(5), pp. 899 – 906.
- LANDMAN, M.; SCHOEMAN, D.S. & KERLEY, G.I.H.** 2013. Shift in Black Rhinoceros Diet in the Presence of Elephant: Evidence for Competition? *PLOS ONE* 8(7), pp. e69771 – e69771.
- MAGWA, N.P.; HOSTEN, E.; WATKINS, G.M. & TSHENTU, Z.R.** 2013. The coordination and extractive chemistry of the later 3d transition metals with bis(1R-benzimidazol-2-yl)methyl sulfide. *Journal of Coordination Chemistry* 66(1), pp. 114 – 125.
- MARRA, L.; FUSILLO, V.; WILES, C.; ZIZZARI, A.; WATTS, P.; RINALDI, R. & ARIMA, V.** 2013. Sol-Gel Catalysts as an Efficient Tool for the Kumada-Corriu Reaction in Continuous Flow. *Science of Advanced Materials* 5, pp. 475 – 483.
- MCCONNACHIE, M.M.; COWLING, R.M.; SHACKLETON, C.M. & KNIGHT, A.T.** 2013. The Challenges of Alleviating Poverty through Ecological Restoration: Insights from South Africa's "Working with Water" Program. *Restoration Ecology* 21(5), pp. 544 – 550.
- MEAD, A.; GRIFFITHS, C.L.; BRANCH, G.M.; McQUAID, C.D.; BLAMEY, L.K.; BOLTON, J.J.; ANDERSON, R.J.; DUFOIS, F.; ROUAULT, M.; FRONEMAN, P.W.; WHITFIELD, A.K.; HARRIS, L.R.; NEL, R.; PILLAY, D. & ADAMS, J.B.** 2013. Human-mediated drivers of change - impacts on coastal ecosystems and marine biota of South Africa. *African Journal of Marine Science* 35(3), pp. 403 – 425.
- MEASEY, G.J. & TOLLEY, K.A.** 2013. A molecular phylogeny for sub-Saharan amphisbaenians. *African Journal of Herpetology* 62(2), pp. 100 – 108.
- MIYA, S.S.; WAGENER, V. & BOTHA, J.R.** 2013. AP-MOVPE GaInSb: Influence of V/III ratio on quality and indium incorporation. *Journal of Crystal Growth* 370, pp. 177 – 181.
- MORETTO, P. & PERISSINOTTO, R.** 2013. Description and ecology of two new species of Gyronotus van Langsberge, 1874 (Coleoptera, Scarabaeidae) from southern Africa. *ZooKeys* 344, pp. 73 – 82.
- MOYO, D. & ANANDJIWALA, R.** 2013. Studies on waterjet impact forces in the hydroentanglement process. *Textile Research Journal* 83(16), pp. 1717 – 1727.

- MÜNCH, Z.; CONRAD, J.E.C.; GIBSON, L.A.; PALMER, A.R. & HUGHES, D. 2013. Satellite earth observation as a tool to conceptualize hydrogeological fluxes in the Sandveld, South Africa. *Hydrogeology Journal* 21(5), pp. 1053 – 1070.
- MUSARA, V.; IREETA, W.T.; WU, L. & LEITCH, A.W.R. 2013. Polarization dependent loss complications on polarization mode dispersion emulation. *Optik* 124, pp. 3774 – 3776.
- NEL, R.; PUNT, A.E. & HUGHES, G.R. 2013. Are Coastal Protected Areas Always Effective in Achieving Population Recovery for Nesting Sea Turtles?. *PLoS ONE* 8(5), pp. e63525 – e63537.
- NEL, H.A.; PERISSINOTTO, R. & TAYLOR, R.H. 2013. In situ growth rate of *Solen cylindraceus* (Mollusca: Euheterodonta: Solenidae) in the St Lucia estuarine lake, South Africa. *African Zoology* 48(2), pp. 266 – 273.
- NOWACK, J.; MZILIKAZI, N. & DAUSMANN, K.H. 2013. Torpor as an emergency solution in *Galago moholi*: heterothermy is triggered by different constraints. *Journal of Comparative Physiology B* 183, pp. 547 – 556.
- NOWACK, J.; WIPPICH, M.; MZILIKAZI, N. & DAUSMANN, K.H. 2013. Surviving the Cold, Dry Period in Africa: Behavioral Adjustments as an Alternative to Heterothermy in the African Lesser Bushbaby (*Galago moholi*). *International Journal of Primatology* 34(1), pp. 49 – 64.
- O'CONNELL, J.H. & NEETHLING, J.H. 2013. Ag transport in high temperature neutron irradiated 3C-SiC. *Journal of Nuclear Materials* 445(1-3), pp. 20 – 25.
- ONWUDIWE, D.; STRYDOM, C. & HOSTEN, E. 2013. Effect of methyl substituent in pyridine on the spectral and thermal properties of pyridyl adducts of Zn(II) and Cd(II) dithiocarbamate. *Inorganica Chimica Acta* 401, pp. 1 – 10.
- OYEDEMI, S.; KOEKEMOER, T.; BRADLEY, G.; VAN DE VENTER, M. & AFOLAYAN, A. 2013. In vitro anti-hyperglycemia properties of the aqueous stem bark extract from *Strychnos henningsii* (Gilg). *International Journal of Diabetes in Developing Countries* 33(2), pp. 120 – 127.
- PAIVA, J.; FIGUEIREDO, E. & SMITH, G.F. 2013. *Polygala retiefiana* (Polygalaceae), a new species described from South Africa. *Phytotaxa* 117(1), pp. 3 – 4.
- PALMER, A.R. & BENNETT, J. 2013. Degradation of communal rangelands in South Africa: towards an improved understanding to inform policy. *African Journal of Range & Forage Science* 30(1+2), pp. 57 – 63.
- PARMESAN, C.; BURROWS, M.T.; DUARTE, C.M.; POLOCANSKA, E.S.; RICHARDSON, A. J.; SCHOEMAN, D.S. & SINGER, M.C. 2013. Beyond climate change attribution in conservation and ecological research. *Ecology Letters* 16(S1), pp. 58 – 71.
- PASQUINI, L.; COWLING, R.M. & ZIERVOGEL, G. 2013. Facing the heat: Barriers to mainstreaming climate change adaptation in local government in the Western Cape Province, South Africa. *Habitat International* 40, pp. 225 – 232.
- PATRICK, P.; STRYDOM, N.A. & GOSCHEN, W.S. 2013. Shallow-water, nearshore current dynamics in Algoa Bay, South Africa, with notes on the implications for larval fish dispersal. *African Journal of Marine Science* 35(2), pp. 269 – 282.
- PEIGNEUR, S.; VAN DER HAEGEN, A.; MÖLLER, C.; WAELEKENS, E.; DIEGO-GARCÍA, E.; MARÌ, F.; NAUDÉ, R. & TYTGAT, J. 2013. Unraveling the peptidome of the South African cone snails *Conus pictus* and *Conus natalis*. *Peptides* 41, pp. 8 – 16.
- PERISSINOTTO, R. & OROZCO, J. 2013. *Eudicella trimeni* Janson, 1884 (Coleoptera: Scarabaeidae: Cetoniinae: Goliathini): Description of larva with notes on conservation status, biology and taxonomy. *African Invertebrates* 54(2), pp. 417 – 426.
- PILLAY, D. & PERISSINOTTO, R. 2013. Benthic macrofauna of an estuarine lake during a drought: spatio-temporal drivers under different hydrological states. *Marine Ecology Progress Series* 492, pp. 111 – 123.
- PORNIK, D.M.; TRAVERS, S.L.; BAUER, A.M. & BRANCH, W.R. 2013. A new species of *Lygodactylus* (Squamata: Gekkonidae) endemic to Mount Namuli, an isolated “sky island” of northern Mozambique. *Zootaxa* 3710(5), pp. 415 – 435.
- POTTS, A.J.; HEDDERSON, T.A.; VLOK, J.H.J. & COWLING, R.M. 2013. Pleistocene range dynamics in the eastern Greater Cape Floristic Region: A case study of the Little Karoo endemic *Berkheya cuneata* (Asteraceae). *South African Journal of Botany* 88, pp. 401 – 413.
- POTTS, A.J.; HEDDERSON, T.A.; FRANKLIN, J. & COWLING, R.M. 2013. The Last Glacial Maximum distribution of South African subtropical thicket inferred from community distribution modelling. *Journal of Biogeography* 40(2), pp. 310 – 322.
- POTTS, A.J.; HEDDERSON, T.A. & COWLING, R.M. 2013. Testing large-scale conservation corridors designed for patterns and processes: comparative phylogeography of three tree species. *Diversity and Distributions* 19(11), pp. 1418 – 1428.
- PRETORIUS, C.J.; DU PLESSIS, M.C. & CILLIERS, C.B. 2013. Simulating Robots Without Conventional Physics: A Neural Network Approach. *Journal of Intelligent & Robotic Systems* 71(3-4), pp. 319-348.
- PYŠEK, P.; HULME, P.E.; MEYERSON, L.A.; SMITH, G.F.; BOATWRIGHT, J.S.; CROUCH, N.R.; FIGUEIREDO, E.; FOXCROFT, L.C.; JAROŠÍK, V.; RICHARDSON, D.M.; SUDA, J. & WILSON, J.R.U. 2013. Hitting the right target: taxonomic challenges for, and of, plant invasions. *AoB Plants* 5, pp. 1 – 25.
- QUISTHOUDT, K.; ADAMS, J.; RAJKARAN, A.; DAHDOUN-GUEBAS, F.; KOEDAM, N. & RANDIN, C.F. 2013. Disentangling the effects of global climate and regional land-use change on the current and future distribution of mangroves in South Africa. *Biodiversity & Conservation* 22(6), pp. 1369 – 1390.
- RAMANTSWANA, M.; MCEWAN, A. & STEENKAMP, J. 2013. A comparison between excavator-based harvester productivity in coppiced and planted *Eucalyptus grandis* compartments in KwaZulu-Natal, South Africa. *Southern Forests* 75(4), pp. 239 – 246.
- RIVERS-MOORE, N.A.; DALLAS, H.F. & MORRIS, C. 2013. Towards setting environmental water temperature guidelines: A South African example. *Journal of Environmental Management* 128, pp. 380 – 392.

- RIVERS-MOORE, N.A.; DALLAS, H.F. & ROSS-GILLESPIE, V.** 2013. Life history does matter in assessing potential ecological impacts of thermal changes on aquatic macroinvertebrates. *River Research and Applications* 29(9), pp. 1100 – 1109.
- RYAN, P.G.; DYER, B.M.; MARTIN, A.P.; WARD, V.L.; WHITTINGTON, P.A. & WILLIAMS, A.J.** 2013. Supernormal clutches in southern African Kelp Gulls *Larus dominicanus* vetula. *Ostrich* 84(2), pp. 157 – 160.
- SAMSHUDDIN, S.; NARAYANA, B.; YATHIRAJAN, H.S.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of 3-methyl-1,5-diphenyl-4,5-dihydro-1H-pyrazole, C₁₆H₁₆N₂. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 207 – 208.
- SARONJINI, B.K.; NARAYANA, B.; YATHIRAJAN, H.S.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the crystal structure of N-acetyl glycine (2-acet-amidoacetic acid), C₄H₇NO₃. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 245 – 246.
- SCHARF, T.E.; CODILEAN, A.T.; DE WIT, M.; JANSEN, J.D. & KUBIK, P.W.** 2013. Strong rocks sustain ancient postorogenic topography. *Geology* 41(3), pp. 331 – 334.
- SCHNABLEGGER, G.E.; VENABLES, L.; KOEKEMOER, T.C.; SOWEMIMO, A.A. & VAN DE VENTER, M.** 2013. Cyathula prostrata ethanol extract activates the extrinsic pathway of apoptosis in HeLa and U937 cell lines. *South African Journal of Botany* 88, pp. 380 – 387.
- SCHOLTZ, B.; CALITZ, A. & CILLIERS, C.** 2013. Usability Evaluation of a Medium-sized ERP System in Higher Education. *Electronic Journal Information Systems Evaluation* 16(2), pp. 86 – 99.
- SCHREINER, C.; RÖDDER, D. & MEASEY, G.J.** 2013. Using modern models to test Poynton's predictions. *African Journal of Herpetology* 62(1), pp. 49 – 62.
- SCHUMANN, E.H.** 2013. Sea level variability in South African estuaries. *South African Journal of Science* 109(3/4), pp. 22 – 28.
- SIDDEGOWDA, M.S.; YATHIRAJAN, H.S.; NARAYANA, B.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of 4'-(bromomethyl)-[1,1'-biphenyl]-2-carbonitrile, C₁₄H₁₀BrN. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 203 – 204.
- SIMMONS, M.; WILES, C.; ROCHER, V.; FRANCESCONI, M.G. & WATTS, P.** 2013. The Preparation of Magnetic Iron Oxide Nanoparticles in Microreactors. *Journal of Flow Chemistry* 3(1), pp. 7 – 10.
- SKURATOV, V.A.; UGLOV, V.V.; O'CONNELL, J.; SOHATSKY, A.S.; NEETHLING, J.H. & ROGOZHNIKIN, S.V.** 2013. Radiation stability of the ODS alloys against swift heavy ion impact. *Journal of Nuclear Materials* 422(1-3), pp. 449 – 457.
- SIYONGWANA, P. & SIHAWU, V.** 2013. Housing Transformation in Port St Johns, South Africa Since 1994. *Journal of Human Ecology* 44(1), pp. 75 – 84.
- SMIT, A.J.; ROBERTS, M.; ANDERSON, R.J.; DUFOIS, F.; DUDLEY, S.F.J.; BORNMAN, T.G.; OLBERS, J. & BOLTON, J.J.** 2013. A Coastal Seawater Temperature Dataset for Biogeographical Studies: Large Biases between In Situ and Remotely-Sensed Data Sets around the Coast of South Africa. *PLOS ONE* 8(12), pp. e81944 – e81944.
- SMITH, G.F. & FIGUEIREDO, E.** 2013. Notes on the nomenclature of species of Agave L. (Agavaceae/Asparagaceae) grown in and described from European gardens and nurseries. *Bradleya* 31, pp. 53 – 57.
- SMITH, G.F. & FIGUEIREDO, E.** 2013. The family Crassulaceae in continental Portugal. *Bradleya* 31, pp. 76 – 88.
- SMITH, G.F. & FIGUEIREDO, E.** 2013. Type specimens online: What is available, what is not, and how to proceed; Reflections based on an analysis of the images of type specimens of southern African Polygala (Polygalaceae) accessible on the worldwide web. *Taxon* 62(4), pp. 801 – 806.
- SMITH, G.F. & FIGUEIREDO, E.** 2013. Names associated with Aloe speciosa Baker (Asphodelaceae), a common species in the Western and Eastern Cape Provinces of South Africa. *Bradleya* 31, pp. 139 – 141.
- SMITH, G.F.; KLOPPER, R.R.; FIGUEIREDO, E.; CROUCH, N.R. & BARKWORTH, M.E.** 2013. A note on four historical names recorded in Aloe L. Asphodelaceae: Alooidae. *Bradleya* 31, pp. 128 – 132.
- SPIES, L.; KOEKEMOER, T.C.; SOWEMIMO, A.A.; GOOSEN, E.D. & VAN DE VENTER, M.** 2013. Caspase-dependent apoptosis is induced by Artemisia afra Jacq. Ex Willd in a mitochondria-dependent manner after G2/M arrest. *South African Journal of Botany* 84, pp. 104 – 109.
- STANKIEWICZ, J. & DE WIT, M.** 2013. 3.5 billion years of reshaped Moho, southern Africa. *Tectonophysics* 609, pp. 675 – 689.
- SUTHERLAND, K.; WOOLDRIDGE, T.H. & STRYDOM, N.A.** 2013. Composition, abundance, distribution and seasonality of zooplankton in the Sundays Estuary, South Africa. *African Journal of Aquatic Science* 38(1), pp. 79 – 92.
- TABOT, P.T. & ADAMS, J.B.** 2013. Responses of the Salt Marsh Succulent *Bassia diffusa* (Thunb.) Kuntze to Salinity and Inundation. *Wetlands* 33(5), pp. 787 – 797.
- TABOT, P.T. & ADAMS, J.B.** 2013. Ecophysiology of salt marsh plants and predicted responses to climate change in South Africa. *Ocean & Coastal Management* 80, pp. 89 – 99.
- TAMBLING, C.J.; FERREIRA, S.M.; ADENDORFF, J. & KERLEY, G.I.H.** 2013. Lessons from management interventions: consequences for lion-buffalo interactions. *South African Journal of Wildlife Research* 43(1), pp. 1 – 11.
- THYSE, E.I.; AKDOGAN, G.; OLIVIER, E.J.; O'CONNELL, J.H.; NEETHLING, J.H.; TASKINEN, P. & EKSTEEN, J.J.** 2013. 3D insights into nickel converter matte phases: Direct observations via TEM and FIB SEM tomography. *Minerals Engineering* 52, pp. 2 – 7.

- TODARO, M.A.; PERISSINOTTO, R. & BOWNES, S.J.** 2013. Neogosseidae (Gastrotricha, Chaetonotida) from the iSimangaliso Wetland Park, KwaZulu-Natal, South Africa. *ZooKeys* 315, pp. 77 – 94.
- TOWNER, A.V.; UNDERHILL, L.C.; JEWELL, O.J.D. & SMALE, M.J.** 2013. Environmental Influences on the Abundance and Sexual Composition of White Sharks *Carcharodon carcharias* in Gansbaai, South Africa. *PLOS* 8(8), pp. 1 – 11.
- URGESSA, Z.N.; TALLA, K.; DOBSON, S.T.; OLUWAFEMI, O.S.; OLIVIER, E.J.; NEETHLING, J.H. & BOTHA, J.R.** 2013. Mechanisms of self-assembly in solution grown ZnO nanorods. *Materials Letters* 108, pp. 280 – 284.
- URGESSA, Z.A.; OLUWAFEMI, O.S.; OLIVIER, E.J.; NEETHLING, J.H. & BOTHA, J.R.** 2013. Synthesis of well-aligned ZnO nanorods on silicon substrate at lower temperature. *Journal of Alloys and Compounds* 580, pp. 120 – 124.
- VAN DE VEN, T.M.F.N.; MZILIKAZI, N. & McKECHNIE, A.E.** 2013. Seasonal Metabolic Variation in Two Populations of an Afrotropical Euplectid Bird. *Physiological and Biochemical Zoology* 86(1), pp. 19 – 26.
- VAN DE VEN, T.M.F.N.; MZILIKAZI, N. & McKECHNIE, A.E.** 2013. Phenotypic flexibility in body mass, basal metabolic rate and summit metabolism in southern red bishops (*Euplectes orix*): Responses to short term thermal acclimation. *Comparative Biochemistry and Physiology: Part A* 165(3), pp. 319 – 327.
- VAN DE VEN, T.M.F.N.; TAMBLING, C.J. & KERLEY, G.I.H.** 2013. Seasonal diet of black-backed jackal in the Eastern Karoo, South Africa. *Journal of Arid Environments* 99, pp. 23 – 27.
- VAN DE VYVER, M.L.; COWLING, R.M.; MILLS, A.J. & DIFFORD, M.** 2013. Spontaneous Return of Biodiversity in Restored Subtropical Thicket: *Portulacaria afra* as an Ecosystem Engineer. *Restoration Ecology* 21(6), pp. 736 – 744.
- VAN LUIJK, G.; COWLING, R.M.; RIKSEN, M.J.P.M. & GLENDAY, J.** 2013. Hydrological implications of desertification: Degradation of South African semi-arid subtropical thicket. *Journal of Arid Environments* 91, pp. 14 – 21.
- VAN NIEKERK, L.; ADAMS, J.B.; BATE, G.C.; FORBES, A.T.; FORBES, N.T.; HUIZINGA, P.; LAMBERTH, S.J.; MACKAY, C.F.; PETERSEN, C.; TALJAARD, S.; WEERTS, S.P.; WHITFIELD, A.K. & WOOLDRIDGE, T.H.** 2013. Country-wide assessment of estuary health: An approach for integrating pressures and ecosystem response in a data limited environment. *Estuarine, Coastal and Shelf Science* 130, pp. 239 – 251.
- VAN NIEKERK, E.J. & VAN NIEKERK, P.duP.** 2013. Conscious Leadership: A Conceptual Framework of Elements for Short-Term and Long-Term Effectiveness. *Mediterranean Journal of Social Sciences* 4(13), pp. 283 – 292.
- VENABLES, L.; GOVENDER, S. & OOSTHUIZEN, V.** 2013. Heterologous expression and purification of biologically active domains 3 and 4 human polymeric immunoglobulin receptor and its interaction with choline binding protein A of *Streptococcus pneumoniae*. *Protein Expression and Purification* 91(2), pp. 207 – 214.
- VON MALTITZ, & SETZKORN, K.** 2013. A typology of Southern African biofuel feedstock production projects. *SciVerse ScienceDirect* 59, pp. 33 – 49.
- VROMANS, D.C.; ADAMS, J.B. & RIDDEN, T.** 2013. The phenology of *Ruppia cirrhosa* (Petagna) Grande and *Chara* sp. In a small temporarily open/closed estuary, South Africa. *Aquatic Botany* 110, pp. 1 – 5.
- WAGENER, M.C.; CARRINGTON, P.J.; BOTHA, J.R. & KRIER, A.** 2013. Simulation of the enhanced infrared photoresponse of type-II GaSb/GaAs quantum ring solar cells. *Applied Physics Letters* 103(6), pp. 063902 – 1 – 063902 – 4.
- WATT-PRINGLE, P.A.; COWLEY, P.D. & GÖTZ, A.** 2013. Residency and small-scale movement, behaviour of three endemic sparid fishes in their shallow rocky subtidal nursery habitat, South Africa. *African Zoology* 48(1), pp. 30 – 38.
- WEBB, N.** 2013. “Works” twice subverted: An explication of Ephesians 2:9,101. *South African Baptist Journal of Theology* 22, pp. 70 – 79.
- WILHELM-RECHMANN, A.; COWLING, R.M. & DIFFORD, M.** 2013. Using social marketing concepts to promote the integration of systematic conservation plans in land-use planning in South Africa. *Oryx* 48(1), pp. 71 – 79.
- WILHELM-RECHMANN, A. & COWLING, R.M.** 2013. Local land-use planning and the role of conservation: An example analysing opportunities. *South African Journal of Science* 109(3/4), pp. 1 – 6.
- WILLIAMS-BRUIJNDERS, L.** 2013. Making spaces or building places? a look at social sustainability in low cost housing, Port Elizabeth, South Africa. *Environmental Economics* 4(3), pp. 51 – 58.
- WHITFIELD, A.K.; BATE, G.C.; FORBES, T. & TAYLOR, R.H.** 2013. Relinkage of the Mfolozi River to the St. Lucia estuarine system - urgent imperative for the long-term management of a Ramsar and World Heritage Site. *Aquatic Ecosystem Health & Management* 16(1), pp. 104 – 110.
- YAMUNA, T.S.; YATHIRAJAN, H.S.; RAMAKRISHNA, R.A.; GERBER, T.; HOSTEN, E. & BETZ, R.** 2013. Redetermination of the structure of N-(2-benzoyl-4-chlorophenyl)-2-chloroacetamide, C₁₅H₁₁Cl₂N₂O₂. *Zeitschrift für Kristallografie – New Crystal Structures* 228, pp. 293 – 294.

Book submitted to DHET for subsidy purposes

BOSHOFF, A.F. & KERLEY, G.I.H. 2013. *Historical incidence of the larger mammals in the Free State (South Africa) and Lesotho*. Nelson Mandela Metropolitan University: Port Elizabeth, South Africa.

Book Chapters submitted to DHET for subsidy purposes

ADAMS, J.; NONDODA, S. & TAYLOR, R. 2013. Macrophytes in: PERISSINOTTO, R.; STRETCH, D. & TAYLOR, R. (Eds). *Ecology and Conservation of Estuarine Ecosystems: Lake St Lucia as a Global Model*. Cambridge University Press, New York, USA.

BROWN, K.; O'NEILL, S. & FABRICIUS, C. 2013. Social science understandings of transformation. *World Social Science Report 2013, Changing Global Environments*. OECD and UNESCO Publishing, Paris.

KAKEMBO, V. 2013. Land disturbance, vegetation invasions and implications for land degradation in: DANIELS, J.A. (Ed). *Advances in environment research*. Volume 29. Nova Science, New York, USA.

KAKEMBO, V.; MAMFENGU, P. & KERLEY, G. 2013. Communal Game Farming: A sustainable land use option? In: SMITH, J. (Eds). *National Parks: Sustainable development, conservation strategies and environmental impacts*. Nova Science, New York, USA.

MIRANDA, N. & ADAMS, J. 2013. Alien and invasive species in: PERISSINOTTO, R.; STRETCH, D. & TAYLOR, R. (Eds). *Ecology and Conservation of Estuarine Ecosystems: Lake St Lucia as a Global Model*. Cambridge University Press, New York, USA.

PERISSINOTTO, R.; BATE, G.C. & MUIR, D.G. 2013. Microalgae in: PERISSINOTTO, R.; STRETCH, D. & TAYLOR, R. (Eds). *Ecology and Conservation of Estuarine Ecosystems: Lake St Lucia as a Global Model*. Cambridge University Press, New York, USA.

Conference Proceedings submitted to DHET for subsidy purposes

BARNARD, L. & KAMUHANDA, D. Social network learning support for under-graduate programming students. *Proceedings of the 15th Annual Conference on World Wide Web Applications*: Cape Town, South Africa, 10 – 13 September 2013.

BEETS, S. & WESSON, J. Designing a tool to support the interactive visualisation of personal information across multiple devices. *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

BEETS, S. & WESSON, J. Managing personal information across multiple devices: Challenges and opportunities. *Fourteenth IFIP TC 13 International Conference*: Cape Town, South Africa, 02 – 06 September 2013.

BURGER, C.; DU PLESSIS, M.C. & CILLIERS, C. Design and parametric considerations for artificial neural network pruning in UCT game playing. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists*: East London, South Africa, 07 – 09 October 2013.

CALITZ, A.; CULLEN, M. & SCHARNECK, J. A framework for the governance of social media in the workplace. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

CILLIERS, C.; BARNARD, L.; HIBBERS, T. & KOORSSE, M. MIDD- An architecture for inter-domain mobile content distribution. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists*: East London, South Africa, 07 – 09 October 2013.

CONNOLLEY, A.; SCHOLTZ, B. & CALITZ, A. Achieving the benefits of business-IT alignment supported by enterprise architecture. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

DITTA, M.; WESSON, J. & COWLEY, L. CollaGIM: Supporting group information management on a multi-touch surface. *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

FOSTER, R.S. The development of the South African eHealth strategy assessed against the recommendations of the WHO/ITU eHealth Strategy Toolkit. *Health Informatics South Africa*: Port Elizabeth, South Africa, 03 July 2013.

ISOE, G.; WASWA, D.; MUGURO, K. & LEITCH, A. Effects of double Rayleigh scattering in fibre raman amplifier at different pump configurations. *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

KENNEDY, J. & WESSON, J. Accessing personal information across multiple remote devices. *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

KOUROUMA, H.Y.S.; ROTICH-KIPNOO, E.K.; GAMATHAM, R.R.G.; LEITCH, A.W.R. & GIBBON, T.B. Phase instabilities of a reference signal for timing and frequency distribution of the Square Kilometre Array (SKA). *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

MATTHEWS, T.; VOGTS, D. & NAUDE, K. Sketch-based interfaces: Drawings to data. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists*: East London, South Africa, 07 – 09 October 2013.

MUKANDATSAMA, C. & WESSON, J. Designing a mobile pill reminder for elderly uses in South Africa. *Health Informatics South Africa*: Port Elizabeth, South Africa, 03 July 2013.

MWANZA, P.; DEALTRY, G.B.; LEE, M.E. & MOORE, S. The effect of ultra violet radiation on the plant biopesticide, *Cryptophlebia Leucotreta* granulovirus. *Fifty-first Annual Conference of the Microscopy Society of Southern Africa*: Pretoria, South Africa, 03 – 06 December 2013.

NTAWANGA, F.; CALITZ, A. & BARNARD, L. An integrated logical context sensor for mobile web applications. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists*: East London, South Africa, 07 – 09 October 2013.

ROTICH-KIPNOO, E.K.; KOUROUMA, H.Y.S.; CHABATA, T.V.; GAMATHAM, R.R.G.; LEITCH, A.W.R. & GIBBON, T. Optimizing VCSEL transmission for longer reach in optical access networks. *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

SCHOLTZ, B.; BURGER, C. & GCAKASI, M. Evaluating visualisation tools for balanced scorecards. *Proceedings of the first Enterprise Systems Conference*: Cape Town, South Africa, 07 – 08 November 2013.

SCHOLTZ, B.; CALITZ, A. & MUDAU, N. Success factors for ERP implementations involving managerial accounting. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

SCHOLTZ, B.; CALITZ, A. & SNYMAN, I. The usability of collaborative tools: Application to business process modelling. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists*: East London, South Africa, 07 – 09 October 2013.

SCHOLTZ, B.; CALITZ, A.; CONNOLLEY, A. An analysis of the adoption and usage of enterprise architecture. *Proceedings of the first Enterprise Systems Conference*: Cape Town, South Africa, 07 – 08 November 2013.

SCHOLTZ, B.; CILLIERS, C. & FERREIRA, C. The ATDM methodology to support the design and implementation of an enterprise data warehouse. *Proceedings of the first Enterprise Systems Conference*: Cape Town, South Africa, 07 – 08 November 2013.

SCHUSTER, C.; HALBERSTADT, J. & BURGER, C. Methodological trends and challenges of entrepreneurship research. *Seventh International Business Conference*: Seychelles, 02 – 05 September 2013.

SWANEPOEL, J.; VOGTS, D. & WESSON, J. Using proxemic interaction to support co-located group information management. *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

TCHANKUE, P.; WESSON, J. & VOGTS, D. Using machine learning to predict the driving context whilst driving. *Proceedings of the Annual Conference of the SA Institute for Computer Scientists and Information Technologists*: East London, South Africa, 07 – 09 October 2013.

WASSIN, S.; ROTICH-KIPNOO, E.K.; GAMATHAM, R.R.G.; LEITCH, A.W.R. & GIBBON, T.B. Chromatic dispersion measurements of optical fibre using the Pulse Delay Technique. *Southern Africa Telecommunication Networks and Applications Conference*: Stellenbosch, South Africa, 01 – 04 September 2013.

■ Support Services

DHET Accredited Journal Articles

FANA, T.; MAYEKISO, T. & GWANDURE, C. 2013. An Assessment of Community Members' Knowledge of Drug-resistant Tuberculosis and HIV and AIDS in the Eastern Cape Province, South Africa. *Africa Insight* 43(2), pp. 58 – 73.

GWANDURE, C. & MAYEKISO, T. 2013. Psychological Contract in HIV Prevention Clinical Trials in Resource Poor Communities in Africa. *Journal of Psychology in Africa* 23(1), pp. 165 – 169.

GWANDURE, C. & MAYEKISO, T. 2013. Medical Injury Compensation Complications in New HIV Prevention Technologies in Africa. *Journal of Human Ecology* 42(2), pp. 95 – 101.

GWANDURE, C. & MAYEKISO, T. 2013. Promoting children's public participation in policy-making through achievement-orientated education. *Africa Education Review* 10(3), pp. 520 – 538.

GWANDURE, C. & MAYEKISO, T. 2013. The Impact of Dwindling Donor Funding on HIV and AIDS Projects in Sub-Saharan Africa. *Africa Insight* 42(4), pp. 44 – 58.

KALENGA, R.C.; CHIKOKO, V. & KHANARE, F. 2013. Leadership practices among the Lamba people of Zambia: Some implications for school leadership. *INDILINGA* 12(2), pp. 231 – 241.

MACDONALD, D.; CRONIN, J.; MILLS, J.; MCGUIGAN, M. & STRETCH, R. 2013. A review of cricket fielding requirements. *South African Journal of Sports Medicine* 25(3), pp. 87 – 92.

MAYEKISO, T. ; TAYLOR, D. & MAPHAZI, N. 2013. A Public Participation Model for Enhanced Local Governance. *Africa Insight* 42(2), pp. 186 – 199.

MILILO, S.; GWANDURE, C. & MAYEKISO, T. 2013. Perceptions of organisational incentive schemes and continuance commitment in talent management among final year university students. *Journal of Public Administration* 48(4.1), pp. 843 – 866.

MKONTWANA, P.; STEENKAMP, L. & VON DER MARWITZ, J. 2013. Challenges in the implementation of the Infant and Young Child Feeding policy to prevent mother-to-child transmission of human immunodeficiency virus in the Nelson Mandela Bay District. *South African Journal of Clinical Nutrition* 26(2), pp. 25 – 32.

NAUDÉ, P.J. 2013. Am I my brother's keeper? An African reflection on humanisation. *Nederduitse Gereformeerde Teologiese Tydskrif* 54(5), pp. 241 – 253.

NEL, H. & NEALE-SHUTTE, M. 2013. Examining evidence: Graduate employability at NMMU. *South African Journal of Higher Education* 27(2), pp. 437 – 453.

PAUL, G. & BERRY, B.M. (Berry, B.M. - Post humous). 2013. The importance of executive leadership in creating a post-merged organisational culture conducive to effective performance management. *Journal of Human Resource Management* 11(1), pp. 14 – 28.

PELTZER, K. & PHASWANA-MAFUYA, N. 2013. Depression and associated factors in older adults in South Africa. *Global Health Action* 6, pp. 1 – 9.

PELTZER, K.; HABIL, D.R. & PHASWANA-MAFUYA. 2013. Hypertension and associated factors in older adults in South Africa. *Cardiovascular Journal of Africa* 24(3), pp. 59 – 64.

PELTZER, K. & PHASWANA-MAFUYA, N. 2013. Arthritis and associated factors in older adults in South Africa. *Turkish Journal of Geriatrics* 16(4), pp. 389 – 394.

PELTZER, K. & PHASWANA-MAFUYA, N. 2013. Problem drinking and associated factors in older adults in South Africa. *African Journal of Psychiatry* 16(2), pp. 104 – 109.

PHASWANA-MAFUYA, N.; PELTZER, K.; RAMLAGAN, M.S.; CHIRINDA, W. & KOSE, Z. 2013. Social and health determinants of gender differences in disability amongst older adults in South Africa. *Health SA Gesondheid* 18(1), pp. 1 – 9.

PHASWANA-MAFUYA, N.; PELTZER, K.; CHIRINDA, W.; MUSEKIWA, A.; KOSE, Z.; HOOSAIN, E.; DAVIDS, A. & RAMLAGAN, S. 2012. Self-reported prevalence of chronic non-communicable diseases and associated factors among older adults in South Africa. *Global Health Action* 6, pp. 1 – 7.

PHASWANA-MAFUYA, N.; PELTZER, K.; CHIRINDA, W.; KOSE, Z.; HOOSAIN, E.; RAMLAGAN, S.; TABANE, C. & DAVIDS, A. 2013. Self-rated health and associated factors among older South Africans: evidence from the study on global ageing and adult health. *Global Health Action* 6, pp. 1 – 10.

RAMLAGAN, S.; PELTZER, K. & PHASWANA-MAFUYA, N. 2013. Social capital and health among older adults in South Africa. *BMC Geriatrics* 13(100), pp. 1 – 11.

STEENKAMP, L. & LATEGAN, R. 2013. The acceptability and intake of lipid-based pastes as a food supplement in a South African context. *South African Journal of Clinical Nutrition* 26(3), pp. 150 – 151.

WEIMERS, J.; GWANDURE, C. & MAYEKISO, T. 2013. The impact of mentoring on leadership behavior. *Journal of Public Administration* 48(4.1), pp. 796 – 810.

Chapters in Books submitted to DHET for subsidy purpose

MEKOA, I. 2013. Re-inventing an African university in South Africa: Challenges and prospects in: DE WET, G. (Ed). *Beyond the Apartheid University: critical voices on transformation in the university sector*. University of Fort Hare Press, Alice, South Africa.

ZINN, A. & LAWRENCE, L. 2013. From project to programme: The Imbewu journey in transformation in: SAYED, Y.; KANJEE, A & NKOMO, M. (Eds). *The search for quality education in post-apartheid South Africa*. HSRC Press, Cape Town, South Africa.

Conference Proceeding submitted to DHET for subsidy purposes

BOMELA, N. Factors associated with under-five mortality in South Africa. Trends 1997 – 2002. *World Academy of Science, Engineering and Technology*: Paris, France, 27 – 28 June 2013.

Research Support

Department of Research Management

The Department of Research Management (RM) focuses mainly on the needs of established researchers. It manages:

- All NRF grants, excluding Thuthuka and student bursaries.
- The Technology and Human Resources for Industry Programme (THRIP).
- The development of an in-house research information system, RIMS, and the roll out of the national DST/NRF supported Info EdRIMS.
- The submission of applications for NRF rating.
- The registration and activity reporting of research institutes, centres and units.
- The submission of publication research output subsidy claims to the Department of Higher Education and Training (DHET).
- The development and implementation of various categories of research incentives.
- Applications for research leave and research sabbaticals via the NMMU Research Committee, which is chaired by the Director of RM.
- All external research grants aimed at established researchers.
- Internal support such as the Transformation and Equity Research Grants (TERG) and the Research Theme Grants (RTG).
- The Unit for Statistical Consultation (USC), which renders a free statistical consultation service to staff, as well as postgraduate students.
- The identification and nomination of staff for external research awards.
- The DST/NRF Research Chairs.
- The Researcher of the Year Awards.
- Internal and external research surveys.
- Research partnerships.
- Monitoring various research activities on behalf of the Deputy Vice-Chancellor: Research and Engagement and the NMMU.
- Research, Technology and Innovation (RTI) Committee.
- Advises the Capital Resource Allocation Committee (CRAC) on the allocation of research equipment, and
- Individual research accounts in close cooperation with NMMU's Finance Department.

Department of Research Capacity Development

The Department of Research Capacity Development (RCD) focuses mainly on the needs of emerging researchers and postgraduate students. Its core functions are:

- Managing institutional and external funding support for postgraduate students.
- Facilitating initiatives to expand the levels of accredited research outputs by emerging researchers.
- Improving the academic staff qualification profile.
- Assuming responsibility for institutional research capacity development programmes/interventions.

- Providing mentorship to developing research staff and postgraduate students.
- Harnessing the research contribution of research associates, and
- Managing the NMMU Research Ethics Committees (Animal and Human).

Department of Innovation Support and Technology Transfer

The Department of Innovation Support and Technology Transfer (IS&TT) undertakes the following activities:

- Technology transfer activities, which encompass the protection, management and commercialisation of NMMU's Intellectual Property (IP) such as:
 - Development of patenting/protection strategy.
 - Development of commercialisation strategy.
 - New company creation and protection of NMMU's interests, and
 - License agreements.
- Innovation Support for external research-related activities such as facilitating collaborations and contracts, proposal writing, access to funding, including:
 - Presence on Advisory Boards of research entities with commercial activities.
 - Contract development and negotiation.
 - Management of Innovation Award scheme, and
 - Implementation of Technology Transfer and Proposal Tracking modules in InfoEd.
- Other innovation activities at local, provincial and national level such as:
 - Running the National Innovation Competition at NMMU.
 - Guiding the Regional Technology Transfer Office anchored at NMMU.
 - Driving the creation of a regional innovation forum, and
 - Development of the business case for the creation of a Research Park at NMMU.

Finance Department

The Department of Finance has created a section (comprising three staff members) whose primary function it is to focus on research-related financial matters.

The Unit for Statistical Consultation

The Unit for Statistical Consultation (USC) renders a free statistical consultation service to staff as well as Masters and Doctoral students engaged in academic research. In 2013, a total of 196 students and staff members made use of this service.

Research Funding Database

NMMU subscribes to Research Africa, a funding database that is available to all staff and postgraduate students. Research Africa allows researchers to search for funding opportunities in specific areas of interest and to set up e-mail alerts when calls for proposals are made.

Research Websites

The Departments of Research Management (RM), Research Capacity Development (RCD) and Innovation Support and Technology Transfer (IS & TT) have designed their own websites aimed at providing online access to information and services offered. These can be accessed at: www.nmmu.ac.za.

Research Management Information Systems

The InfoEd national Research Information Management System (RIMS) allows the Research Office to capture a wide range of research data that can easily be extracted and allows for trends to be identified and strategies to be developed to further enhance research capacity and quality. For example, it allows individual research profiles to be extracted, along with CVs of researchers and specific faculty or department outputs. Other capabilities include tracking and developing proposals, assisting with research ethics approval and identifying research funding opportunities via Sponsored Programs Information Network (SPIN). During 2012, the following InfoEd modules were used or are in the process of being rolled out: Research Output Module (ROM) and Ethics (Human).

An in-house information system has also been developed. This system, referred to as Research Master File, compiles various valuable pieces of data into an informative view of research activity by the researcher, in terms of research output that can be subsidised and main streams of funding. This archive of pertinent research data can provide valuable assistance to stakeholders of various levels to evaluate performance of individuals and faculties.

NMMU Library and Information Services as Research Library / Research Space

The Research Philosophy of the Library and Information Services and Support for Research at NMMU

The NMMU Library and Information Services have committed itself to establish service-oriented, technology-enhanced learner support services to increase retention and throughput. The Summerstrand South Campus Library has much improved facilities to support research in terms of special collections areas, reading rooms and electronic research facilities.

To give effect to NMMU Vision 2020, the Library Directorate has formulated a concept of service development in conjunction with the relevant service divisions that includes the development of walk-in and remote branch services and the development of research services. The development of aspects of research services such as research information materials, expert library assistance to research will be developed by Library Information Services and Digital Applications (LISDA), Bibliographic Services and Library Circulation Services respectively.

Planning for development of NMMU Library and Information Services as research library in conjunction with the academic community, university structures and departments, will be undertaken. In adherence to the University's relevant Strategic and Operational plans as spelled out in the NMMU Vision 2020:

In Accordance with the NMMU Vision 2020:

LIS STRATEGIC PRIORITY: RESOURCES AND ACCESS

LIS STRATEGIC GOAL: Information Resources and Collection Development
Continue to acquire, provide and maintain access to high quality, relevant print and electronic information resources and collections that are appropriate for the support of the NMMU's teaching, learning and research and innovative mission and programmes (curricula).

LIS STRATEGIC PRIORITY: TEACHING, LEARNING AND RESEARCH SUPPORT

Provide high quality seamless user-centred, equitable services to users; to support NMMU's teaching, learning and research goals.

LIS STRATEGIC GOAL: Strengthen and consolidate e-Strategies for e-Services, e-Processes, e-Access, e-Learning, e-Research, Hybrid collections, e-Skills, and Digitisation.

LIS STRATEGIC GOAL: Information literacy

Provide all bona fide users with the opportunity to acquire information literacy skills.

LIS STRATEGIC GOAL: Service Culture

Provide user centred services.

Support Services

The NMMU LIS provides a full set of library service in accordance with Services Delivery Model (SDM). The service focus of NMMU LIS is on providing services to the Research Community and to develop and present research related services and events.

The NMMU Library and Information Services provide the following services:

- Special collections made more accessible in controlled reading areas.
- Hybrid Collection.
- Complement and enhance p-Resources with e-Resources to provide a hybrid collection, and
- General information, print materials circulation, photocopying and other general library services with a research user-focus.

LIS STRATEGIC GOAL: Infrastructure and Environment

Continue to upgrade and modernise locations to become more accommodating and conducive to teaching, learning, research, and innovation.

(Suitable reading and research spaces for researchers and reconfiguration of existing space to accommodate new services and technologies, e.g. for student collaborative work, individual study areas):

- The NMMU Library and Information Services embarked on the establishment of the “Commons Projects” to fulfil part of Vision 2020 and the E-strategy of the University and the LIS.
- Vision 2020 Strategic Goal 4: Ensure a quality educational environment through the effective use of technology in the areas of ICT, Media and Library Services. Develop and implement an institutional strategy for the effective provision of electronic library and information services to enhance teaching, learning and research.
- Purpose designed Workstations at all Branch Libraries where Librarians can provide services and assistance to the Users of the Library (by definition research Users).

E-Learning

- Develop and implement electronic/ blended learning to allow Library users optimal benefit from accessible /available information resources.
- Provide training material at Learn@NMMU and LIS/Faculty Librarian websites.
- Electronic Theses and Dissertations Repository with NMMU research output.
- Electronic services and tools.
- Access to Electronic information resources.
- Virtual librarian services.
- Utilise social networking tools.
- End Note Training, and
- InCites Training.

Training and Unmediated Services

- Electronic training facilities to promote information literacy among researchers WiFi services throughout the various libraries (to enable laptop users to access electronic library services and resources) will be provided.

Research support focused role of the Faculty Librarian: Liaison Services

- Conduct complex searches
- Users Training
- Alerting Services
- Tuition Support
- Plagiarism (training on Turnitin), and
- Copyright (advice on copyright issues)

The following tools and resources are and will also be provided:

- Access to electronic information resources
- Unmediated service, and
- Virtual training materials

Editor

Prof Thoko Mayekiso

Deputy Vice-Chancellor: Research and Engagement

Project Team

Ms Nicola Taylor

Dr Pieter van Breda

Dr Nolunkwe Bomela

Photography

Leonette Bower & NDP Video Productions

Front Cover Photograph: Prof Russell Phillips & Mr Etienne Phillips

Layout and Publishing

i am.com

Contact Details

Ms Nicola Taylor

nicola.taylor@nmmu.ac.za

Tel: 041 504 4536

Department of Research Management

P.O. Box 77000

Nelson Mandela Metropolitan University

Port Elizabeth

6031

South Africa

© NMMU 2013 Research and Innovation Report

ISBN No. 978-1-920508-44-9



P.O. Box 77000
Nelson Mandela Metropolitan University
Port Elizabeth
6031
South Africa
www.nmmu.ac.za